**From:** Skone, Timothy
**Sent:** Wed, 24 May 2023 17:15:06 +0000
**To:** Jamieson, Matthew B.; Blackhurst, Michael (NETL)
**Cc:** Matthews, Howard Scott (CONTR); Michael Blackhurst; Whiston, Michael M (NETL); Curry, Thomas
**Subject:** RE: LNG Analysis
**Attachments:** EY22_23 LNG Analysis FWP 1025016_20230112_Update 1.docx

Mike and NETL Team,

Yesterday you asked for more detail (steps) on how to create the LNG consequential adder and the interaction between GCAM and NETL work. Please note, the steps below are focused only on the GCAM aspect. There are NEMS runs that will provide domestic detail by production basin and export location. This is not outlined below but is part of the effort when creating the LCA profile for domestic gas production, use, and export.

**Step 1** – Map the GCAM data files to track the technosphere flows from energy production, transport, industrial sub use (if relevant), transport to end use, and use of the energy carrier. This needs to be tracked at the regional level of GCAM representativeness.

**Step 2** – Subtract S(n) from S1 to determine change in US LNG exports. [n = scenario 1 thru 6 iterations] This will provide a relationship in 5-year time increments for the change in US LNG exports (per 5 year time step).

**Step 3** – Subtract S(n) from S1 to determine change energy consumption magnitude by sector and technology for same 5-year time increments as Step 2.

**Step 4** – Divide Step 3 by Step 2 (for the same 5-year increment and S(n)-S1 pairing. This will create the "technosphere flow consequential adder" specific to each scenario pairing and provide a market consequence depending on the current LNG export base volume (volume of US LNG export activity at the start year of the 5-year time step) and the increment of change in US LNG export volume (over the 5 -year times step).

Note: We need to determine if the base amount of export volume is important or only the incremental change in export volume when evaluating market consequences. The answer will also vary based on the Scenario pairing. These have been designed within the project to "bracket" a range of incremental increases in export volume; High, Medium, Low.

**Step 5** – Using the GCAM technosphere values, replace the GCAM emission factors for energy (specifically/especially: natural gas/LNG) supply chain stages and energy end use to provide a life cycle perspective. How to prioritize what gets replaced? The scope of work lists the resources that NETL will use to assess post processing replacement of emission estimates for the GCAM technosphere flows. Caution is required to ensure/prevent double counting. We can use US data as a proxy for international operations if we determine an improvement in consistency, comparability, and maybe accuracy (this is subjective at this state). The following are NETL SOW excerpts relevant to Step5:

- NETL will use the data to identify the production-to-consumption LNG pathways predicted by the economic equilibrium model. These pathways and their respective flows of natural gas will be used as inputs to the LCA. NETL will develop production-

weighted average life cycle greenhouse emission factors for each production region, transportation mode and route, end-use sector, and end-use region and then apply these average factors to estimate the total emissions associated with each economic equilibrium scenario.

- Life cycle models will include all natural gas processes, starting with source extraction and extending to end-use combustion. NETL will provide emission comparisons for alternative primary energy source scenarios or energy sources estimated as displaced by natural gas as a result of the economic equilibrium modeling using existing NETL lifecycle-based data and/or global modeling proxy data. The lifecycle-based models for alternative energy supplies and consumption, similar to natural gas and LNG pathways, data will not be representative of country specific performance parameters. NETL will use existing U.S. data and models as proxies where commensurate data and models for foreign operations are missing.
- NETL will use the following primary models:
    - NETL Natural Gas Baseline Model (2020 update to be completed in winter 2022)
    - 2019 LNG GHG Study
    - Alaska LNG Draft Supplemental Environmental Impact Statement (SEIS)
    - NETL U.S. Electricity Baseline Model (2020 update of thermal electric and renewable energy production pathways)
    - NETL Biomass and Renewable Natural Gas (RNG) Production Models (updated in 2022, as needed)
    - NETL Fossil Hydrogen Baseline Report
    - NETL Hydrogen and Water Analysis
    - NETL Unit Process Library and other LCA Resources, www.netl.doe.gov/LCA
- NETL will use the above models to develop packaged cradle-to-gate, gate-to-gate, and gate-to-grave unit process models to create GHG emission profiles for the applicable material and energy reference flows (technosphere flows of interest). The aggregated emission scalers will then be combined with scenario output data provided by ORS to determine the annual or 5 year time period GHG inventory data. End use emission factors will be applied to represent each economic sector's weighted average use of the delivered energy. The inventory data for each scenario will then be used to calculate the GWP and SCC results for each scenario.
- NETL will estimate model sensitivity to expected future technological change in the natural gas system.

**Step 6** – Create a "emissions consequential adder" based on the technospere flow data from GCAM, NETL LCA data (and GCAM emissions data for data not replaced with NETL emission factors). This will improve consistency for "adding" the consequential adder to the NETL attributional LCA model for LNG exports (Task 3.2 in the NETL scope of work).

**Step 7** –Documentation and reporting of LCA Results; scope excerpts related to this step:

- NETL will use existing life cycle modeling resources for energy supply and consumption (use) emission factors to estimate GHG intensity changes across modeled scenarios.
- The outcome of the consequential informed life cycle GHG results will report the change in terms of Global Warming Potential (GWP) based on the most recent Intergovernmental Panel on Climate Change report (the Sixth Assessment Report) for 20 and 100 year time frames for each scenario. The results will also be reported in terms of

social cost of carbon (SCC) based on the most current U.S. guidance provided by ORS to NETL.

- NETL will provide a written report documenting the comparative findings of the LCA results for ORS use in developing the broader project level report. LCA results for all scenarios will be provided in Microsoft Excel.
- Methods/approach, data sources, and data limitations will be included in the written report along with a discussion of the study results.
- Methods/approach, data sources, and data limitations will be included in the written report along with a discussion of the study results.
- NETL will estimate model sensitivity to expected future technological change in the natural gas system.
- Uncertainty modeling is not included in this effort.
- The outcomes of the consequential LCA will be: (1) estimated unit life cycle emissions factor associated with major supply-to-consumption pathways expected from LNG imports, exports, and re-exports; (2) average total life cycle emissions associated with the range of global economic, policy, and security postures represented by the equilibrium models; and (3) improved empirical basis for emissions driven by the inclusion of the modeling of upstream processes involved in supplying, transporting, and consuming LNG.

Let me know if this helpful or adds confusion to the discussion.

Respectfully,

Tim Skone

-----Original Appointment-----
**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Monday, May 22, 2023 11:14 AM
**To:** Jamieson, Matthew B.; Blackhurst, Michael (NETL); Skone, Timothy
**Cc:** Matthews, Howard Scott (CONTR); Michael Blackhurst; Whiston, Michael M (NETL)
**Subject:** LNG Analysis
**When:** Tuesday, May 23, 2023 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).
**Where:** Microsoft Teams Meeting

Michael, please let me know if this time doesn't work for you. Was just going off NETL calendar.

Point is just to continue the conversation a bit from the LNG meeting we had today, ahead of the next conversation with GCAM team.

---

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*LNG Regulatory Analysis Support FWP*
*FWP Number: 1025016*

*EY22/23 Field Work Proposal*
*Submitted: January 12, 2023*
*Updated: February 16, 2023*

# Liquefied Natural Gas (LNG) Regulatory Analysis Support EY22/23 Field Work Proposal (FWP)

## FWP Summary Budget Table

| Task | Task Title | Period of Performance | Draft Deliverable | Hours | Funding ($k) |
|---|---|---|---|---|---|
| 1 | Global Economic Analysis | n/a | n/a | n/a | n/a |
| 2 | Domestic Economic Analysis | n/a | n/a | n/a | n/a |
| 3 | Life Cycle Analysis | March 2023 to March 2024 | n/a | 2,765 | $245 |
| *3.1* | *LCA Modeling of Consequential Global Economic Scenarios & Task Level Collaboration Support* | *March 2023 to September 2023* | *June 2023* | *1,000* | *$85* |
| *3.2* | *Dynamic US LNG GHG LCA Tool* | *May 2023 to January 2024* | *November 2023* | *1,765* | *$160* |
| *3.3* | *Dynamic US LNG LCA GHG Tool Expansion for non-GHG Air Emissions and Water Consumption* | *May 2023 to November 2023* | *September 2023* | *0* | *$0* |
| 4 | Environmental Review | December 2022 to September 2023 | May 2023 | 1,080 | $206 |
| Z | FWP Execution and Shared Research Costs | December 2022 to March 2024 | n/a | n/a | $0 |
| | **Subtotal(s)** | | | **3,845** | **$451** |
| | Laboratory-Directed Research and Development | | | | $8 |
| | **Grand Total** | | | | $459 |

Please note, this update adds Task #3 to the Field Work Proposal (FWP). There is no change in the Laboratory-Directed Research and Development (LDRD) from the original FWP as LDRD was inadvertently not lowered to reflect only Task #4 and had already reflected the total for Task #3 and Task #4. The incremental funding request to support the addition of Task #3 is $245,000.

## A. Public Abstract

The Office of Resource Sustainability (ORS), within the Department of Energy's (DOE's) Office of Fossil Energy and Carbon Management (FECM), manages the natural gas regulatory program, specifically to support public interest review for the export of liquefied natural gas (LNG) sourced from the lower 48 states to the non-free trade agreement (non-FTA) countries where a public interest determination must be made. FECM's National Energy Technology Laboratory (NETL) will provide analysis support to ORS in support of LNG public interest determinations. The type of analytical services required will vary based on ORS's needs and timing. The analytical support includes but is not limited to market analysis, economic evaluation, and environmental life cycle analysis (LCA).

## B. Program Goals and Benefits

**Program Intent**

The ORS within the DOE's FECM manages the natural gas regulatory program, specifically to support public interest review for the export of LNG sourced from the lower 48 states to the non-FTA countries where a public interest determination must be made.

**Specific Goals**

The goal of this FWP is to provide analytical support for the evaluation of LNG exports with respect to the U.S. and global economic and environmental benefits and impacts.

**Benefits of Research**

The analytical research to enhance the DOE's understanding of the direct and potential indirect effects of LNG exports will help inform better decisions while enhancing public confidence in those decisions.

## C. Technical Challenges and Research Strategies

**Fundamental Challenge**

The ORS's analytical work on LNG exports was originally completed in the 2014 time period. The previous analysis work on market effects, qualitative understanding of potential environmental impacts from natural gas production and exports, and quantitative analysis of life cycle greenhouse gas (GHG) have limitations for use today in informing export decisions. Public feedback on LNG export authorizations have revealed the following challenges to be addressed:

- Global GHG Impacts: Need to consider if authorized LNG exports, permitted through 2050, would make it less likely that other countries will achieve the emissions reductions necessary to limit global warming.
- LNG End Use: Need to consider if exporting LNG will displace other fossil fuels to avoid increasing emission over the status quo.
- Domestic GHG Impacts: Need to evaluate the impact of exporting LNG on the U.S. ability to meet domestic emission reduction targets.
- Reconciliation of Modeled versus Measured Upstream Emissions: Need to improve the upstream natural gas emissions estimates to align with field measurement data to improve the representativeness of U.S. natural gas methane emissions.

**Research Strategy**

In coordination with ORS, NETL will design and execute analytical research to support LNG regulatory decisions. Each task is described below. Additional tasks will be amended to the FWP based on ORS support needs.

## D. Product/Task Overview

***Note: The task numbers within this FWP have been maintained to align with the original proposal received from FECM/ORS. Tasks #1 and #2 are not used. Task #3: Life Cycle Analysis and Task #4: Environmental Review are the only tasks described below, and funding requirements are summarized within the FWP.***

**Task #3: Life Cycle Analysis**

| | |
|---|---|
| **Program Funding:** Office of Regulation, Analysis, and Engagement, Program Funding TBD | |
| **Task PI:** Matt Jamieson | **Research Theme:** LNG Regulatory Support |
| **Other Key Personnel:** Harshvardham Khutal | **Timeline:** March 2023–March 2024 |
| **Est. EY Budget ($k):** 245 | **Est. Total Budget ($k):** 245 |

**1. Product/Task Objective**

Provide environmental LCA modeling support for assessing the domestic and global life cycle environmental performance of natural gas production, liquefaction, the ocean transport of LNG, regasification, and the end use of both LNG exports and domestic natural gas.

**2. Problem Statement**

The current LCA modeling of U.S. LNG exports does not account for the market consequences within the changes in energy production and consumption, globally, that result from changes in U.S. LNG export volumes. This project will use energy supply and consumption general equilibrium model results provided by ORS to estimate the changes in macro-level GHG emissions by economic sector. This task will also develop a dynamic LCA model to estimate life cycle GHG performance under varying decarbonization scenarios, regional natural gas production routes, and LNG delivery destinations. The objective is to improve the understanding of GHG emissions associated with LNG exports today and to help guide the program in the future.

**3. Justification and Benefits**

New, current state of science information is needed to inform the current LNG export decisions with the DOE and to enhance public and other stakeholder understanding of potential LNG environmental benefits and impacts.

**4. R&D Challenges**

The public data availability to effectively capture the current state of knowledge within the wide range of various perspectives on environmental impacts from natural gas production and export is a challenge.

**5. Past Work and Progress**

Not applicable.

**6. Approach**

This task provides support for two primary efforts referred to as Subtask 3.1: LCA Modeling of Consequential Global Economic Scenarios and Subtask 3.2: Dynamic U.S. LNG GHG LCA Tool. Each subtask is described below.

*Subtask 3.1: LCA Modeling of Consequential Global Economic Scenarios*

NETL will coordinate with ORS to obtain model results for energy supply and consumption for global economic scenarios. NETL will use existing life cycle modeling resources for energy supply and consumption (use) emission factors to estimate GHG intensity changes across modeled scenarios. Specifically, NETL expects ORS to provide three LNG export scenarios that forecast global energy production and use through the year 2050. Data will be provided on global natural gas production by region; imports, exports, and re-exports of LNG by source country, route, and transportation mode; and consumption by fuel, country, and end-use sector.

NETL will use the data to identify the production-to-consumption LNG pathways predicted by the economic equilibrium model. These pathways and their respective flows of natural gas will be used as inputs to the LCA. NETL will develop production-weighted average life cycle greenhouse emission factors for each production region, transportation mode and route, end-use sector, and end-use region and then apply these average factors to estimate the total emissions associated with each economic equilibrium scenario.

Life cycle models will include all natural gas processes, starting with source extraction and extending to end-use combustion. NETL will provide emission comparisons for alternative primary energy source scenarios or energy sources estimated as displaced by natural gas as a result of the economic equilibrium modeling using existing NETL lifecycle-based data and/or global modeling proxy data. The lifecycle-based models for alternative energy supplies and consumption, similar to natural gas and LNG pathways, data will not be representative of country specific performance parameters. NETL will use existing U.S. data and models as proxies where commensurate data and models for foreign operations are missing.

The scope of the life cycle GHG inventory includes carbon dioxide, methane, and nitrous oxide. Other GHGs provided by the Intergovernmental Panel on Climate Change with a global warming potential will be considered on a case-by-case basis if determined to be significant to the results interpretation. Black carbon, water vapor, and aerosol emissions that are known to contribute to climate change but lack scientific consensus on their quantitative contribution are excluded from the study.

The outcome of the consequential informed life cycle GHG results will report the change in terms of Global Warming Potential (GWP) based on the most recent Intergovernmental Panel on Climate Change report (the Sixth Assessment Report) for 20 and 100 year time frames for each scenario. The results will also be reported in terms of social cost of carbon (SCC) based on the most current U.S. guidance provided by ORS to NETL. The SCC requires all emission to be reported on a time-step increment to account for the time value of money. Standard economic practices will be used to discount to a specified nominal dollar time period. Therefore, all modeled scenarios will be based on annual or 5 year time steps. The modeling time period is anticipated to cover 2020–2050.

NETL will require a minimum of 90 days from the receipt of data from ORS to model each scenario, perform internal quality assurance on the underlying model, and document project findings. This 90 day lead time will require that ORS provide Task #1 results to NETL by March 1, 2023, to meet the overall project schedule.

NETL will provide a written report documenting the comparative findings of the LCA results for ORS use in developing the broader project level report. LCA results for all scenarios will be provided in Microsoft Excel. NETL will use refences to existing NETL models to the greatest extent to reduce new methodology documentation. Methods/approach, data sources, and data limitations will be included in the written report along with a discussion of the study results.

NETL will use the following primary models:

- NETL Natural Gas Baseline Model (2020 update to be completed in winter 2022)
- 2019 LNG GHG Study
- Alaska LNG Draft Supplemental Environmental Impact Statement (SEIS)
- NETL U.S. Electricity Baseline Model (2020 update of thermal electric and renewable energy production pathways)
- NETL Biomass and Renewable Natural Gas (RNG) Production Models (updated in 2022, as needed)
- NETL Fossil Hydrogen Baseline Report
- NETL Hydrogen and Water Analysis
- NETL Unit Process Library and other LCA Resources, www.netl.doe.gov/LCA

NETL will use the above models to develop packaged cradle-to-gate, gate-to-gate, and gate-to-grave unit process models to create GHG emission profiles for the applicable material and energy reference flows (technosphere flows of interest). The aggregated emission scalers will then be combined with scenario output data provided by ORS to determine the annual or 5 year time period GHG inventory data. End use emission factors will be applied to represent each economic sector's weighted average use of the delivered energy. The inventory data for each scenario will then be used to calculate the GWP and SCC results for each scenario.

NETL will estimate model sensitivity to expected future technological change in the natural gas system. Modeled technology changes will be applied at the macro-level to assess broad emissions reductions or efficiency improvements at the life cycle stage level (e.g., U.S. natural gas methane emissions are reduced by X%, ocean transport boil-off emission are reduced Y%, etc.). Uncertainty modeling is not included in this effort.

The outcomes of the consequential LCA will be: (1) estimated unit life cycle emissions factor associated with major supply-to-consumption pathways expected from LNG imports, exports, and re-exports; (2) average total life cycle emissions associated with the range of global economic, policy, and security postures represented by the equilibrium models; and (3) improved empirical basis for emissions driven by the inclusion of the modeling of upstream processes involved in supplying, transporting, and consuming LNG.

**Commented [ST1]:** This is the consequential adder.

**Commented [ST2]:** This is the GCAM/NEMS scenario results for each model run.

**Commented [ST3]:** NETL process based model has better granularity to model the NG/LNG operations than GCAM or NEMS.

*Subtask 3.2: Dynamic U.S. LNG GHG LCA Tool*

NETL will collaborate closely with ORS to develop a customization tool to estimate GHG performance of LNG sources from various U.S. basins and be delivered to existing global LNG regasification ports. NETL will evaluate customization with respect to supply and demand locations and quantities; end-use sector consumption; transportation demands by mode, route, and quantity; known or anticipated technological changes deemed influential of life cycle emissions; natural variation in supply sources; and variation in flaring efficiency and fugitive emissions.

The tool will be constructed by leveraging the Decarbonization What-If-Tool being developed under the Natural Gas Infrastructure FWP in Subtask 6.2. This effort will expand the Decarbonization Tool scope to include (1) LNG operations, (2) LNG decarbonization options, and (3) global consequential adder developed under Subtask 3.1.

To the extent feasible, NETL will use open access tools and data to enhance transparency and facilitate updates.

Sources of technological change to be modeled include but are not limited to improvements to pneumatics, compressors, emergency shutdown equipment and operations, pipeline modifications, liquefaction, regassification, and flaring throughout the production, processing, distribution, end use combustion, and transportation of natural gas. The model will also allow users to both specify carbon capture during liquefaction and source supplies of renewable natural gas.

NETL will also develop a user guidance document and model documentation.

**7. Task Milestones Table**

| Identifier | Type[1] | Expected Completion Date | Description (What, How, Who, Where) |
|---|---|---|---|
| EY23.3.A | Project | 06/30/2023 | Draft GHG Intensity and Social Cost of Carbon result for each general equilibrium model scenario provided by ORS to assess LNG exports. Delivered to ORS for comment and review as Excel tabulated results. |
| EY23.3.B | Major | 09/29/2023 | Final GHG Intensity and Social Cost of Carbon result for each general equilibrium model scenario provided by ORS to assess LNG exports. Delivered to ORS in Excel tabulated results with high-level modeling documentation. |
| EY23.3.C | Project | 11/17/2023 | Draft dynamic LCA tool with LNG operations and decarbonization strategies. |
| EY23.3.D | Major | 01/31/2024 | Final dynamic LCA tool with LNG operations and decarbonization strategies. |

[1] *Valid milestone types: Project; Major; Go/No-Go.*
*Major milestones and Go/No-Go decisions are tracked in the VUE. All milestones should follow the SMART model (Specific, Measurable, Achievable, Relevant, Timely).*

**8. Task Deliverables Table**

Quarterly reports and annual reports will be delivered 30 days after the end of the relevant period. One report will be provided each period at the FWP level and will cover the progress of this and other tasks. Topical reports specific to this task are presented in the table below and will be used to report on a certain technical aspect/topic/finding.

| Number | Deliverable Title | Expected Completion Date | Description |
|---|---|---|---|
| 1 | Consequential LCA Scenario Results: Draft | 06/30/2023 | Microsoft Excel Spreadsheet with GHG intensity and social cost of carbon results for each general equilibrium model scenario. |
| 2 | Consequential LCA Scenario Results: Final | 09/29/2023 | Microsoft Excel Spreadsheet with GHG intensity and social cost of carbon results for each general equilibrium model scenario and high-level modeling documentation. |
| 3 | Dynamic Life Cycle Assessment Tool: Draft | 11/17/2023 | Microsoft Excel-based tool and model documentation for estimating delivered LNG life cycle greenhouse gas emissions from natural gas production through delivery to a receiving regasification facility ready for ORS review. |

| Number | Deliverable Title | Expected Completion Date | Description |
|---|---|---|---|
| 4 | Dynamic Life Cycle Assessment Tool: Final | 01/31/2024 | Microsoft Excel-based tool and model documentation for estimating delivered LNG life cycle greenhouse gas emissions from natural gas production through delivery to a receiving regasification facility with ORS comments incorporated. |

**9. Task-Level Budget Detail**

| NETL Program Number | 1025016 | |
|---|---|---|
| **Category** | **FTEs** | **EY22/23 ($k)** |
| Contract Labor | 1.0 | $245 |
| Travel | 0.0 | $0 |
| Training | 0.0 | $0 |
| Equipment | 0.0 | $0 |
| Supplies | 0.0 | $0 |
| Other | 0.0 | $0 |
| Federal FTEs | 0.1 | Not Applicable |
| **Grand Total** | **2.1** | **$245** |

**Contractor Travel Detail**

No contactor travel is planned as part of this task—not applicable. Please note, Federal staff time and tavel is not funded thorugh the FWP.

**10. Unique NETL Competencies**

- Nationally Recognized Leader in Characterizing Natural Gas Value Chain Performance: NETL is a national leader in modeling energy systems from extraction to the delivery of services to the end customer (public). Historical work has focused on characterizing the environmental performance of the natural gas system using life cycle-based thinking and modeling approaches. The same skills and foundational models will be leveraged to deliver operational efficiency/energy intensity analysis value.
- Owner and Developer of 400+ Life Cycle Inventory (LCI) Databases for Energy Systems: NETL developed and maintains a public database of over 400 unit processes (dynamic engineering-based modeling blocks) that can be tailored to model different energy systems. All unit processes are made publicly available on the NETL website to enable transparency in modeling results and promote the Federal goals of open data access for work conducted with public funding.

**11. Complementary Efforts and Partnerships**

- Advanced Systems and Markets Analysis (ASMA) FWP: This FWP provides the base support for maintaining and advancing the models, tools, and databases for non-program specific elements and non-fossil energy (FE) comparison technologies.
- Natural Gas Infrastructure FWP: This FWP provides the base support for developing tools and materials to quantify and mitigate emissions from natural gas infrastructure. The execution year 2023 (EY23) work under the Natural Gas Infrastructure FWP is required to develop the Dynamic U.S. LNG GHG LCA Tool within this FWP.

**12. Technology to Market Plan**

Not applicable.

**13. Tables and Figures**

Not applicable.

**Task #4: Environmental Review**

| | |
|---|---|
| **Program Funding:** Environmentally Prudent Development | |
| **Task PI:** Amanda Harker Steele | **Research Theme:** LNG Regulatory Support |
| **Other Key Personnel:** Justin Adder | **Timeline:** December 2022–September 2023 |
| **Est. EY Budget ($k):** 165 | **Est. Total Budget ($k):** 206 |

**1. Product/Task Objective**

Review and update the 2014 Addendum to the Environmental Review to provide information on the resource areas potentially impacted by expanded unconventional gas production across the U.S. The update to the Addendum will provide a qualitative assessment of the environmental impacts, including the environmental justice implications from expanding natural gas production and transport based on a review of the most recent scientific peer-reviewed literature. Quantitative data resources will be leveraged where necessary.

**2. Problem Statement**

Existing research requires an update from the 2014 time period to the current state of knowledge. New considerations for environmental justice and social considerations were not previously considered.

**3. Justification and Benefits**

New, current state of science information is needed to inform the current LNG export decisions with the DOE and to enhance public and other stakeholder understanding of potential LNG environmental benefits and impacts.

**4. R&D Challenges**

The public data availability to effectively capture the current state of knowledge within the wide range of various perspectives on environmental impacts from natural gas production and export is a challenge.

**5. Past Work and Progress**

Not applicable.

**6. Approach**

NETL will support the DOE's ORS as the project lead to update the 2014 Addendum to Environmental Review Documents Concerning Exports of Natural Gas from the United States, hereafter, the 2014 Addendum or Addendum. As the purpose of the 2014 Addendum was to provide information to the public regarding the potential environmental impacts of natural gas production and exploration activities, updates to the Addendum will focus on updating the information to reflect advances in the understanding of the potential environmental impacts of these activities. Special consideration will be given to the environmental risks, mitigation strategies, and regulatory landscape associated with natural gas production, processing, transport, and end use and the influence of and implications to domestic and global GHG emissions policies. Consideration will also be given to major differences in the potential environmental impacts if the expanded production of domestic natural gas from unconventional resources were to be transported out of the U.S. via pipeline and liquefied and exported from liquefaction plants in neighboring countries, including Canada and Mexico.

Updates to the 2014 Addendum will be focused on the following topic areas: water resources (quality and quantity), air quality, GHG emissions, induced seismicity, land use impacts, and environmental justice considerations. The information reported on each topic area will be informed by the results of an in-depth review of the most recent scientific literature. With the exception of GHG emissions, the environmental impacts from expanding unconventional natural gas production and transport in the U.S. will occur at the local level. Appropriately, NETL will update the 2014 Addendum with a discussion of the local (e.g., regional) consequences of expanding natural gas production from unconventional resources. The unique conditions, challenges, and environmental resources of each local area to be impacted will be considered.

The environmental justice discussion included in the update will focus on the potential impacts of expanding production and transport for disadvantaged communities. Disadvantaged communities will be identified using publicly available tools and datasets, including but not limited to the Environmental Protection Agency's (EPA's) EJScreen, the Council of Environmental Quality's Climate and Economic Justice Screening Tool (beta version), the DOE's Low-Income Energy Affordability Data (LEAD) Tool, and the mapping tool developed by the U.S. Department of Transportation, to identify historically disadvantaged communities. The environmental justice discussion will also provide insight into what the benefits and costs associated with expanding natural gas production and transport domestically are and how those benefits and costs might be distributed across communities. A review of the different tenants of environmental justice, including distributive justice, procedural justice, and recognition justice, will also be provided by the updates made to the Addendum.

NETL will also identify and provide examples of the steps industry can take to reduce GHG emissions and other environmental impacts (e.g., groundwater contamination) at each point along the natural gas supply chain from extraction to pipeline transport, LNG facility operation, and marine shipping. Suggested steps will be informed by the results of the literature review conducted by NETL, which will consider the results of the LCA being completed under Task #3. Specifically, strategies for mitigating GHG emissions will be consistent with and complement the assumptions of the LCA conducted for the cradle-to-gate GHG emissions of expanding production and transport activities. The review will be divided to discuss the impacts of upstream (construction and completion of gas wells and subsequent production and processing), midstream (further processing and transport), and downstream (end use activities).

Final deliverables will include a report summarizing the current state of published descriptions of the potential environmental impacts of expanding natural gas production and transport. The primary objective of the report will be the provision of the predominant concerns about natural gas development and transport, as covered by the current literature. The sources to be reviewed will include scientific journal articles, reports, and other publicly available peer-reviewed publications. The report will be divided by chapter, and each chapter will contain its own reference section to permit further exploration by the reader. To complete the update to 2014 Addendum, NETL will explore the resources available from the following organizations:

- Bureau of Land Management (BLM)
- Department of Interior (DOI)
- Energy Information Administration (EIA)
- Congressional Research Service (CRS)
- EPA
- International Energy Agency (IEA)
- NETL
- Resources for the Future (RFF)
- U.S. Geological Survey (USGS)
- Peer-reviewed publications, reports, and other documents

Please note, the period of performance for this task is set as September 2023, to provide minor resources based on the remaining funding after the completion of the primary delivery in accordance with the Milestone and Deliverable schedules in the following sections. No work is planned or estimated in this FWP for the period after the acceptance of the Final Draft Environmental Review Addendum update and September 2023.

**7. Task Milestones Table**

| Identifier | Type[1] | Expected Completion Date | Description (What, How, Who, Where) |
|---|---|---|---|
| EY23.4.A | Project | 04/30/2023 | Complete the review of the current state of science for incorporation into the updated Environmental Review Addendum reviewed by the NETL Technical Project Monitor. |
| EY23.4.B | Major | 05/31/2023 | Draft Environmental Review Addendum is updated and ready for submission to HQ. |

[1] *Valid milestone types: Project; Major; Go/No-Go.*
*Major milestones and Go/No-Go decisions are tracked in the VUE. All milestones should follow the SMART model (Specific, Measurable, Achievable, Relevant, Timely).*

**8. Task Deliverables Table**

Quarterly reports and annual reports will be delivered 30 days after the end of the relevant period. One report will be provided each period at the FWP level and will cover the progress of this and other tasks. Topical reports specific to this task are presented in the table below and will be used to report on a certain technical aspect/topic/finding.

| Number | Deliverable Title | Expected Completion Date | Description |
|---|---|---|---|
| 1 | 2023 Environmental Review Addendum: Draft | 05/31/2023 | Update of the 2014 Environmental Review Addendum with the new addition of environmental justice considerations. |
| 2 | 2023 Environmental Review Addendum: Final | 06/30/2023 | Update of the 2014 Environmental Review Addendum with the new addition of environmental justice considerations. Draft Final with HQ comments incorporated. |

**9. Task-Level Budget Detail**

| NETL Program Number | 1025016 | |
|---|---|---|
| **Category** | **FTEs** | **EY22/23 ($k)** |
| Contract Labor | 0.9 | $206 |
| Travel | 0.0 | $0 |
| Training | 0.0 | $0 |
| Equipment | 0.0 | $0 |
| Supplies | 0.0 | $0 |
| Other | 0.0 | $0 |
| Federal FTEs | 0.1 | Not Applicable |
| **Grand Total** | **1** | **$206** |

**Contractor Travel Detail**

No contactor travel is planned as part of this task—not applicable. Please note, Federal staff time and tavel is not funded thorugh the FWP.

**10. Unique NETL Competencies**

- Hitachi Energy Velocity Database, which contains a suite of power-related and emissions datasets.
- Enverus (formerly Drillinginfo), which provides data on natural gas and liquids exploration and production, including completion data and permitting.
- NETL in-house developed models: NETL's Water Needs and Technology Benefits Model and Linear Optimization and Dispatch (LOAD) Tool.
- National Energy Modeling System (NEMS) Energy Water Model: NETL is the first to incorporate water availability and use into the EIA NEMS. NETL was the primary modeling institution for all previous revisions and has all the simulation models of all the technologies.
- NETL's support of on-going energy, environmental, and social justice efforts, including data collected to support the Justice40 Initiative, Communities LEAP Pilot, and Energy Communities.
- Directly impacted by coal closures and the Interagency Working Group (IWG) on Coal and Power Plant Communities and Economic Revitalization.
- Energy analyses include assessments of near- and long-term trends within the U.S. and world energy industries that may impact energy price, availability, and security.

**11. Complementary Efforts and Partnerships**

- ASMA FWP: This FWP provides the base support for maintaining and advancing the models, tools, and databases for non-program specific elements and non-FE comparison technologies.
- Natural Gas Infrastructure FWP: This FWP provides the base support for developing tools and materials to quantify and mitigate emissions from natural gas infrastructure.
- Carbon Dioxide Removal (CDR) FWP: This FWP investigates a combination of technologies, including point-source capture, hydrogen production with carbon management, carbon conversion to useful chemicals or products, reduction in methane emissions, increased and sustainable production of critical minerals, and CDR designed to reduce the environmental impacts of fossil fuel-based energy production systems.
- U.S. Ethane: Market Issues and Opportunities Report to Congress (pending) in response to a request under the Consolidated Appropriations Act, 2021 (Public Law 116-260), specifically the Energy and Water Development and Related Agencies Appropriations Act, 2021–Division D. The report focuses on the projected long-term trends for the domestic production, consumption, and export of ethane and prospective opportunities and risks (environmental and local community impacts) associated with U.S. petrochemical manufacturing that uses ethane as a feedstock.
- Intermountain West Energy Sustainability & Transitions–Phase 1 Final Report: This report details findings to a broad range of stakeholders with shared interest in planning for the energy transition in the I-West region. NETL provided subject matter experts (SME) topic areas, including but not limited to the environmental justice impacts of the transition.
- NETL has engaged with several partners who are responding to the funding opportunity announcement (FOA) for Hydrogen Hubs. NETL is expected to be provided SME on energy and environmental justice, markets analysis, and LCA.

**12. Technology to Market Plan**

Not applicable.

**13. Tables and Figures**

Not applicable.

## E. Major Project Milestones

| Identifier | Type | Expected Completion Date | Description (What, How, Who, Where) |
|---|---|---|---|
| **Task #3: Life Cycle Analysis** | | | |
| EY23.3.B | Major | 09/29/2023 | Final GHG Intensity and Social Cost of Carbon result for each general equilibrium model scenario provided by ORS to assess LNG exports. Delivered to ORS in Excel tabulated results with high-level modeling documentation. |
| EY23.3.D | Major | 01/31/2024 | Final dynamic LCA tool with LNG operations and decarbonization strategies. |
| **Task #4: Environmental Review** | | | |
| EY23.4.B | Major | 05/31/2023 | Draft Environmental Review Addendum is updated and ready for submission to HQ. |

**From:** Skone, Timothy
**Sent:** Fri, 9 Jun 2023 20:23:22 +0000
**To:** Jamieson, Matthew B.
**Subject:** PNNL & OnLocation Slides from May 30th
**Attachments:** LNG_Meeting_20230526.pdf, Progress_update_pnnl_05262023.pdf

OnLocation
A KEYLOGIC COMPANY

# Updated Natural Gas Regulatory Analyses

## *GCAM and NEMS Scenario Comparison*

**In support of Department of Energy**
**Office of Fossil Energy and Carbon Management**
**Office of Resource Sustainability**

May 26, 2023

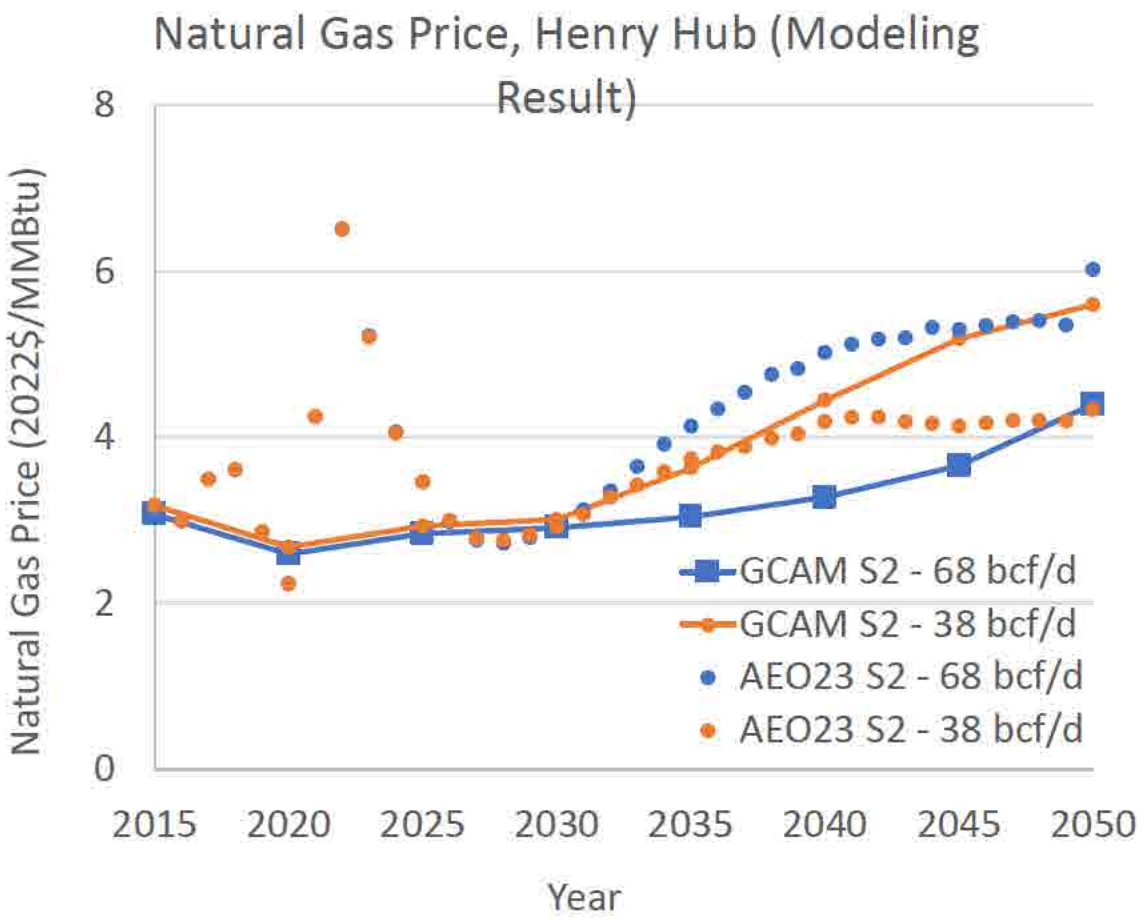
***DRAFT*DELIBERATIVE*PRE-DECISIONAL***



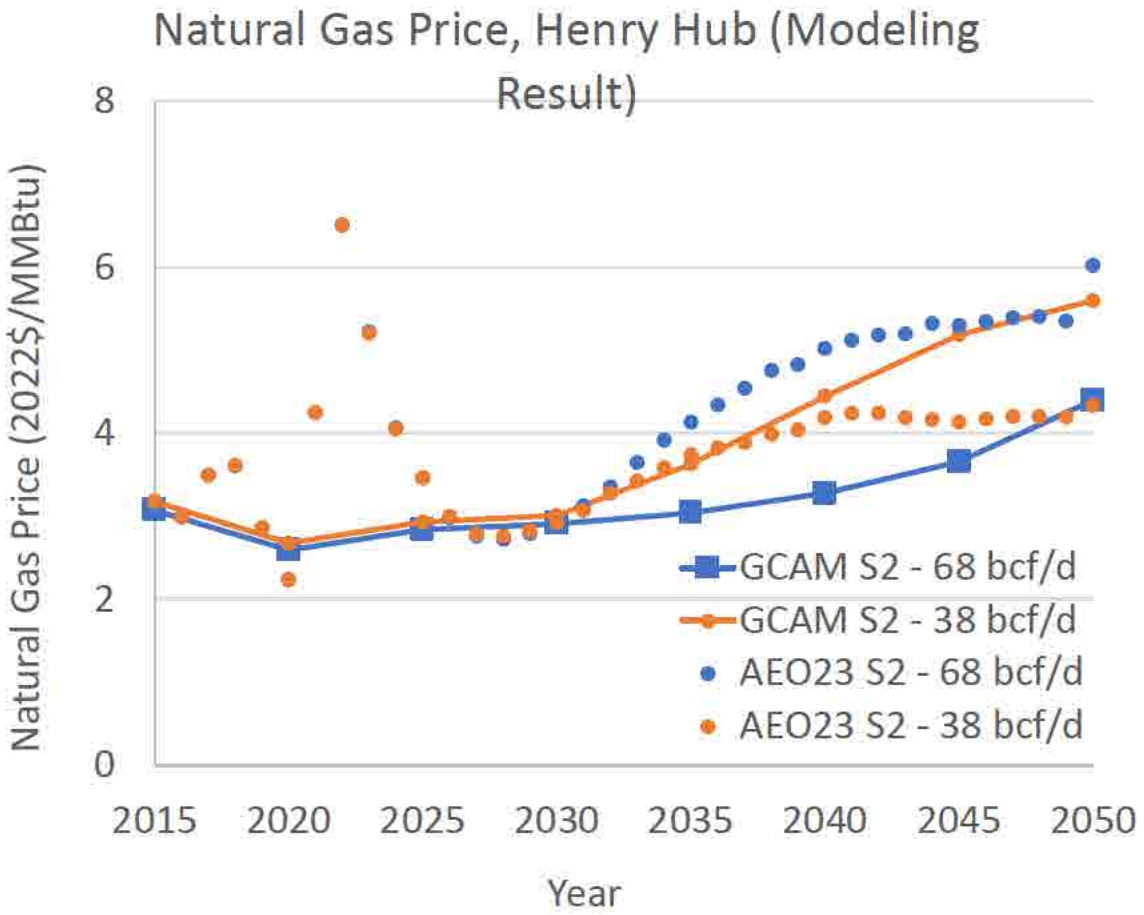
# Meeting Agenda

- Natural Gas Price Curve Alignment
  - Comparison to EIA Issues in Focus – LNG
- Scenario 6 Net Zero Alignment
  - Emissions comparison
  - DAC Technology Assumptions

# NG Price Curves: S2

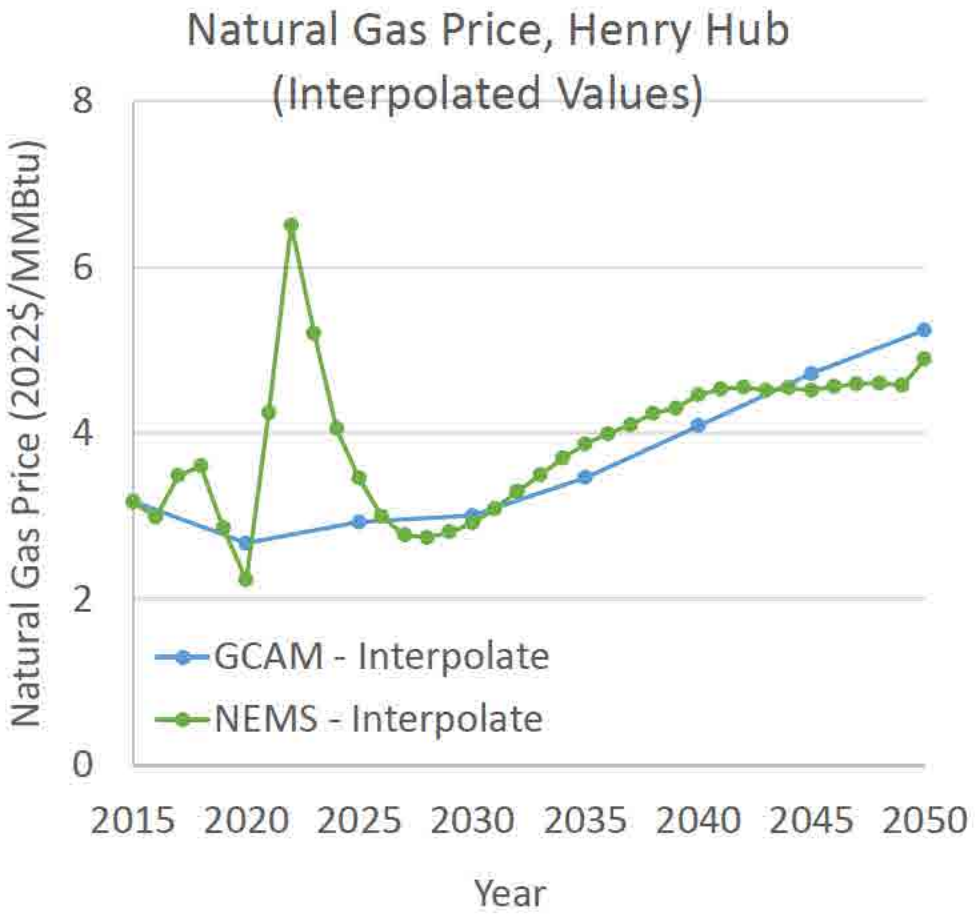


# NG Price Curves: S2




Linear Interpolation

48 bcf/d



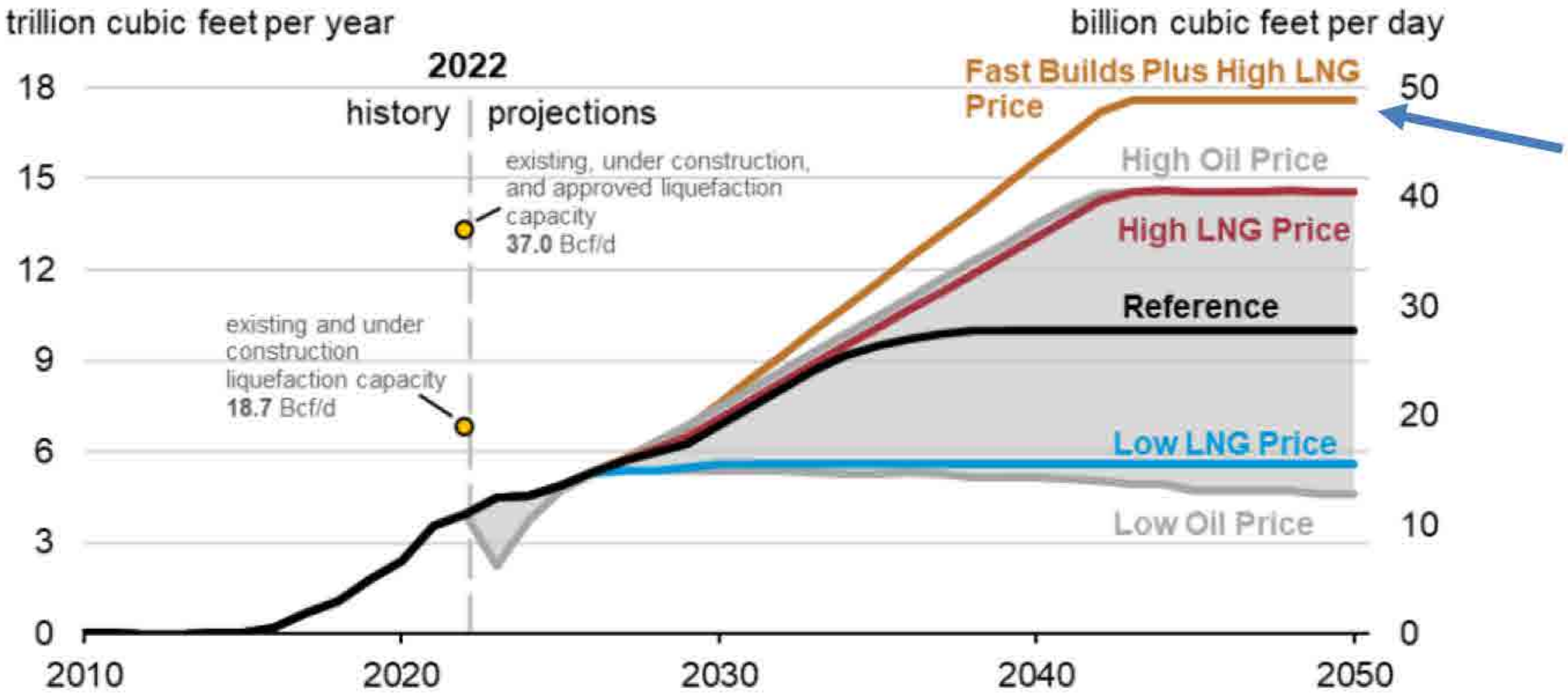
# EIA Issues in Focus: LNG

Four cases, run endogenously based on AEO2023

| Case | International LNG Price | LNG Maximum Build Rate |
|---|---|---|
| AEO2023 Reference | +/- 0% | 600 bcf/year/year |
| High LNG Price | + 25% | 600 bcf/year/year |
| Low LNG Price | - 20% | 600 bcf/year/year |
| Fast Builds + High LNG Price | + 25% | **800 bcf/year/year** |

# EIA Issues in Focus: LNG

**Figure 1. U.S. liquefied natural gas (LNG) exports, AEO2023**




Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023 (AEO2023)* and LNG Capacity Tracker

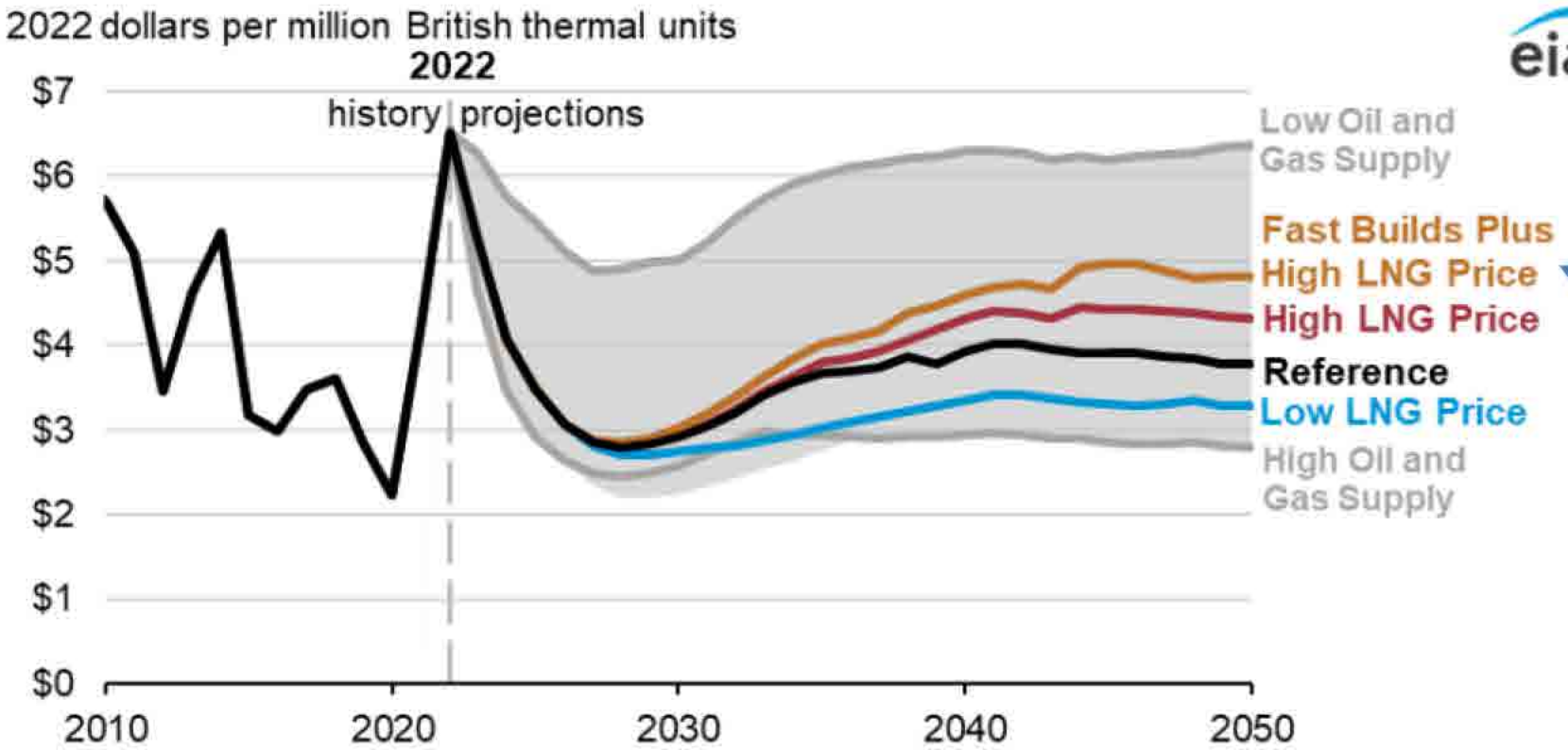
Note: Existing, under construction, and approved LNG capacities are baseload capacities. Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.

At 48 bcf/d, this could end up close to our NG price alignment run.

Maximum slope here (800 bcf/year/year) is similar to the maximum year-to-year change from the NEMS 48 bcf/d case (807 bcf/year/year)

# EIA Issues in Focus: LNG

**Figure 2. Natural gas spot price at the Henry Hub, AEO2023**

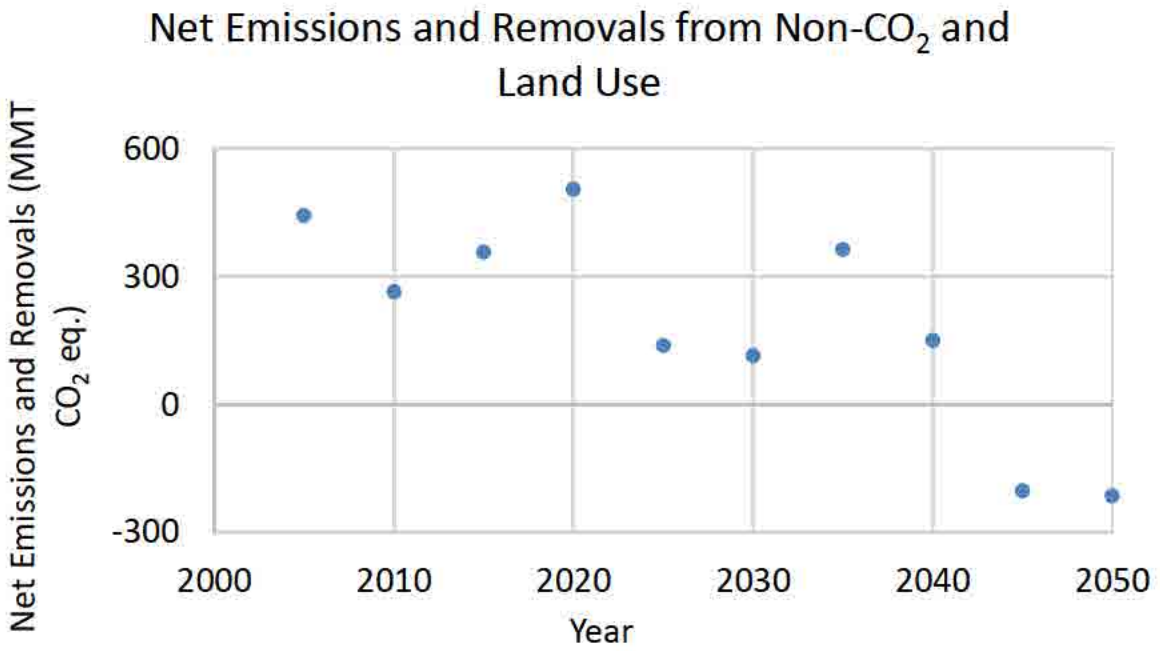


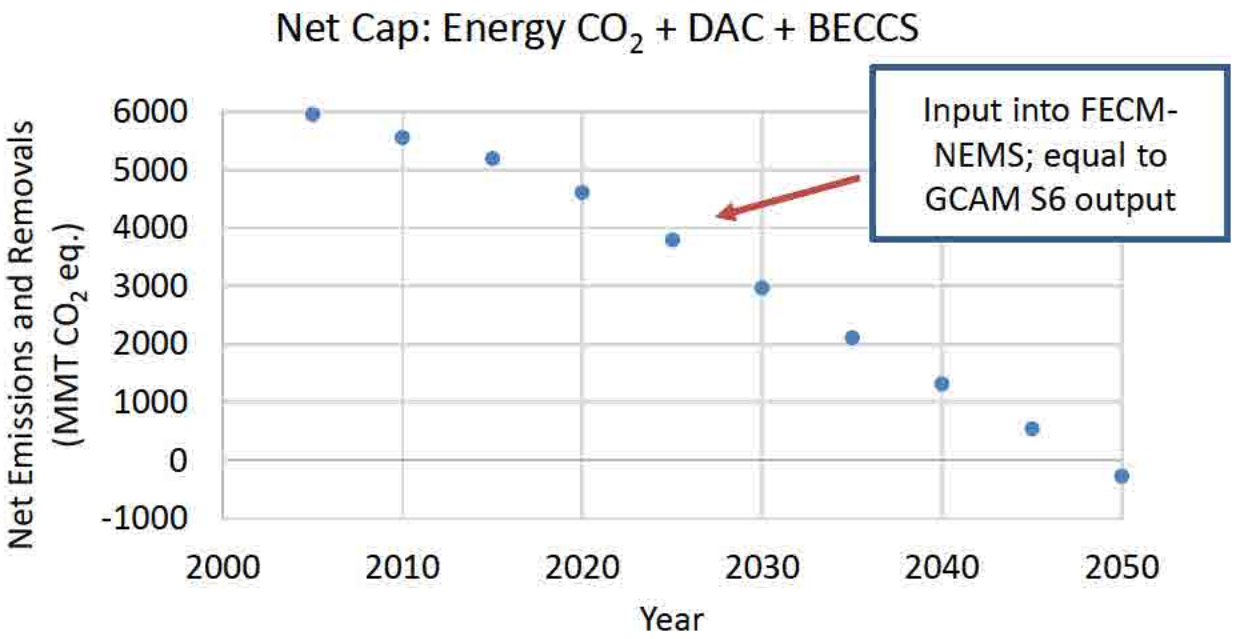

Data source: U.S. Energy Information Administration, *Annual Energy Outlook 2023* (AEO2023)
Note: Shaded regions represent maximum and minimum values for each projection year across the AEO2023 Reference case and side cases.

End price ($2022 4.81/MMBtu) is likewise similar to 48 bcf/d case in NEMS ($2022 4.86/MMBtu)

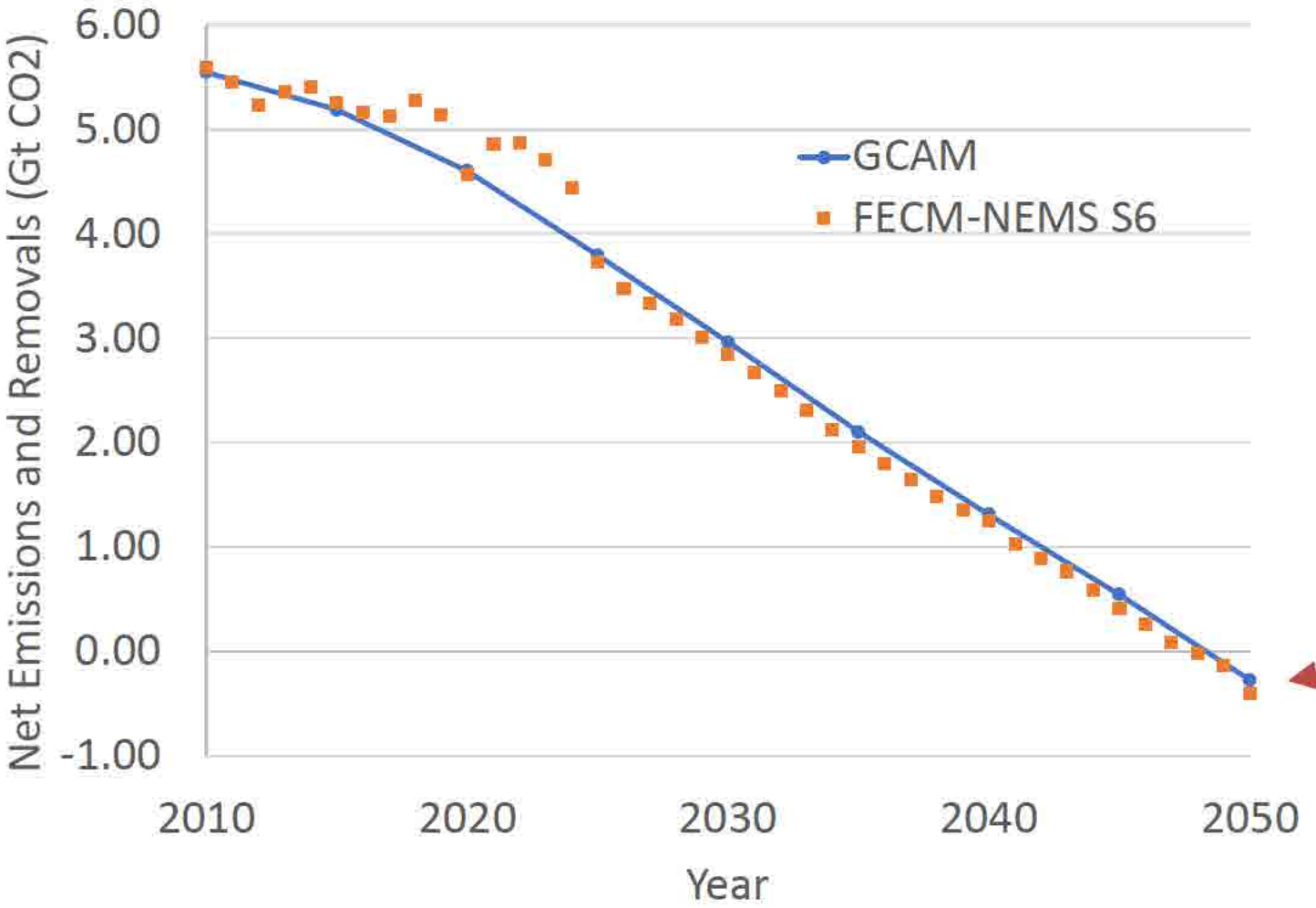
# GHG Emissions Cap

- The left-hand chart illustrates the net emissions from the other gases and land use based on GCAM outputs. FECM-NEMS does not model these values.
- The right-hand chart is the Net Cap used in modeling.
- The sum of the two plots should equal 0 in 2050 (we overshot slightly)



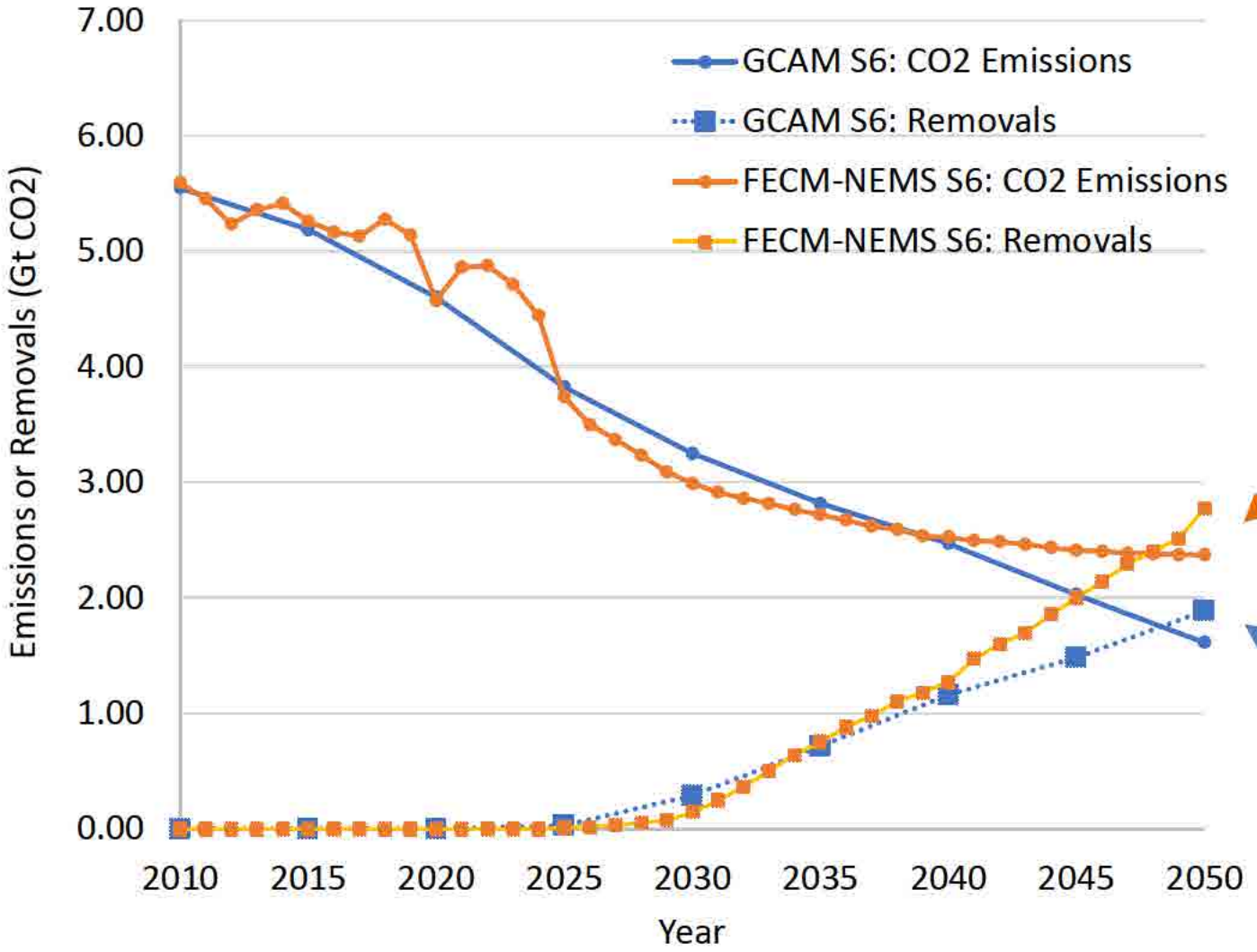



# GHG Emissions Cap – Actual Net Emissions (Output)




Small difference – we accidentally left in $CH_4$ from natural gas

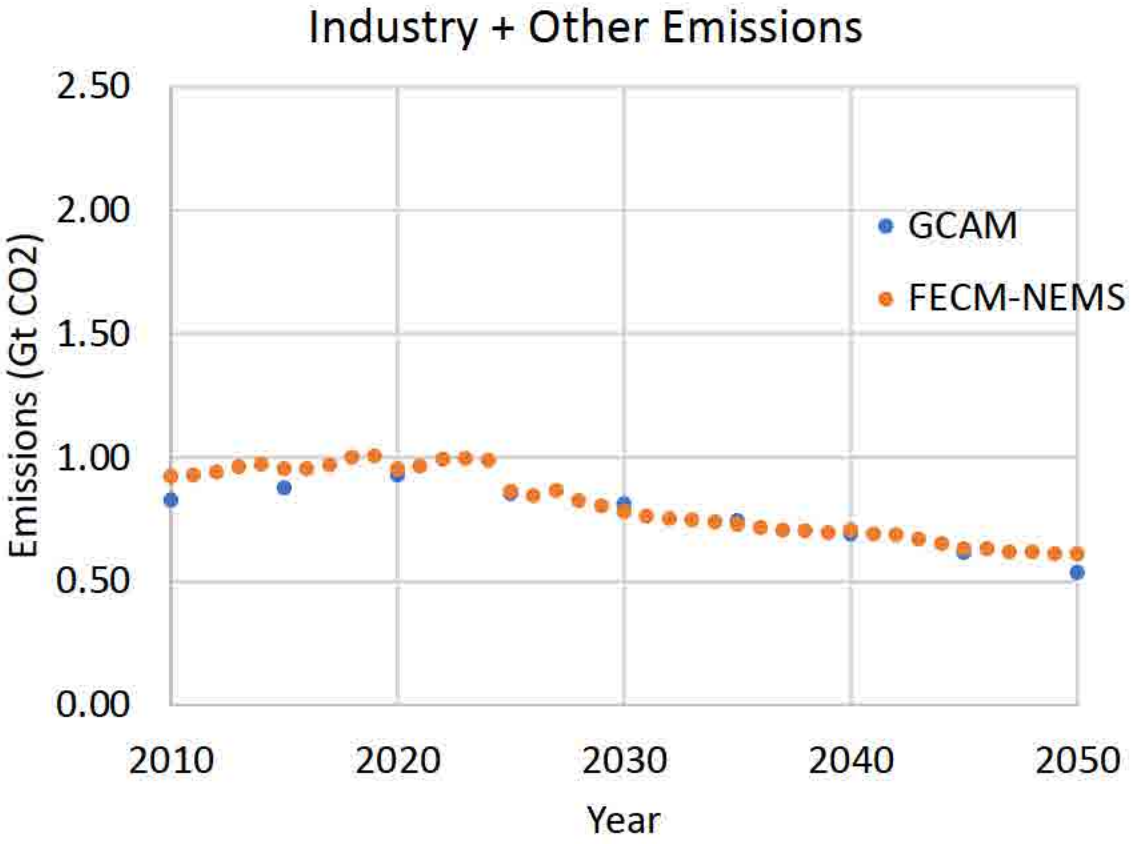
# Emissions and Removals Comparison

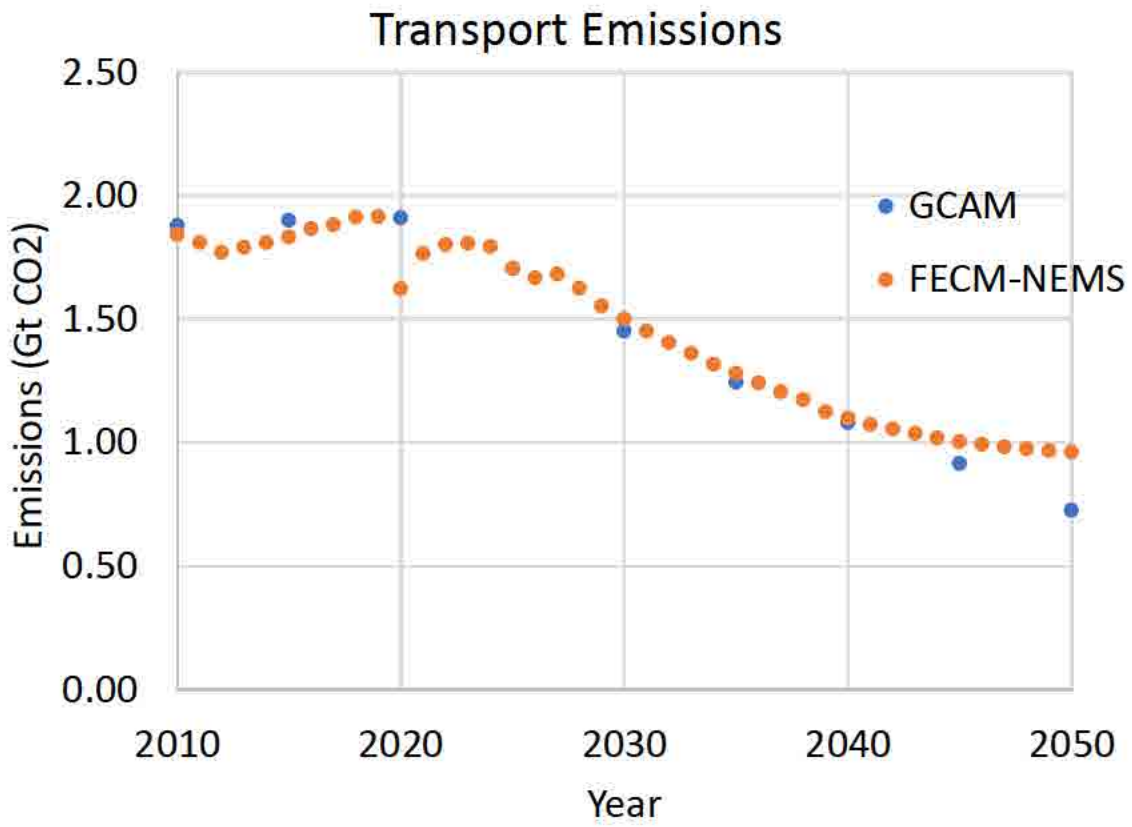



Removals and emissions intersect at this point for FECM22 S6. There are slightly more removals than emissions, satisfying the net-zero criteria.
**Note: Removals in FECM-NEMS 90% DAC, 2% BECCS, and 8% H2 Biomass**

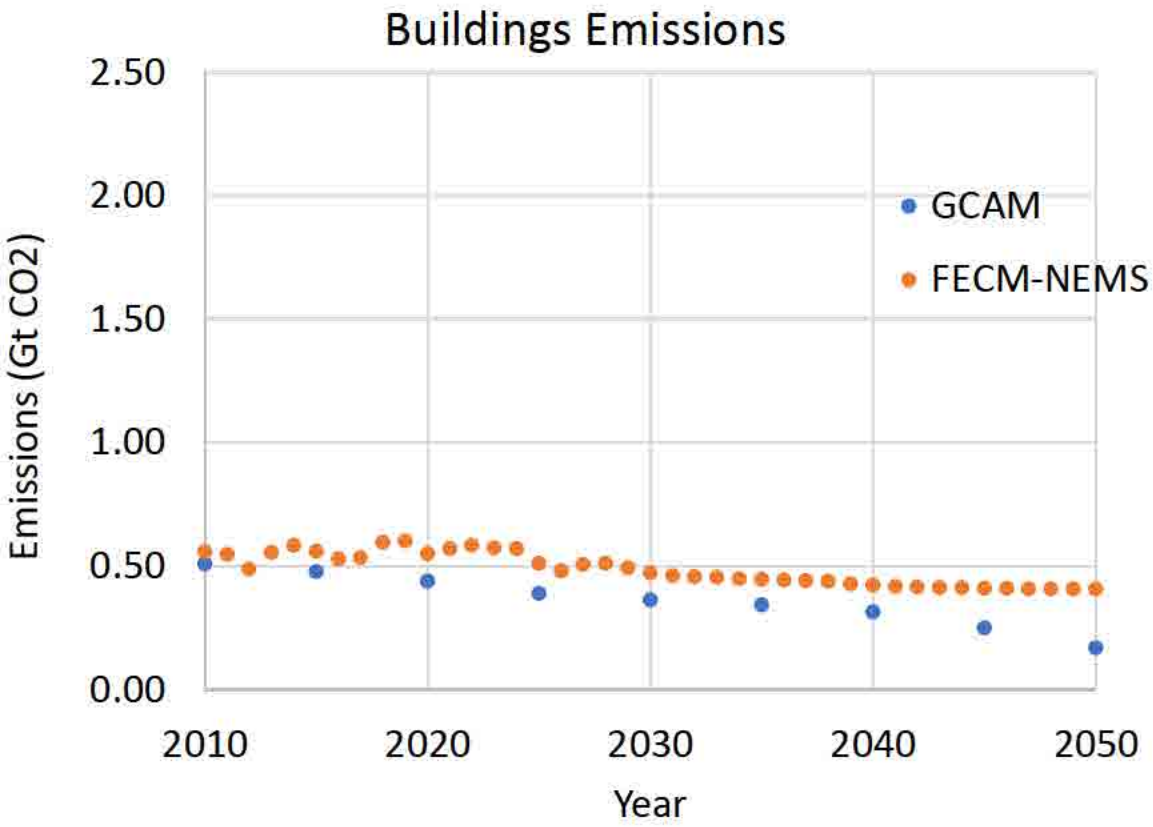
The GCAM S6 has a similar emissions/removal delta, but the intersection occurs lower, which means fewer emissions and fewer removals to reach net-zero.
**Note: Removals in GCAM are 43% DAC + 57% BECCS**

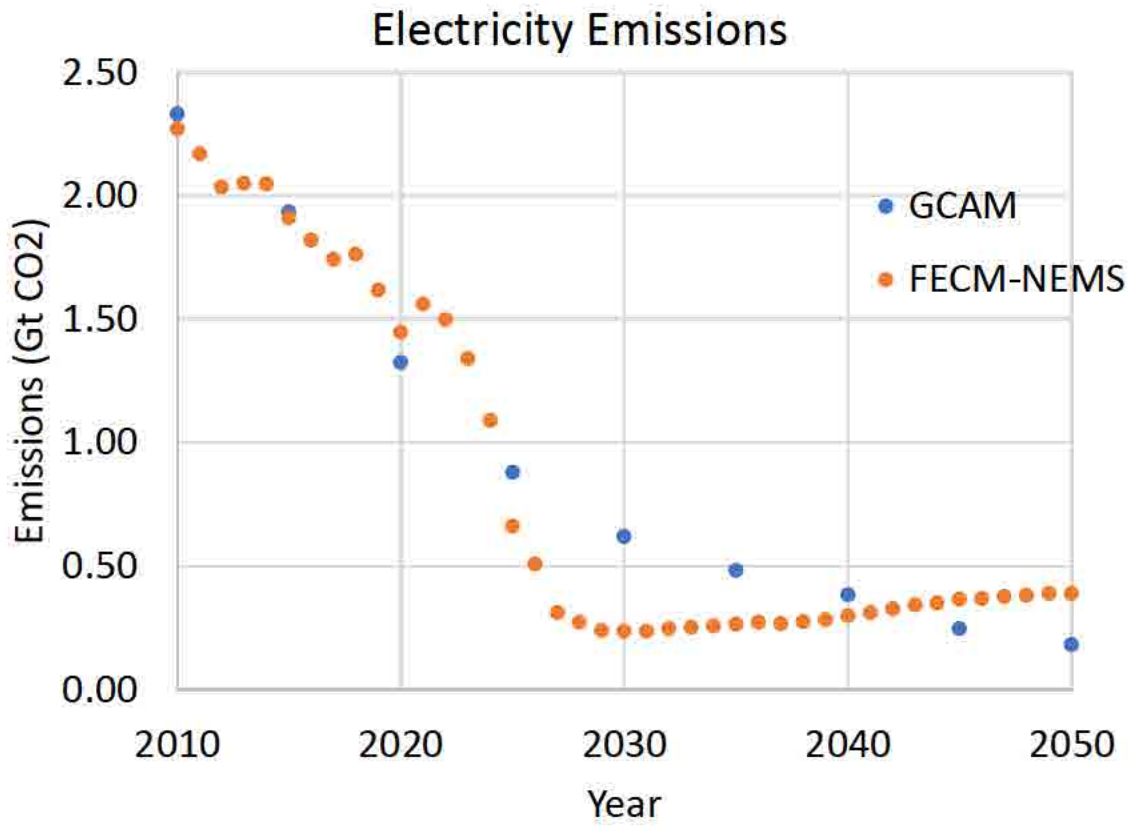
# GCAM vs FECM-NEMS Emissions Comparison: Industry and Electricity are Similar



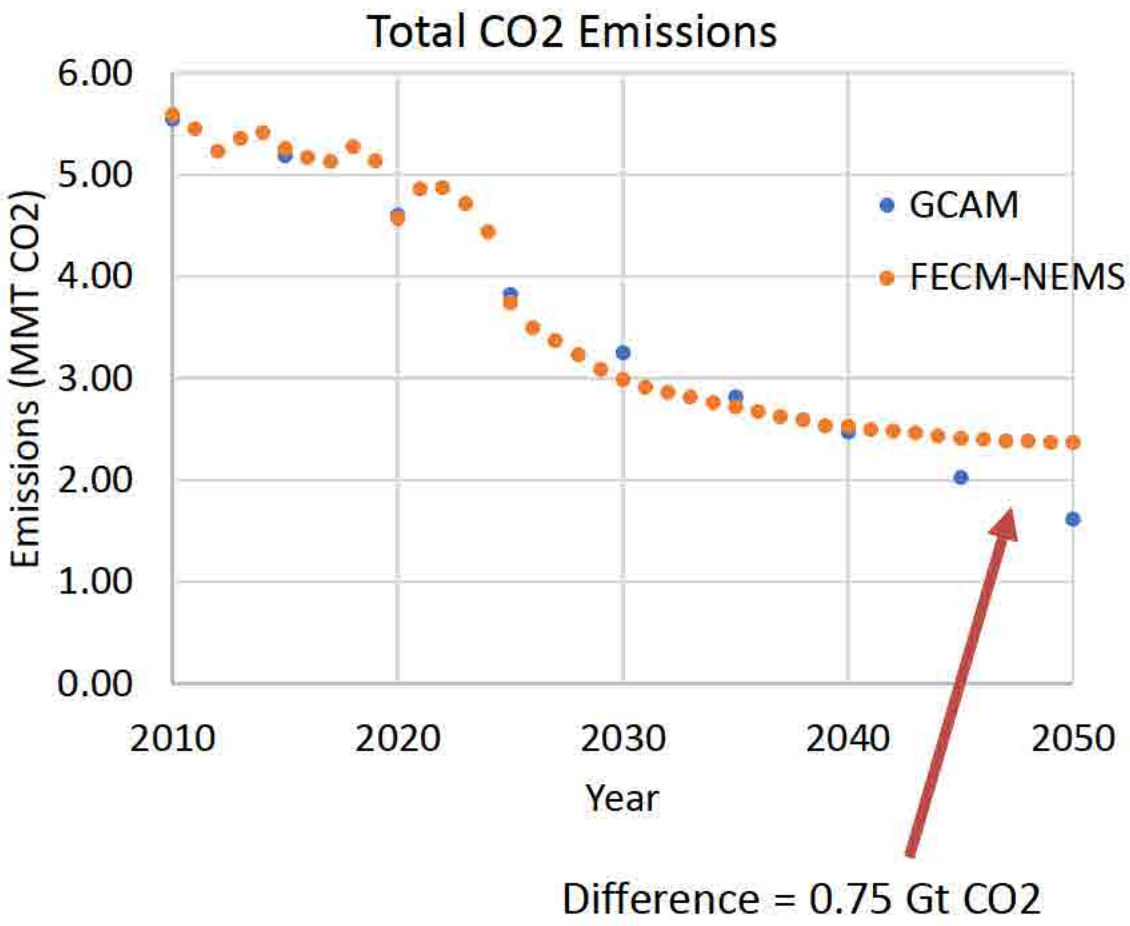



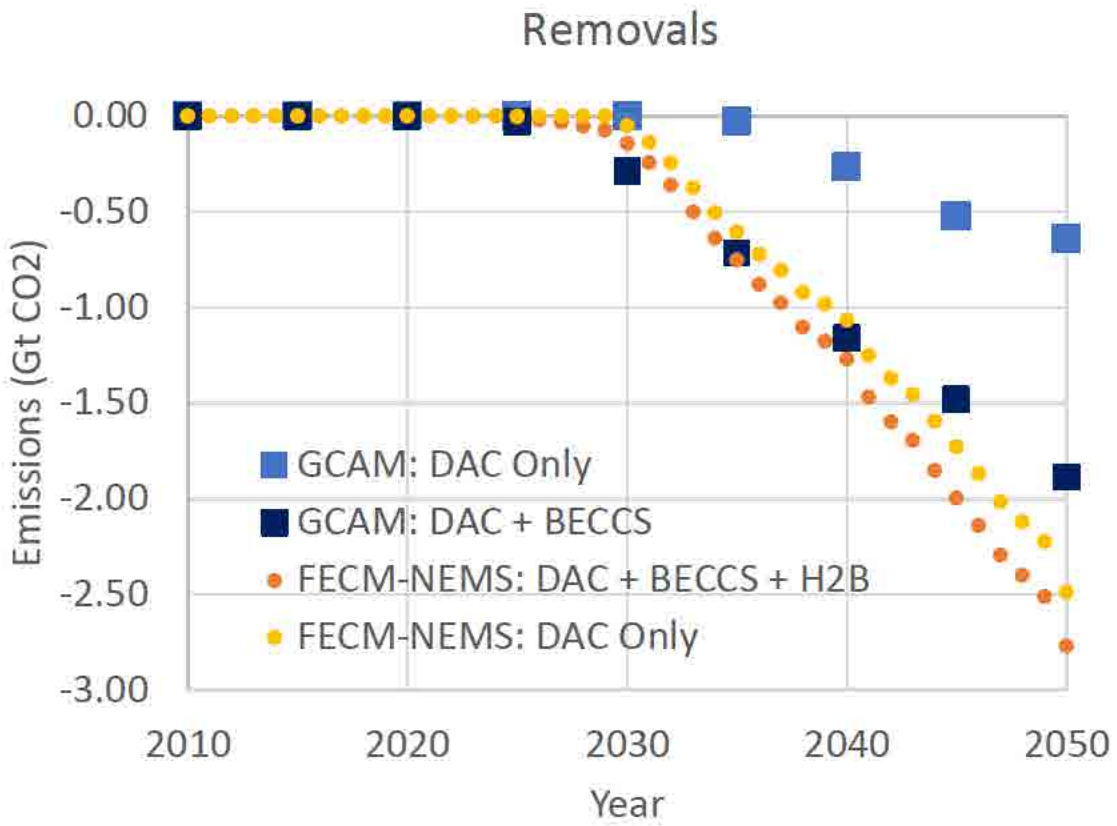
# GCAM vs FECM-NEMS Emissions Comparison: Differences Between Buildings (Residential + Commercial) and Electricity



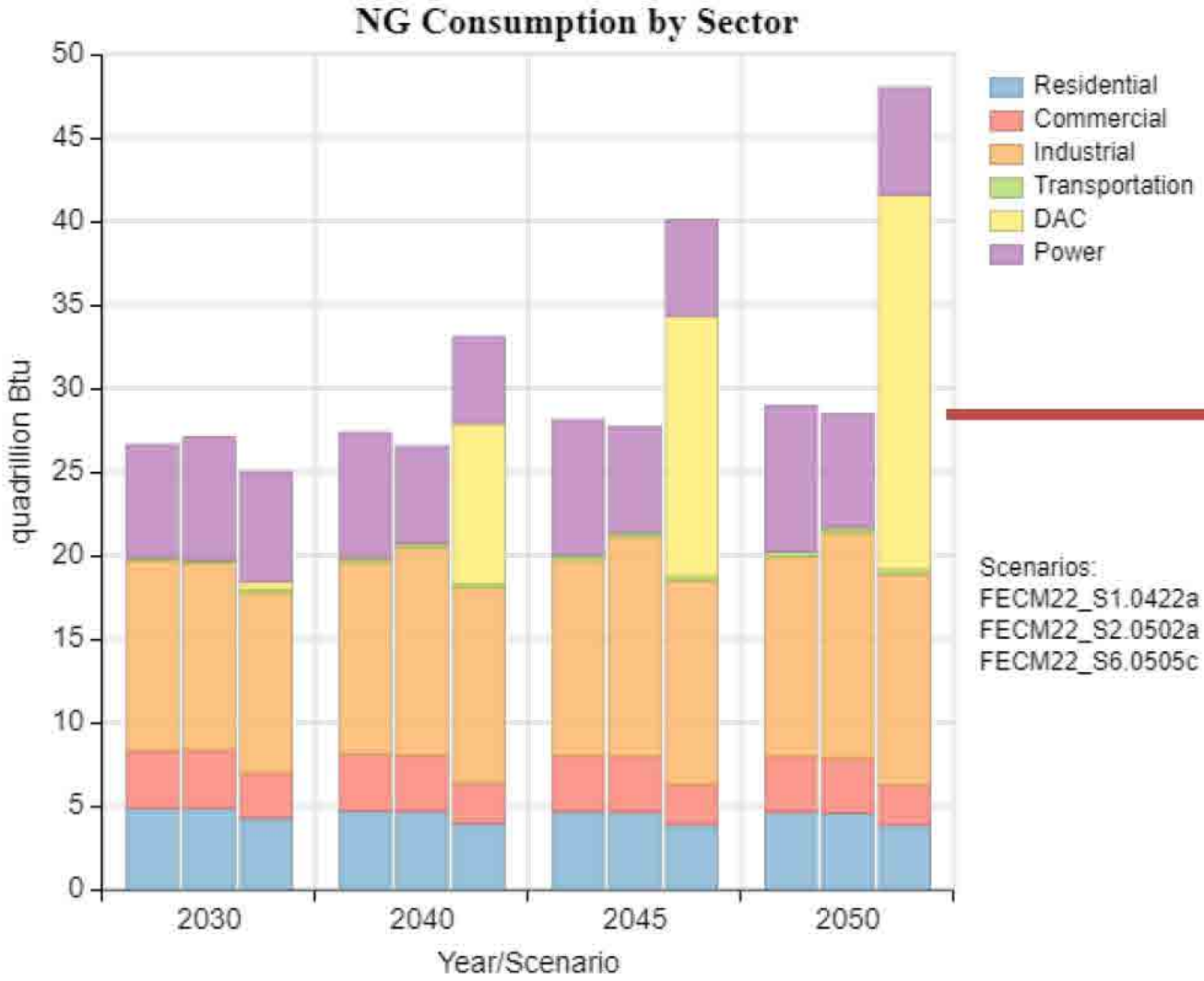



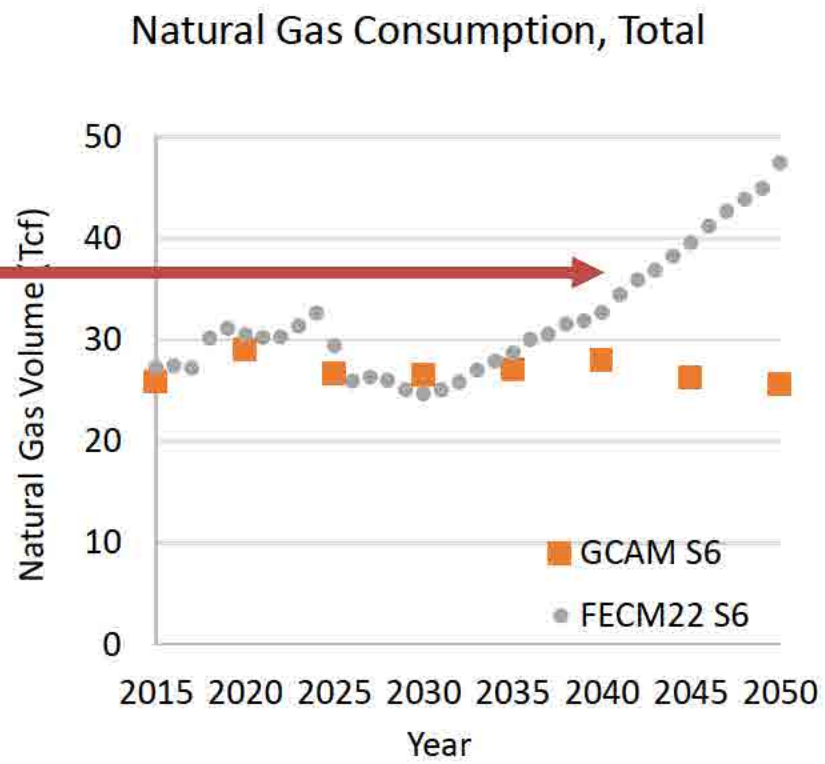
# GCAM vs FECM-NEMS Emissions Comparison: Differences Between Buildings (Residential + Commercial) and Electricity



# Natural Gas Price, GCAM and FECM Comparison




*Left to right: FECM22 S1, FECM22 S2, FECM22 S6

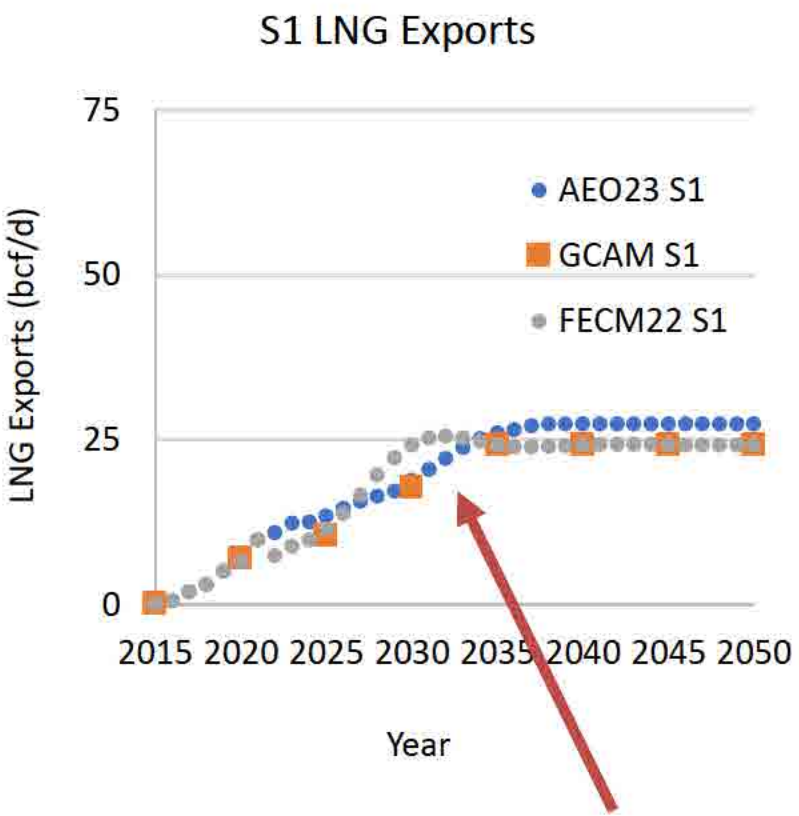
# DAC Technology Comparison

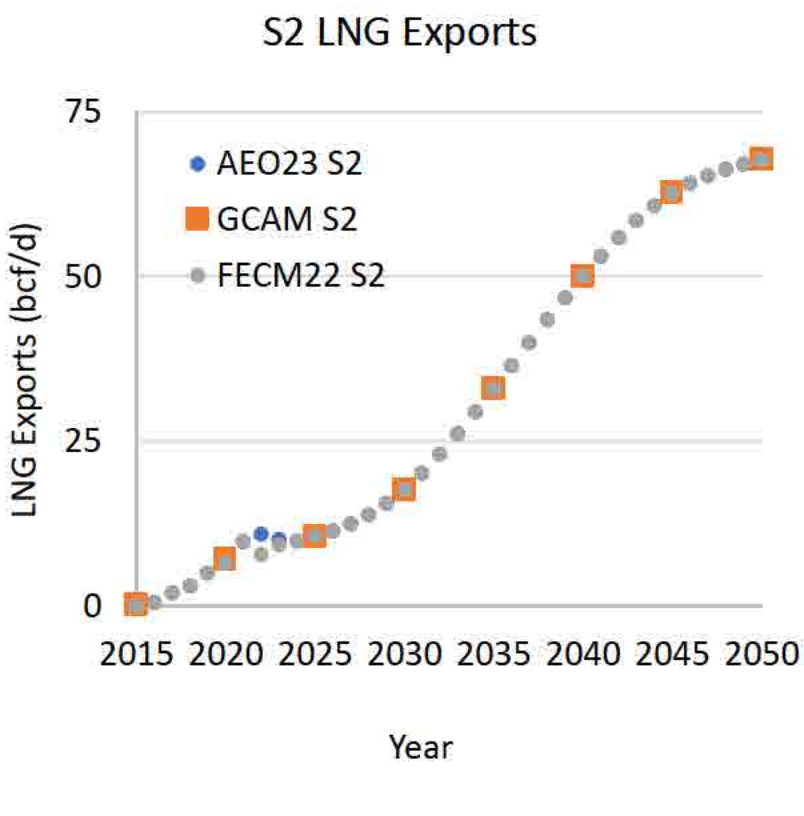
| Tech | Capex $/ton year | CRF | Capex $/ton | Opex $ton | Electricity demand kwhr/ton | Heat/fuel demand MMBTU/Ton | Recalculated GCAM Non Energy Cost | Comment / Reference |
|---|---|---|---|---|---|---|---|---|
| HT GCAM | $1,146 | 13% | $143 | $42 | 361.11 | 5.6 | $185 | Intermediate estimate for HT DAC using natural gas (2030 values for SSP1, SSP2) Energy in GJ/ton converted to kwhr/ton and MMBTU/ton |
| HT GCAM Fully electric | $1,146 | 13% | $143 | $42 | 1416.67 | - | $101 | Intermediate estimate for fully-electric HT DAC (2030 values for SSP1, SSP2) Energy in GJ/ton converted to kwhr/ton |
| FECM grid | $1,300 | 7.1% | $112 | $71 | 450 | 8.75 | | Total of Fixed and Variable O&M; Capex includes other factors |
| FECM NG only | $1,500 | 7.1% | $129 | 83.6 | 0 | 9.27 | | Total of Fixed and Variable O&M ; Capex includes other factors |

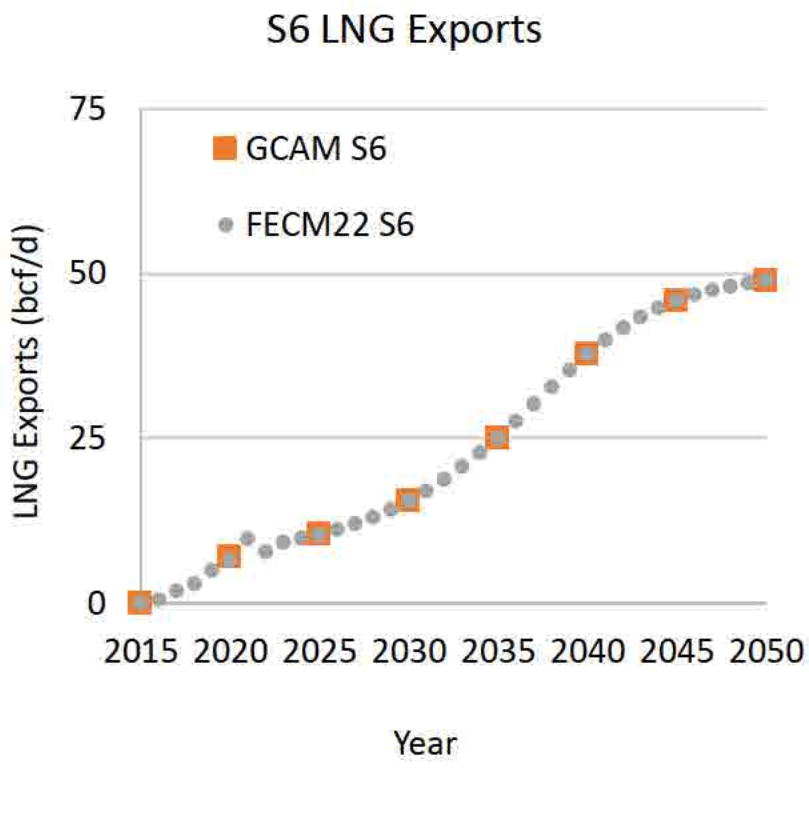
# Extra Slides

Note: These results are older and use the old NG supply curve

# LNG Exports (exogenous input)



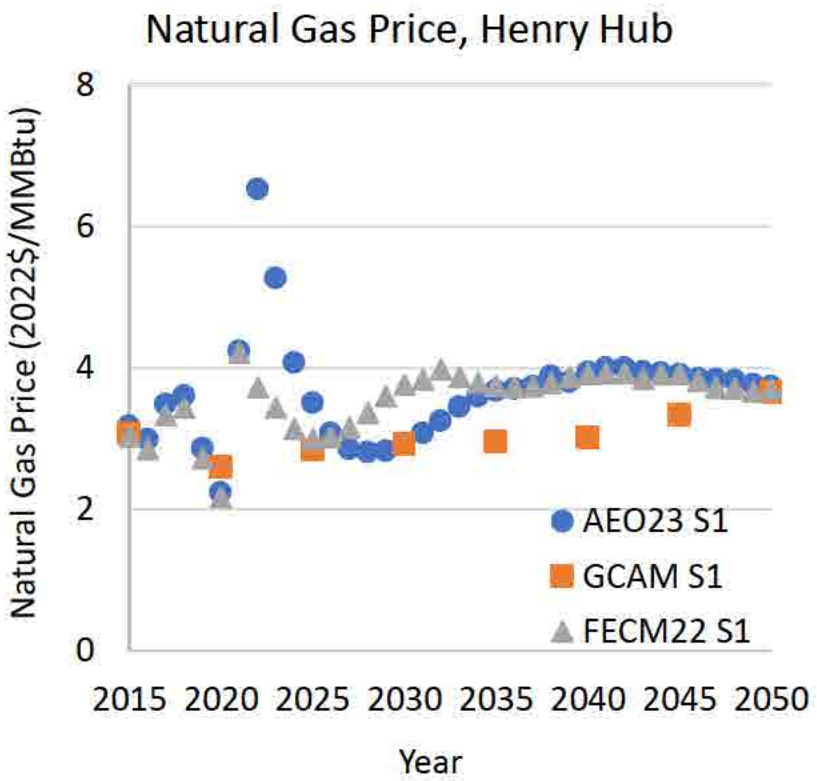



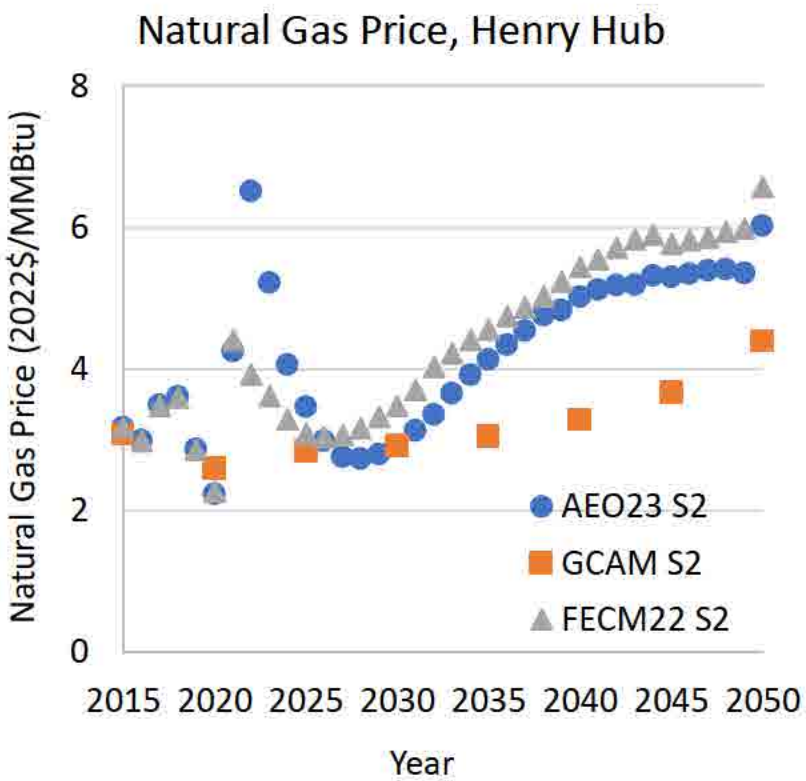



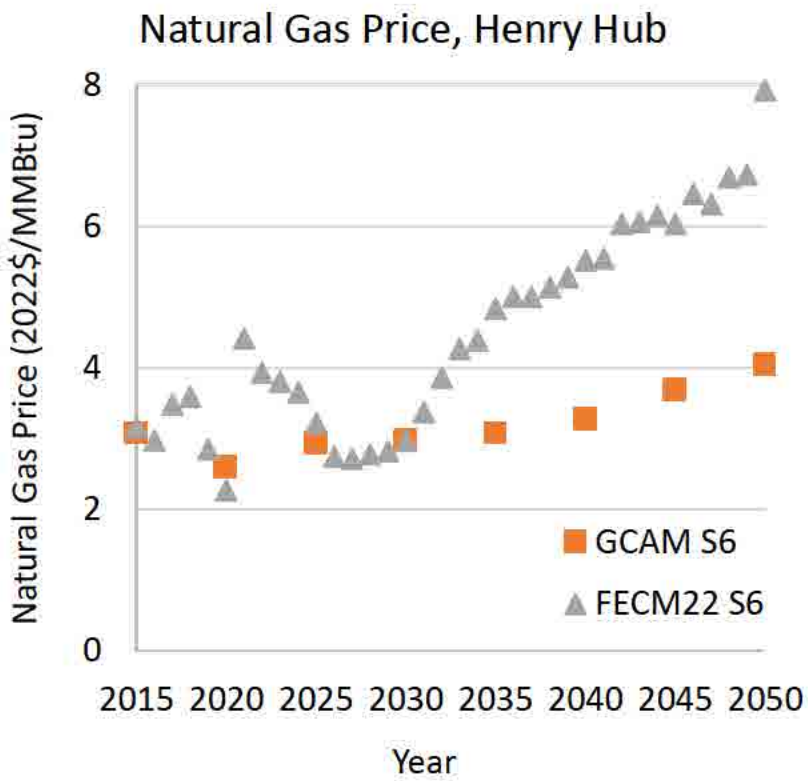

*Slight difference for FECM22 S1 – haven't updated to new S1 definition (27.34 bcf/d) yet

Note: These results are older and use the old NG supply curve

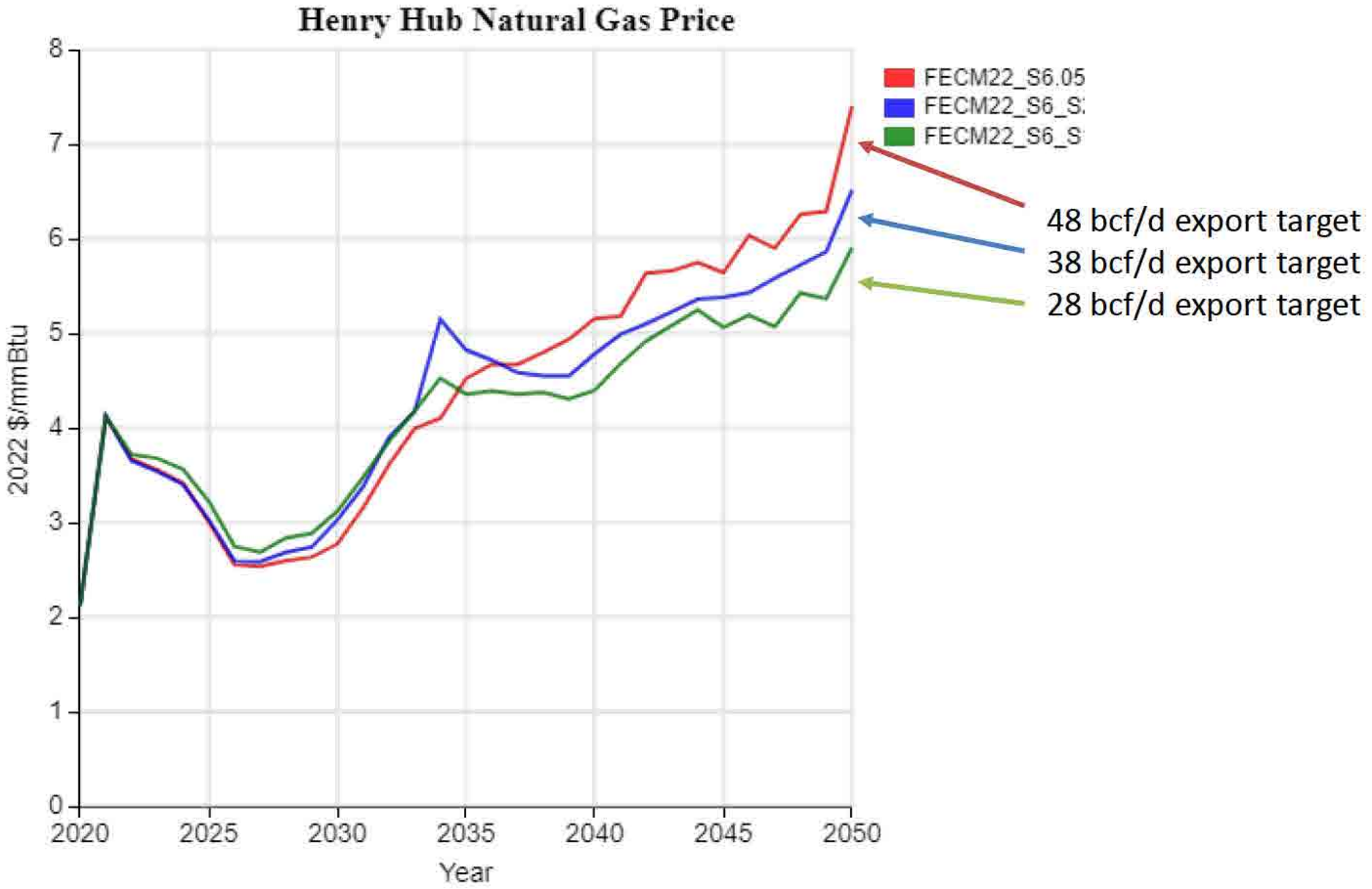
# Natural Gas Price



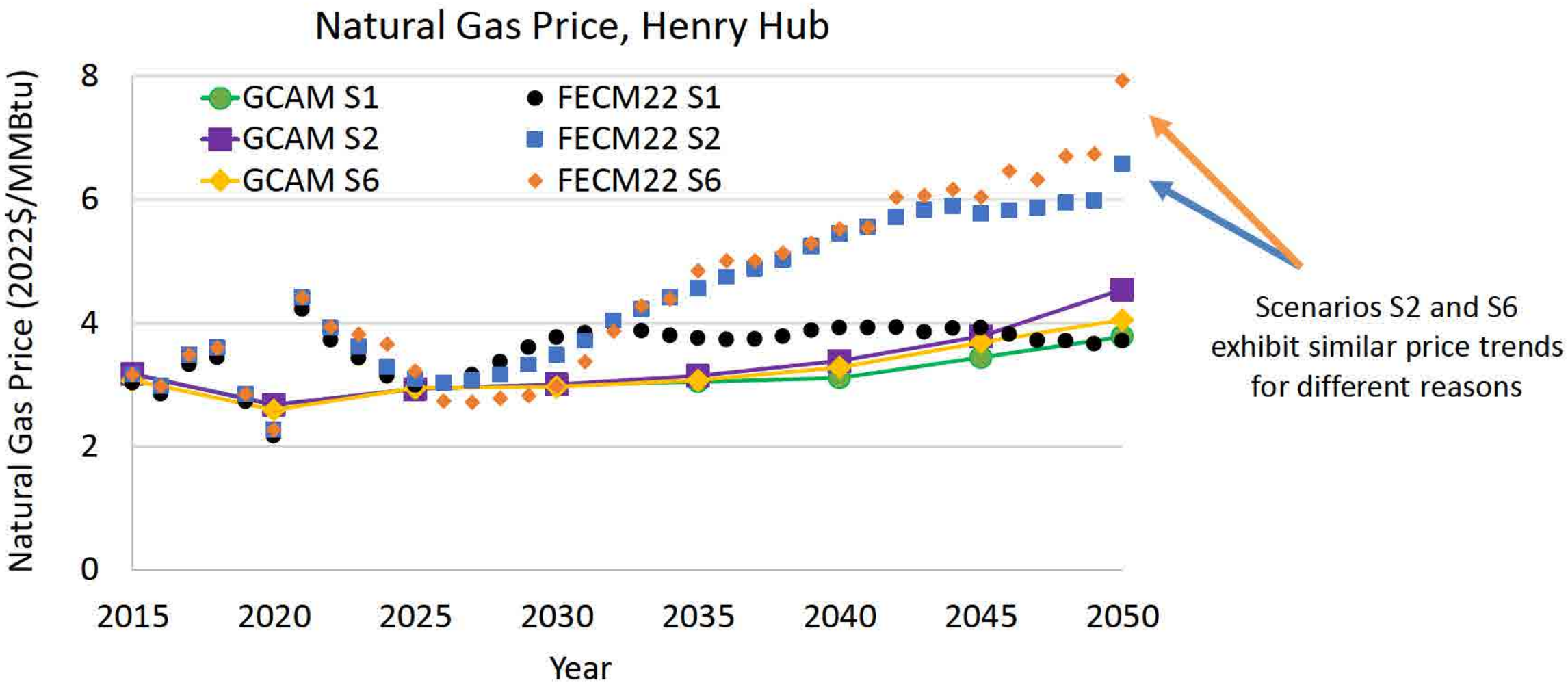




*No net-zero case for the AEO23 model


Henry Hub Natural Gas Price
2022 $/mmBtu
Year
0
1
2
3
4
5
6
7
8
2020
2025
2030
2035
2040
2045
2050
FECM22_S6.05
FECM22_S6_S
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48 bcf/d export target
38 bcf/d export target
28 bcf/d export target

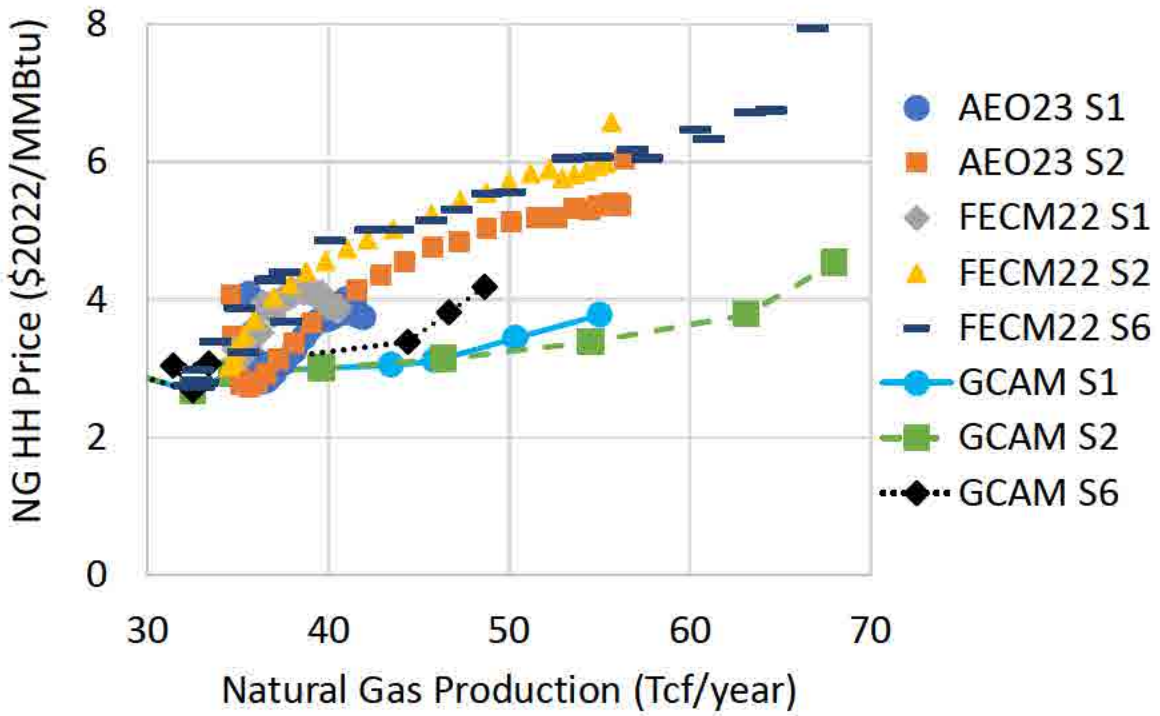
Note: These results are older and use the old NG supply curve

# Natural Gas Price, GCAM and FECM Comparison

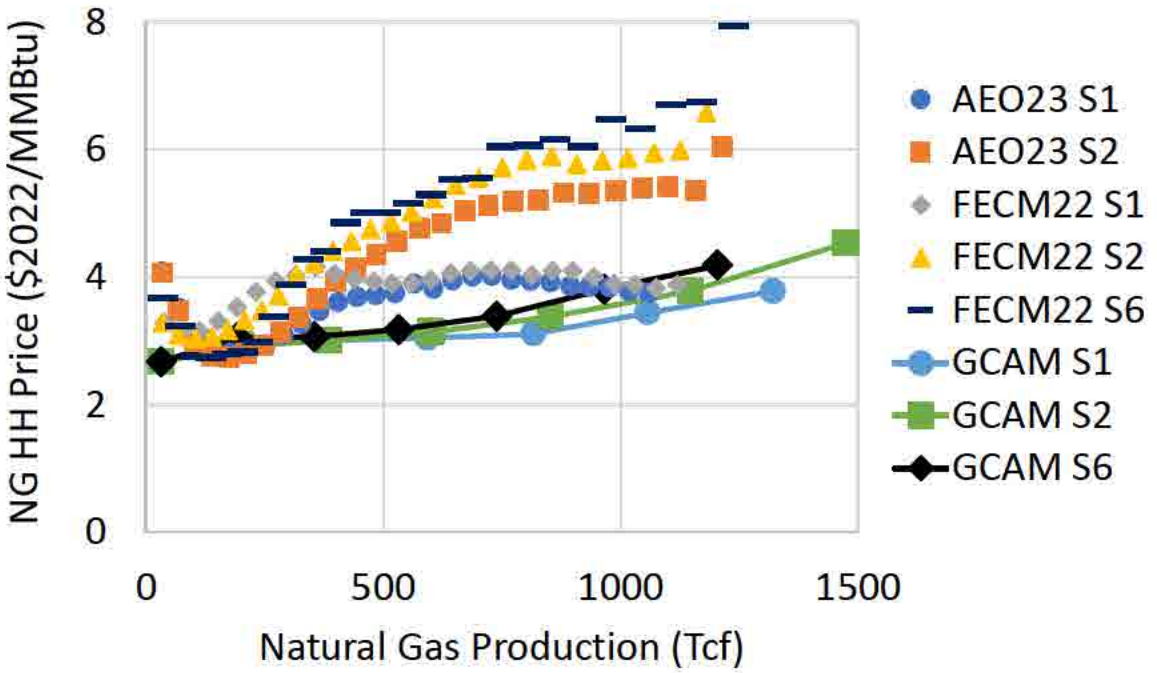


# Natural Gas Price/Supply Curve, Scenario Comparison

NG supply curve by model (Starting in 2024 to exclude historical and STEO years)



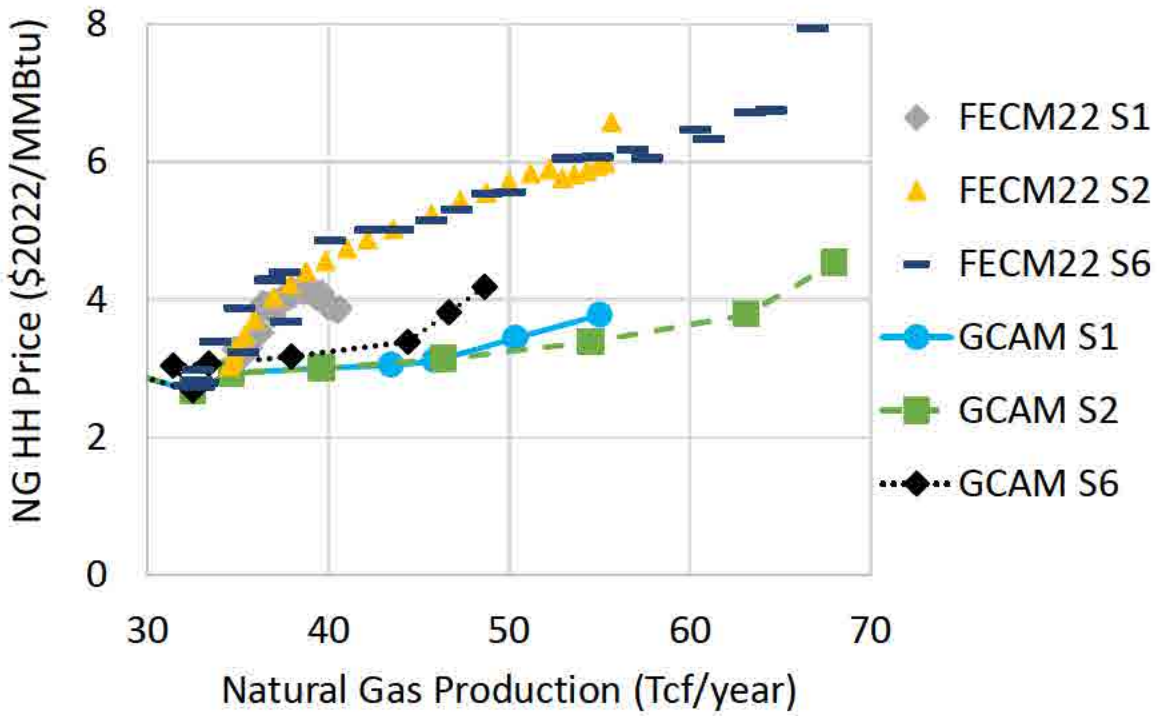

NG cumulative supply curve by model (Starting in 2024 to exclude historical and STEO years)



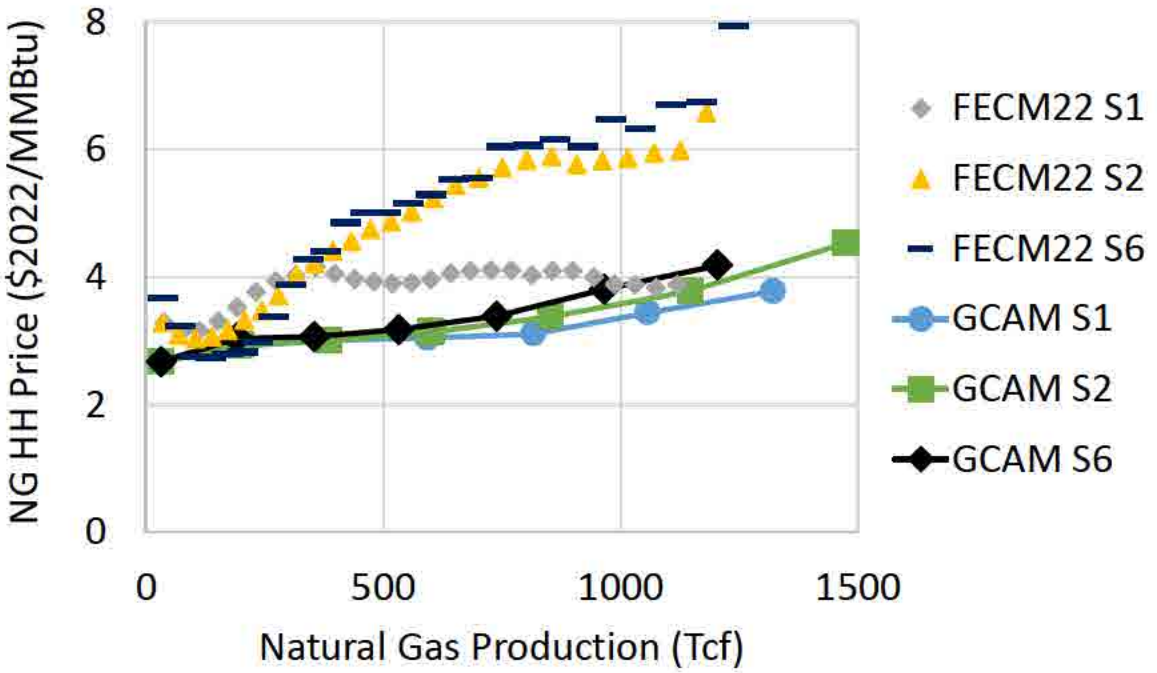

Note: These results are older and use the old NG supply curve

# Natural Gas Price/Supply Curve, Scenario Comparison

NG supply curve by model (Starting in 2024 to exclude historical and STEO years)




NG cumulative supply curve by model (Starting in 2024 to exclude historical and STEO years)




Note: These results are older and use the old NG supply curve

# Inflation Reduction Act in FECM-22

# Overview

- The Inflation Reduction Act (IRA) was passed in August 2022
  - Includes many important energy and climate provisions
- FECM-NEMS scenario includes the following:
  - Based on the AEO2022 low economic growth case
  - Includes many IRA provisions as well as several non-IRA policy and technology assumptions
  - FECM-NEMS includes many model enhancements to carbon management technologies including the addition of DAC and a hydrogen market module

# FECM Reference Scenario Assumption Summary

| | Technology & Pre-IRA Policy Updates | IRA Provisions |
|---|---|---|
| Economic Growth | AEO 2022 macroeconomic growth (real GDP average growth of 1.8%/year to 2050) | |
| Technology | | |
| Power (renewables and CCS) | NREL ATB Mod: Initial year (2027) and endogenous learning;<br>Update on CCS retrofits (not yet received) | |
| Transportation | Harmonized ANL Low (BAU): Initial year (2025) and endogenous learning | |
| Policy | | |
| Power | BIL CCS demonstration plants (includes subsidies for $CO_2$ pipelines and storage) | Clean Elec Credits (5X with no bonus credits), Zero Emission Nuclear Credits, 45Q |
| Hydrogen | none | 45V credits |
| Transportation | CAFE standards through 2026<br>EPA LDV stds & ZEV waiver | 30D, 45W, 70002 USPS Clean fleets |
| Buildings | none | 25C, 25D, 45L, 48D, 179D<br>IRA 50121, 50122, 50131 |
| Industry | BIL CCS demonstration plants for cement | 48D, 45Q, 50161 + 48C |

# Key Provisions of the Inflation Reduction Act

- The FECM-NEMS Baseline case includes major IRA energy-related provisions in each energy sector:
  - Power sector (e.g., clean energy PTC and ITC; zero emission nuclear credits)
  - Buildings sector (e.g., energy efficient home tax credits and rebate programs; building codes; PV credits)
  - Transportation sector (e.g., clean vehicle tax credits)
  - Refinery sector (e.g., extension of incentives for biofuels)
  - Hydrogen tax credits
  - Industrial sector (e.g., CCS and electrification options for cement, steel, glass, paper and aluminum)
  - Oil and gas royalty rate increases
  - Cross-cutting programs (extension of 45Q sequestration credits, EPA green bank, USDA programs)
- There are a few other energy-related provisions are more difficult to model, are not well defined, or impact technologies not currently represented in the model, so they were not included in the IRA case.
  - This may lead to an underestimation of the IRA impact.
  - On the other hand, the modeling may not reflect all the institutional and regulatory frictions that might slow or reduce the IRA impact, and thus lead to an overestimate of the impact.

# Non-IRA Modeling Updates

- The FECM-NEMS Baseline case includes the following non-IRA policy and technology assumptions that were not included in the AEO 2022:
  - Provisions from the Bipartisan Infrastructure Law (BIL):
    - Funding for carbon capture demos, and $CO_2$ transport and storage infrastructure
    - Advanced reactor demos – small modular reactors
  - Updated EPA/NHTSA CAFE standards
  - Updated state-based Zero-Emission Vehicle (ZEV) requirements to reflect the end of the moratorium on state programs (16 states)
  - Updated technology costs for power sector and electric vehicles with endogenous learning
- In addition, the Baseline case also uses FECM technologies and assumptions that include:
  - Industrial CCS with options to send captured $CO_2$ to EOR or saline storage
    - Industrial sources are ethanol, natural gas processing, hydrogen in refineries, and cement
  - BECCS retrofit option (coal with carbon capture and up to 49% biomass cofiring)
  - Direct Air Capture (DAC) technologies using electricity and natural gas or natural gas only
  - Updated coal and natural gas CCS capital costs and 95% carbon capture rate

# FECM-NEMS Enhancements in Completed Merged Model

- Industrial carbon capture, utilization and storage (CCUS) enhancements
  - Endogenous $CO_2$ capture at ethanol, hydrogen production at refineries, and natural gas processing
  - Cement Carbon Management
  - Updated Industrial $CO_2$ Resource and capture costs
- Direct Air Capture (DAC)
- CTUS enhancements
  - New pipeline network representation and updated pipeline and storage costs
- Coal retrofit with biomass cofiring and carbon capture and storage (BECCS)
- Representation of methane emissions associated with natural gas production and delivery
- Inclusion of fixed indirect GHG emissions vectors
- Addition of hydrogen as a fuel source
  - Creation of the Hydrogen Market Module (HMM)
  - Modifications to various sectoral modules to represent potential hydrogen use
  - Updates to CTUS to include the new HMM capture sites
- Policy updates for Bipartisan Infrastructure Law (BIL) and Inflation Reduction Act (IRA)

# Technology Assumptions

| | FECM-NEMS Baseline IRA Case | AEO 2023 Reference IRA |
|---|---|---|
| **Macroeconomic Growth** | AEO 2022 low macroeconomic growth (real GDP average growth of 1.8%/year to 2050) | AEO 2023 macroeconomic growth (1.9%/year average growth) |
| **Power Sector:** | | |
| Renewable technologies | NREL ATB 2022 Moderate case initial costs and endogenous learning (lower than AEO 2022) | Similar to AEO 2022 |
| New coal and gas CCS | NREL ATB 2022 Mid-Year Update Moderate case initial costs and endogenous learning (lower than AEO 2022) | Similar to AEO 2022 |
| EV charging load shape | more daytime charging than AEO 2022 | Same as AEO 2022 * |
| Coal power plant planned retirements | EPA NEEDS database (Oct 2022) | Form EIA-860, Annual Electric Generator Report (Sept 2022) |
| **Transportation:** | | |
| Light-duty vehicles (LDV) | Harmonized initial EV costs with ANL Low (BAU) case | Similar to AEO 2022* |
| Medium/Heavy vehicles (MHDV) | CARB base truck costs for fuel cell vehicles, EVs, diesel, CNG, E85, and gasoline (but using EIA battery costs), improved fuel economy ratio for EV and fuel cell relative to diesel vehicles based on ANL Low case | Similar to AEO 2022* |

* Still checking

# Non-IRA Policy Assumptions

| | FECM-NEMS Baseline IRA Case | AEO 2023 Reference IRA |
|---|---|---|
| **Transportation Policies:** | | |
| LDV EPA and CAFE standards | Updated EPA and NHTSA thru 2026 | Same as FECM IRA case |
| State ZEV mandates | Pre-existing program, but not Advanced Clean Cars II (100% targets) | Same as FECM IRA case |
| **Bipartisan Infrastructure Law:** | | |
| CO2 pipeline and saline subsidies | Lower transport and storage costs | Not included |
| CCS demos - industry | Applied to cement (1/3 of total funding) | Not included |
| CCS demos - power | Funding for coal retrofits and new gas CCS (50% cost share) | Not included |
| Advanced nuclear demos | Two 330MW SMR plants (WA, WY) | Not included |
| Civil Nuclear Credits | Included as in AEO 2022 | Same as AEO 2022 |
| Strategic Petroleum Reserve (SPR) | Included as in AEO 2022 | Same as AEO 2022 |

# IRA Policy Assumptions

| | FECM-NEMS Baseline IRA Case | AEO 2023 Reference IRA |
|---|---|---|
| **Power Sector:** | | |
| Clean Tech PTC and ITC credits | 5x credits, no extra bonus | Same as FECM IRA case |
| Zero Emission Nuclear Credits | Production tax credits available thru 2032 | Same as FECM IRA case |
| USDA rural coop programs | Funding for solar, wind, and CCS | Not included |
| **Buildings:** | | |
| Residential RE credits | ITC credits available thru 2034 | Same as FECM IRA case |
| Commercial RE and CHP credits | 5x ITC credits, no extra bonus | Same as FECM IRA case |
| Residential sector tax credits and subsidies | 25C, 25D, 45L, 50121, 50122, 50131 | 25C, 25D, 45L |
| Commercial sector tax credits and subsidies | 179D tax credits | Not included |
| EPA GHG Reduction Fund | Building retrofits and rooftop PV | Not included |
| **Industry:** | | |
| Industrial tax credits and subsidies | Various manufacturing credits for CCS, steel, cement, and other GHG reductions (48C, 50161, and Low-Carbon Procurement Provisions) | Not included |
| Battery manufacturing credit (45X) | Not included | Not included |

# IRA Policy Assumptions

| | FECM-NEMS Baseline IRA Case | AEO 2023 Reference IRA |
|---|---|---|
| **Transportation:** | | |
| LDV EV tax credits (30D) | Weighted credit (not all qualify) | Exogenous based on offline analysis |
| Commercial clean vehicle credit (45W) - freight trucks | Credits for EV and Fuel Cell Vehicles | Not included |
| Commercial clean vehicle credit (45W) - electric buses | Exogenous shares for electric school buses based on ICCT Moderate case | Not included |
| 70002 USPS Clean fleets | Included (exogenous min EV sales) | Not included |
| **Fuel Production:** | | |
| Hydrogen tax credits (45V) | Full 5X value | Not included |
| Biofuel tax credits | Extended thru 2024 (replaced by 45Z) | Extended thru 2027 |
| 45Z Clean Fuel Production Tech-neutral credit | 2025 thru 2027 | Simplified version for certain fuels |
| Sustainable Aviation Fuel Credit | Not included | Simplified version through 2027 |
| **Sectoral Cross-Cutting Programs:** | | |
| 45Q credits (EOR/saline/DAC) | $60 EOR/$85 saline/$180 DAC | $60 EOR/$85 saline (no DAC) |
| **Oil/Gas Production:** | | |
| Increased royalty rates | Implemented | Implemented |
| Completion of OCS leasing program by 2022 | Not included | Implemented |

# Schedule

## Complete for Internal DOE Review by Mid July

## Final Inter-agency Review by End Aug

## Final Report by End Sep

| | | PPNL and OL Teams | |
|---|---|---|---|
| weeks | w/o | Modeling efforts | Report Writing |
| 1 | 4/17/2023 | Decide on scenarios and align on key variables | |
| 2 | 4/24/2023 | GCAM and NEMS (AEO23 & FECM) coordination | D: Introduction and Scenario Design |
| 3 | 5/1/2023 | GCAM Run on Sce 1 to 6 | |
| 4 | 5/8/2023 | GCAM Run on Sce 1 to 6 and Review | D: Study Methodology & Key Assumptions |
| 5 | 5/15/2023 | PNNL pass results to OL and start NEMS runs | **D: International GHG Outcomes** |
| 6 | 5/22/2023 | NEMS Runs on Sce 1 - 6 | |
| 7 | 5/29/2023 | NEMS Runs on Sce 1 - 6 | |
| 8 | 6/5/2023 | NEMS Runs on Sce 1 - 6 | **D: U.S. Natural Gas Market Results** |
| 9 | 6/12/2023 | Review and comparison of NEMS and GCAM results | **D: U.S. GHG Outcomes & Econ??** |
| 10 | 6/19/2023 | Review and comparison of NEMS and GCAM results | |
| 11 | 6/26/2023 | Possible model adjustments and new runs | |
| 12 | 7/3/2023 | Possible model adjustments and new runs | |
| 13 | 7/10/2023 | GCAM and NEMS Final Results | Final Drafts |
| 14 | 7/17/2023 | | |
| | | | Appendices and Data Annexes |

**Key issues / items to consider / Action Items as of April 24, 2023**

- Set up meeting with Michael Blackhurst to review more details on technology and GHG results
- Write draft rational for using LNG export capacity figures in Scenario 1 for AEO 2023 and FECM-NEMS.
- Draft annotated outline for Modeling Report for NEMS and GCAM and share with PNNL and LCA Teams
- Coordinate on key data results across scenarios 2-5.
- Align on natural gas between NEMS and GCAM in Scenario 1
- Evaluate between scenarios 3 to 5, for high and low LNG Export
- Align in IRA assumption across GCAM, AEO 23, and FECM-NEMS (FECM acknowledge/confirm IRA implementation)
- Align on tech assumptions (NREL Low Cost ATB) on #5 between GCAM and FECM-NEMS
- Evaluate GCAM global and regional GHG emission changes across scenarios
- Careful coordination and consideration on #6 between GCAM and FECM-NEMS ($H_2$, DAC, non-NEMS GHGs, others?) and GCAM inputs to NEMS on scenario 6 for non-CO Non-CO2 & Landuse

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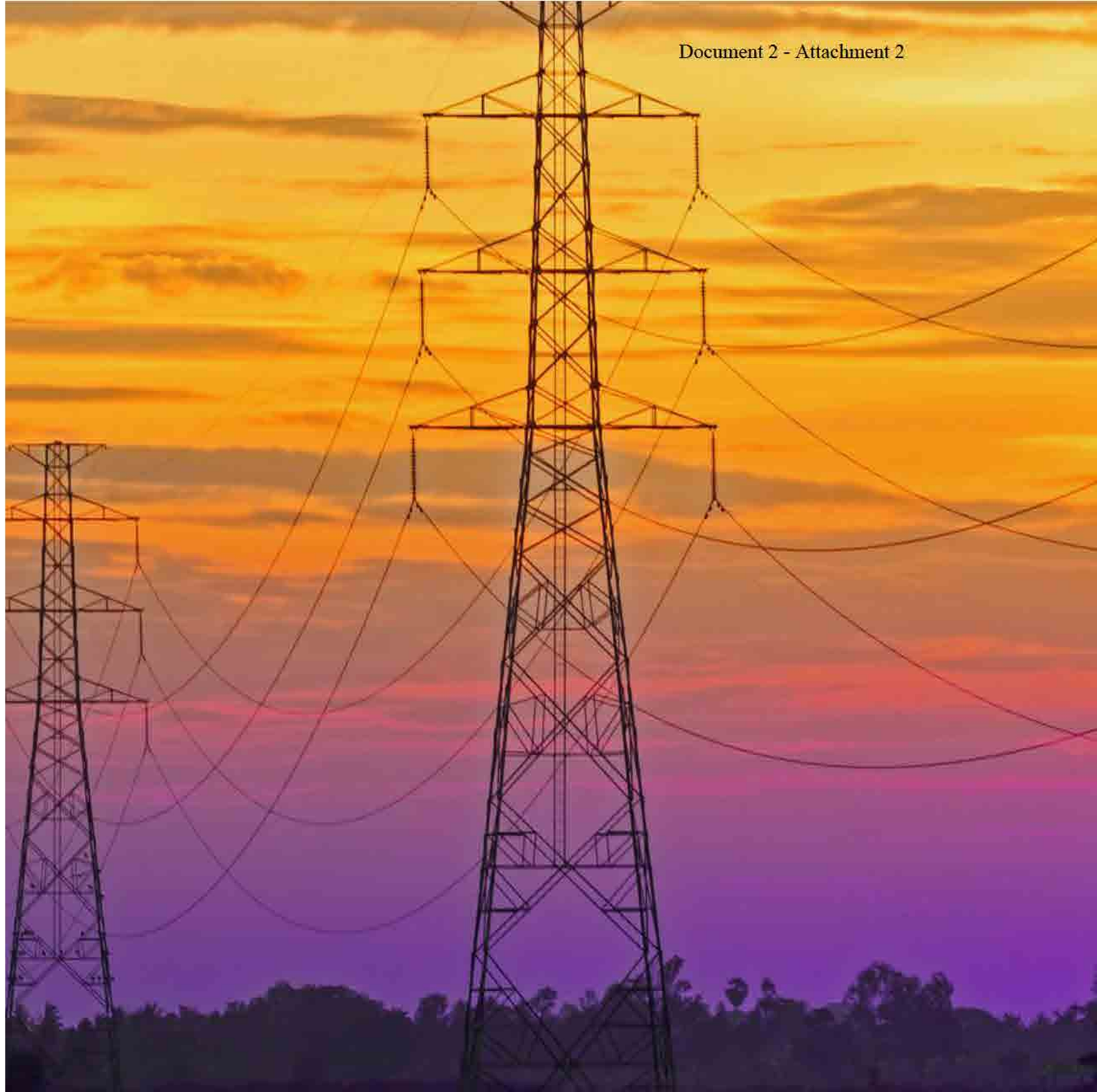
# Long-term scenarios of U.S. and global liquefied natural gas markets

May 26, 2023

**Gokul Iyer, Paul Wolfram, Brinda Yarlagadda, Matthew Binsted, Jae Edmonds**

U.S. DEPARTMENT OF ENERGY BATTELLE

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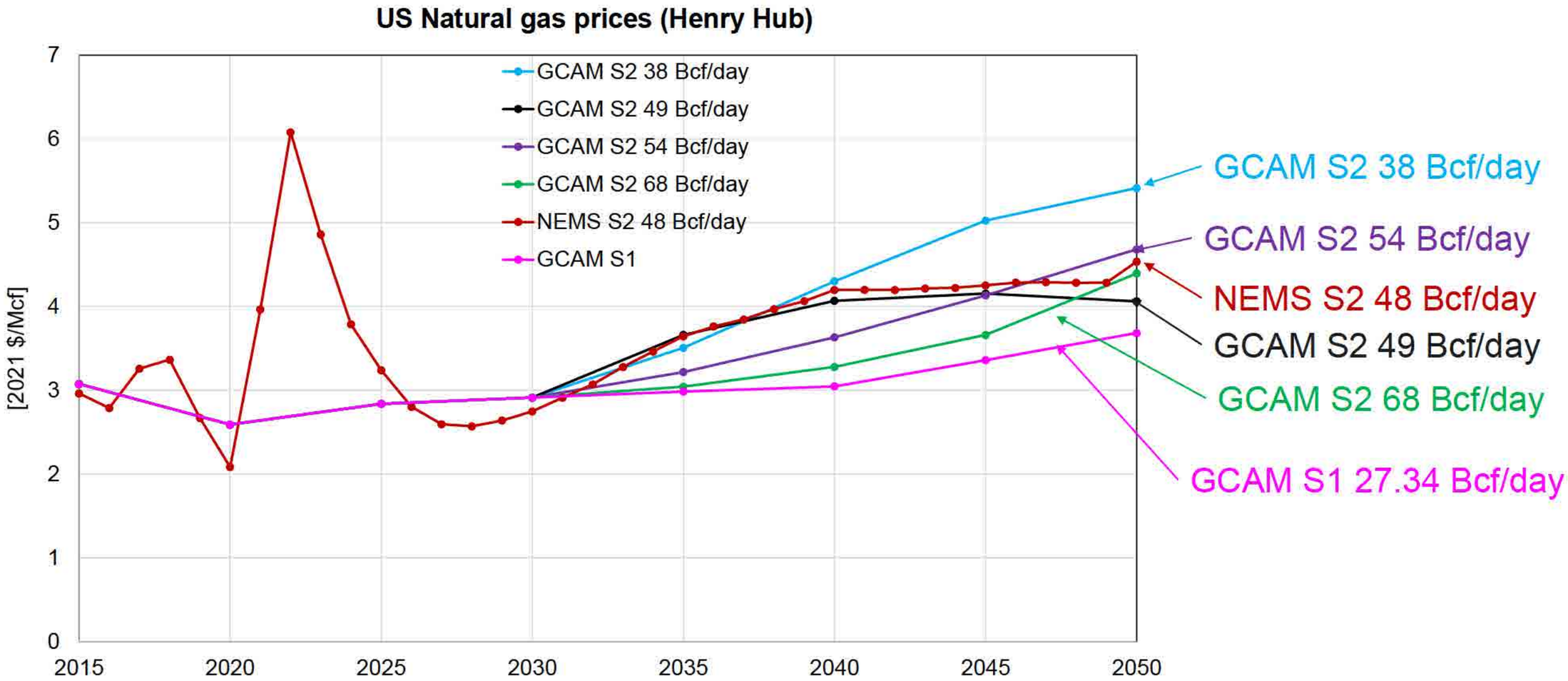
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# Summary of progress updates

- First draft of all scenarios complete
- US LNG export constraint in S1 revised to 27.34 Bcf/day
- US gas prices in scenarios S2-S5
  - Tried out several price paths and think we are close to convergence between the two models
- Scenario S6
  - US GHG emissions are net-zero in 2050 (we were previously overachieving by ~0.5GtCO2e)
- International prices
  - We have looked at the data from FECM and have some clarifications

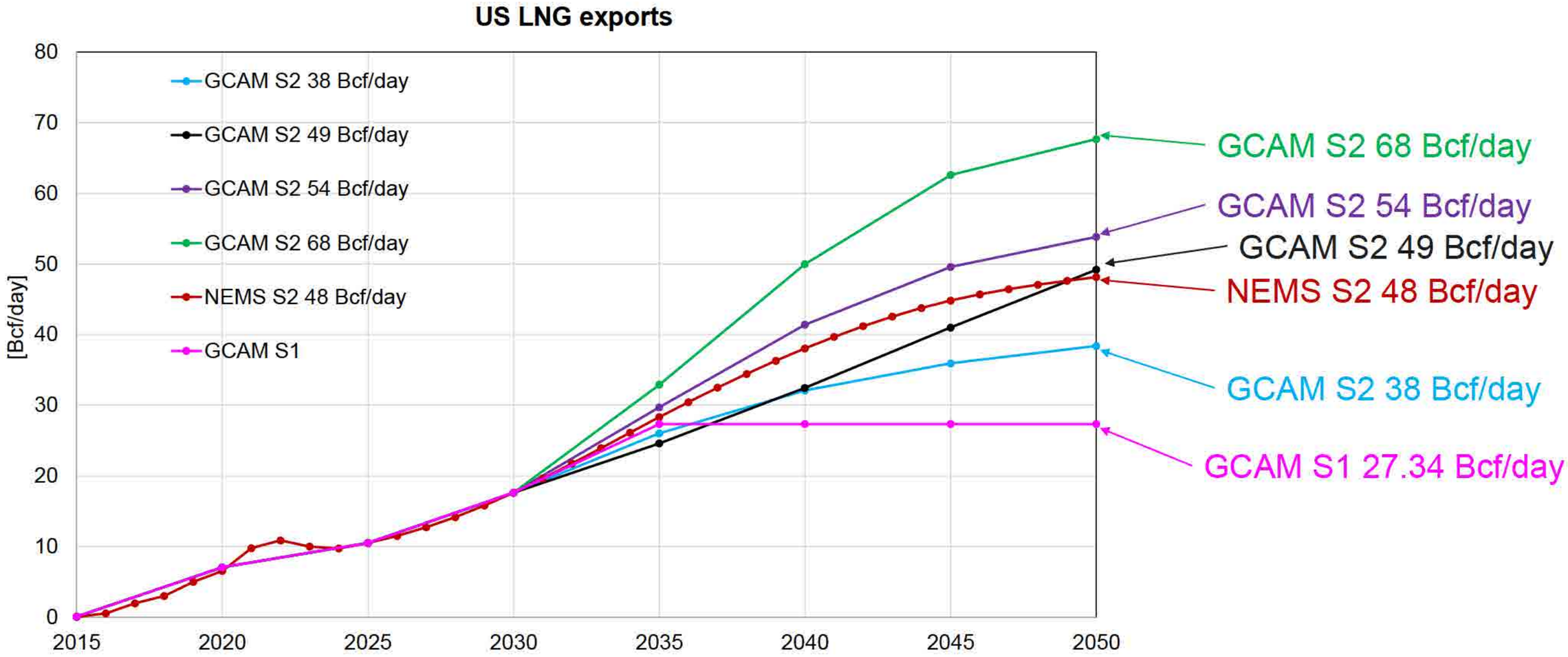
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# US natural gas price sensitivities



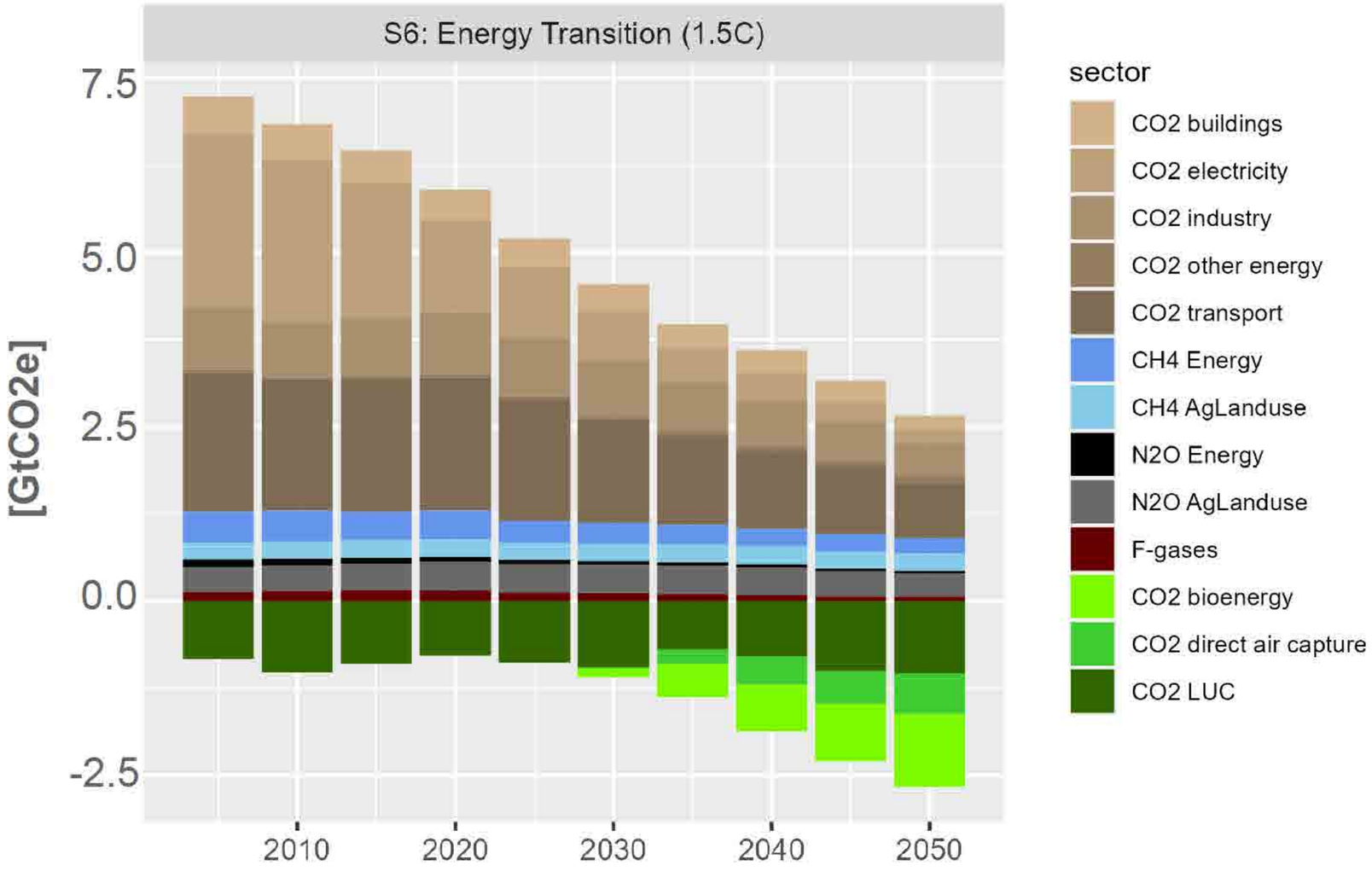
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# US LNG exports



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# US Emission by sector under S6



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# International prices

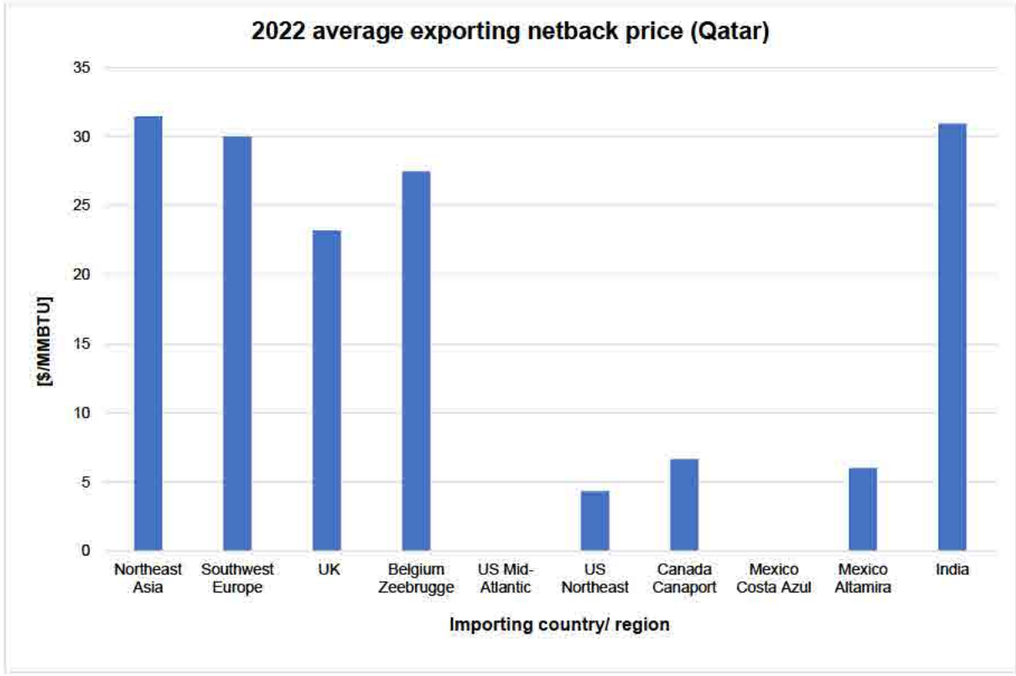
- Thanks to FECM for international price data
- Price data from FECM could be used to calibrate historical gas producer prices for GCAM regions
- For importing regions, we could use CIF import prices from S&P as a proxy for the regional producer price
  - The logic here is that if markets are in equilibrium, the regions should be importing at a price equivalent to their domestic production price.
  - The S&P global dataset includes CIF data for key importers including: Japan, South Korea, Taiwan, Thailand, China, Spain, Italy, Greece, Brazil
  - We're still thinking about how to use this data for an aggregate region like Southeast Asia, which comprise key exporting countries (e.g. Malaysia), but also many importing countries

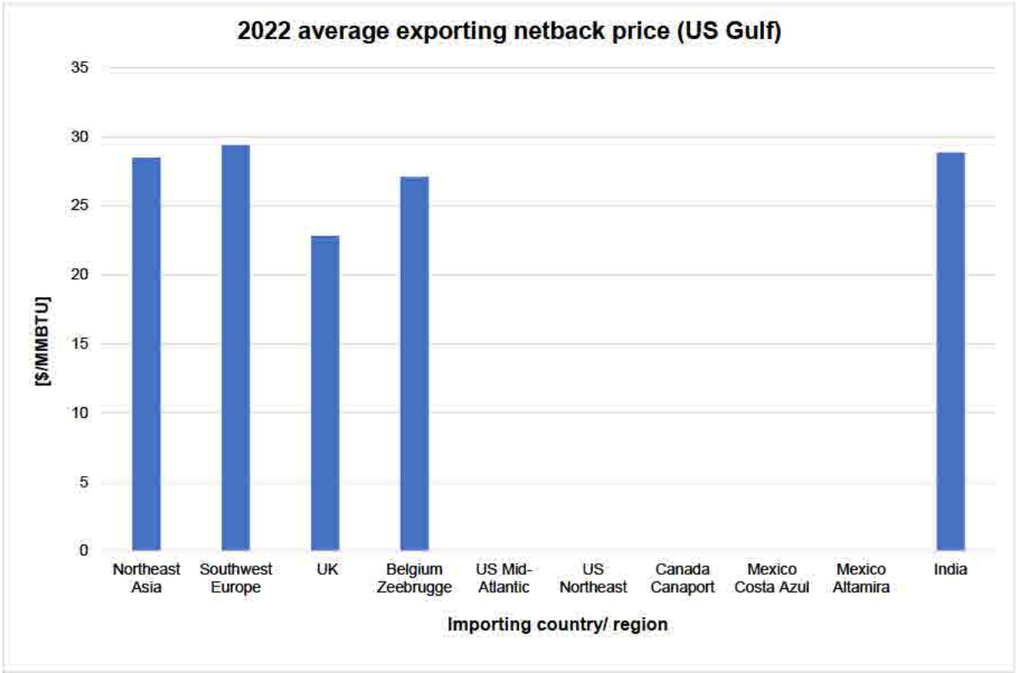
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# International prices

- For exporting regions, we were thinking of using netback prices from EIG as a proxy for the producer prices, but we have a couple of questions
  - Do the EIG netback prices include liquefaction costs?
  - If they do and if we were to back out liquefaction costs, using netback prices seem challenging because:
    - ✓ The price variation across importing countries/regions is very high in some cases (e.g. Qatar)
    - ✓ In the case of the US, netback prices seem much higher than the Henry Hub prices (~6.5 $/MMBTU), so they seem to include profit margins, which also seem to vary across importing regions



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# Next steps

- Complete US price harmonization for S3, S5 and send data to OnLocation
  - Since GCAM's US LNG exports under S3 and S5 are close to S2, we will use S2 prices from NEMS to harmonize S3 and S5 prices
- For S4, GCAM's US LNG exports under S4 are close to S1 and hence we don't think any price harmonization is required (since S1 prices are already well-aligned across GCAM and NEMS)
- For S6, we will conduct price harmonization after we've made more progress on other harmonization efforts
- Begin to implement international prices

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# Thank you

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**From:** Skone, Timothy
**Sent:** Thu, 17 Aug 2023 15:03:10 +0000
**To:** Matthews, Howard Scott (CONTR)
**Cc:** Jamieson, Matthew B.
**Subject:** RE: graphs
**Attachments:** FECM_LNG_Analysis_Briefing_18Aug_GI.pptx

Scott and Matt,

Some thoughts on data display needed for this effort. I only outlined my thoughts for the first few levels of data. Let me know if you need more detail to complete the intent for all levels of data transparency. The key is to align to and support the lowest level of indexing required while also fully explaining where and at what magnitude the market effect occurred down to the technology change within an economic sector within a country.

Let me know if you would like to discuss. For Friday – showing the levels of data transparency envisioned to support the Global Market Effect results (consequential adder) would be good.

Also -do you have the NEMS Domestic data from Paco? My assumption is that US GHG emissions go up with LNG exports as we are taking away gas resources from US customers to send it oversees. This should affect the conclusion of -6 by adding a positive market effect. I have not seen any NEMS data so this is an assumption at this point.

The list below seems long, but I think we/you have all the data to provide full transparency. Happy to discuss what makes sense and then run options past Tom if needed.

Tim

Objective: to clearly explain how the market changes in response to increased US LNG exports.

1. GCAM may provide this answer. The attached summary deck unfortunately does NOT go into sufficient granularity to provide this answer.
    a. It does provide the following levels of granularity:
        i. Slide 13 (S13) Change by Country: 13 levels
        ii. S14 shows "global primary energy consumption by fuel" oil, oil ccs, gas, gas ccs, coal, etc. This data tells us the amount of energy by type consumed to produce an energy service (power, heat, and cooling). This is not the amount of final energy consumed by the end user.
        iii. S14 shows the global GHG emissions by sector – divided by CO2, CH4, and N2O and divided by economic sector – however – the data aggregation levels are not the same by pollutant species. There is more detail for CO2 and less for CH4 and N20.
            1. Question: Can GCAM only produce results for CH4 at two levels: Energy and Agriculture? I thought they had more data to break this out.

We need to show data down to the level of our indexing approach. I am thinking multiple tables that walk the reader through the levels of data aggregation so they can understand how the Global Market Effect value was determined based what the change in the market from GCAM and NEMS results.

Two parts: Domestic Market Effects and International Market Effects equals Global Market Effect.

G = Global
D = Domestic
I = International

General Levels of Aggregation (tabular results):

1. Global, GHG Emissions
    a. Total GHG Emissions
    b. Scaled per unit of US LNG Exports
2. Country, GHG Emissions
3. Country, Natural Gas Sector Details
    a. Energy Flows
    b. GHG by NG sector
4. Country, Economic Sector Energy Consumption & GHG Emissions
5. Country, Economic Sector Energy Consumption & GHG Emissions, Technology/Primary Fuel
6. Country, Economic Sector Technology/Primary Fuel , GHG Speciation: CO2, CH4, N20, Other GHGs.
    a. Data needs to determine at what level GHG speciation makes sense to report.

Note: All tables and graphs in the report can be based on the 5-year time increments (7 time steps): 2020, 2025, 2030, 2035, 2040, 2045, 2050
Note: all report graphs will need a supporting table in an Appendix.
Note: all supporting tables in the Appendix need to include the complete data set by year to support the SCC. 2020, 2021, 2022…2050.
Note: data needs to show values for S1, S2, S2-S1, Percent Change relative to total International GHG change (s2-s1).

Note: we will need to repeat the data for three sets: (1) raw GCAM Data, (2) Index to US NG GHG relevant profile for all GCAM Data, (3) Adjusted GHG data aligned to the NETL GHG data. I am thinking a consistent example in the report with the supporting detail/tables in an appendix.

**Level G-1 Domestic versus International GHG Market Effect by Year (7 time steps)**
This could be a cumulative area graph or table.

**Level I-2 Country: GHG Emissions (AR5, 100-year)**
Show all 32 geographical categories in GCAM. Include summary rows in the table to align with Slide 12/GCAM 13 levels of geographic resolution. This will help ensure alignment between the GCAM summary data graphs and the detailed data breakout for the LCA work.

**Level 1-3 Country: Natural Gas Balance: Production, Consumption, LNG Export, Pipeline Gas Export, LNG Import, Pipeline Gas Import**
Reporting units: EJ should be the primary. It would be beneficial to generate sister tables in mass (MTPA) and volume (TCF); this will help improve the connection to the GCAM and NEMS chapters that show results in volume. I would report everything on an annual basis (not daily).

**Level I-3: Country: Natural Gas GHG Balance: Natural Gas Production, Gas Pipeline, Other Industrial**

This needs to align to the Index for replacing the GCAM data with the NETL data. Not sure I have the labels correct – FYI.

**Level I-4 Country: Economic Sector: GHG Emissions (AR5, 100-year)**
Data can be combined by broad geographical regions to reduce the table count and improve continental interpretation of changes.

I would also suggest creating a rule to aggregate country data with negligible change if true for the entire time series for results reported in the main body of the report (the appendix should have full transparency for all countries). Need to ensure that summing individual minor contributions by country does not cumulatively result in a significant contribution that then un-intentionally reduces transparency of the market effect.

*Need to follow the pattern for the remaining levels to obtain full transparency.*

---

**From:** Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Sent:** Wednesday, August 16, 2023 9:53 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** RE: graphs

No worries – just reminding you of the graphs we already had prepped and available. These have been shown to the broader team in June and/or earlier.

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Wednesday, August 16, 2023 4:37 PM
**To:** Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Cc:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** RE: graphs

Thanks Scott!

The graphs are not what I was thinking. I would not show these on Friday. I will try and offer some suggestions tomorrow.

Thanks,

Tim

---

**From:** Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Sent:** Wednesday, August 16, 2023 3:06 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** FW: graphs

Tim:

Attached are adder result graphics that Mike Blackhurst would have shown in June. The first is hard to interpret as is because there are some extreme values in there. But generally it is showing all individual annual adder results, color coded by scenario. It is not trying to show anything in a time series fashion.

If not distorted by the big exteme values (which take away all the resolution in what looks like a horizontal line at 0) it would be showing the adder as a function of LNG exported – and (again, without showing the year) merely try to show whether the adder is going up or down as more LNG hits the market

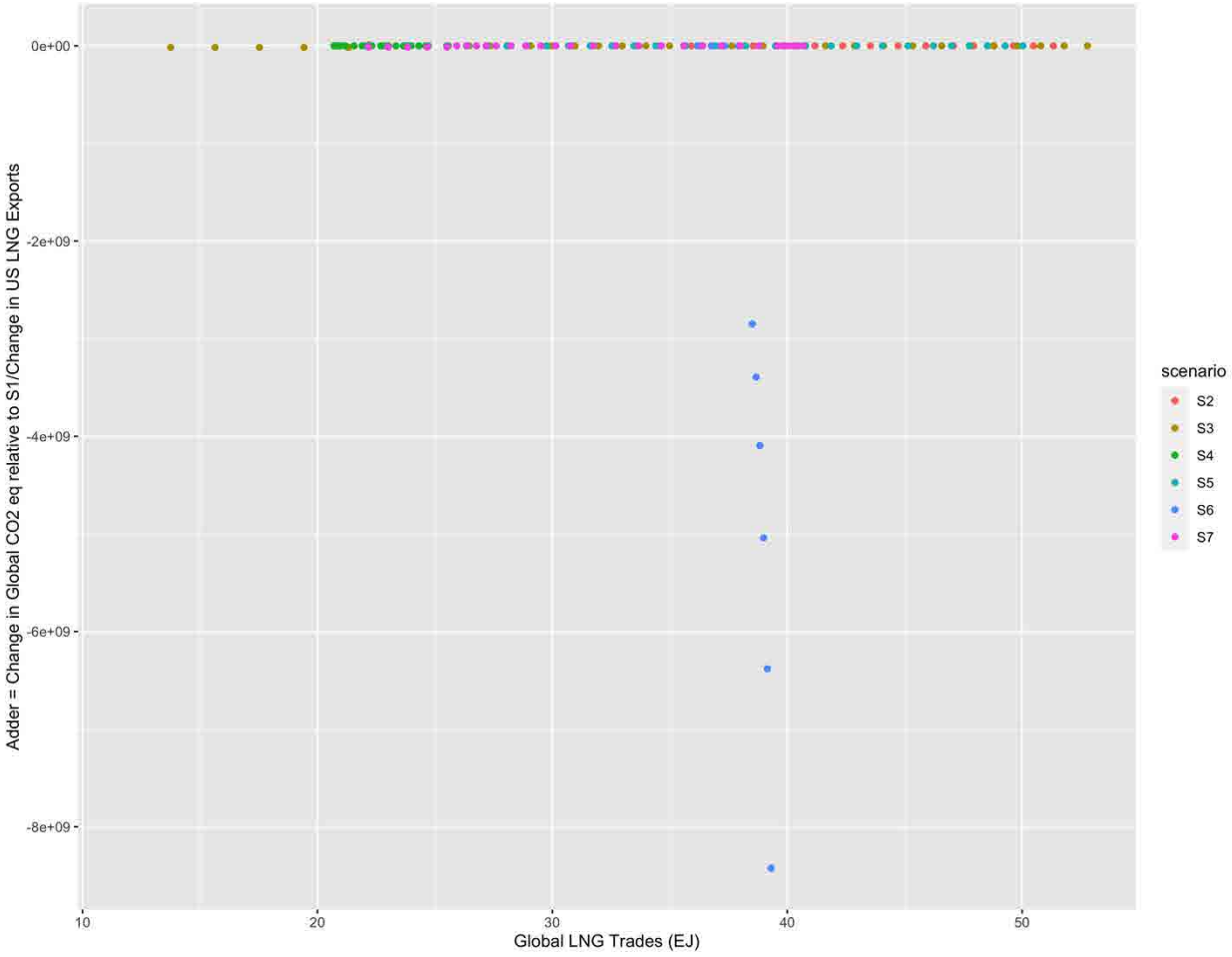
The second graph is a bit easier to see as is – its not the adder result per se, but the two components (numerator and denominator)

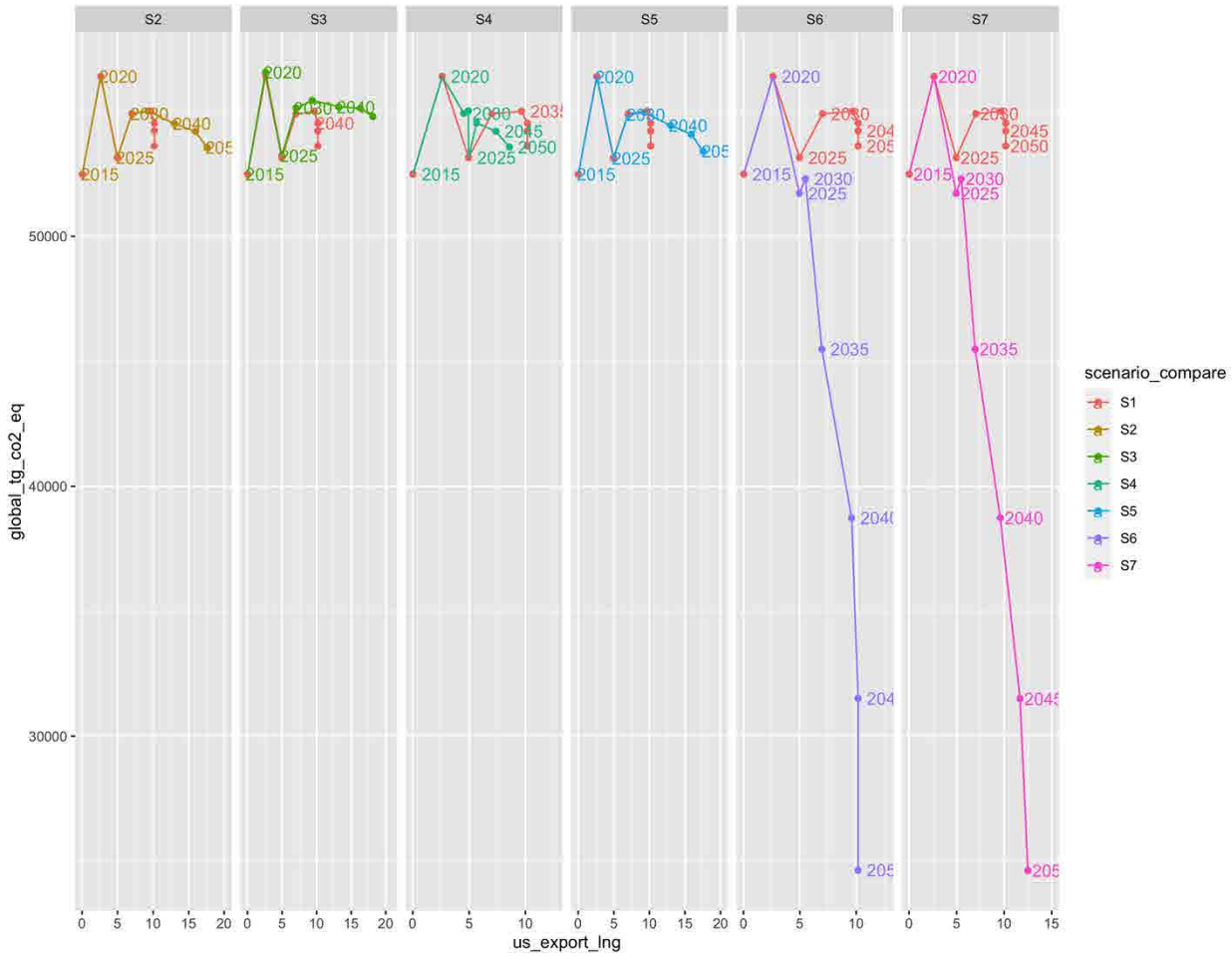
Anyway yell if you think we should be showing these, or other, results. If so can include them in discussion with Tom on Friday.

Scott

---

**From:** Scott Matthews <scott.matthews@keylogic.com>
**Sent:** Wednesday, August 16, 2023 3:00 PM
**To:** Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Subject:** [EXTERNAL] graphs


0e+00
-2e+09
-4e+09
-6e+09
-8e+09
Adder = Change in Global CO2 eq relative to S1/Change in US LNG Exports
10
20
30
40
50
Global LNG Trades (EJ)
scenario
S2
S3
S4
S5
S6
S7




Scott Matthews | **Principal Scientist**
he/him
m: (b) (6) | keylogic.com
3168 Collins Ferry Rd, Morgantown, WV 26505

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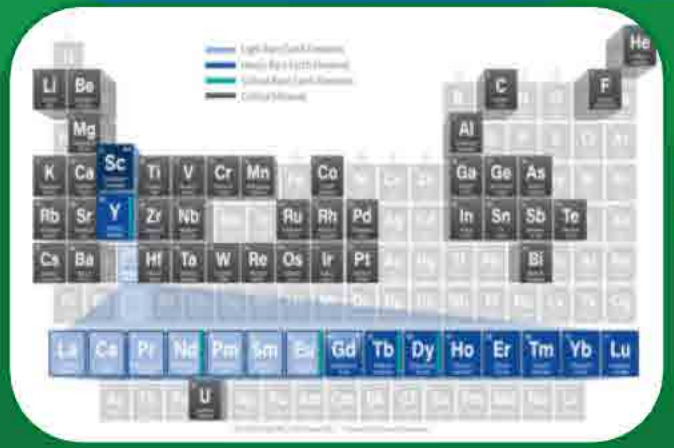
U.S. DEPARTMENT OF ENERGY
Fossil Energy and Carbon Management

# Updated Natural Gas Regulatory Analyses

**DRAFT – DELIBERATIVE – PRE-DECISIONAL**

August 18, 2023







# Agenda

**Introductions**

**Summary Review of Past and New Analyses (Amy)**

**Define Scenarios & Analyses Approach (Tom)**

**Key Findings (Gokul & Paco)**

**Next steps and timeline (Tom/Amy)**

# Current Basis for Regulatory Decisions

The Office of Resource Sustainability (ORS) within DOE's Office of Fossil Energy and Carbon Management (FECM) is updating analytical work in support of the natural gas regulatory program, specifically to support public interest reviews for exports of liquefied natural gas (LNG) sourced from the lower-48 states to non-free trade agreement (non-FTA) countries, where a public interest determination must be made.

Current studies in support of the natural gas regulatory program include:

- 2018 Economic Analysis prepared by NERA Economic Consulting
- 2019 GHG Life Cycle Analysis and 2014 GHG Life Cycle Analysis by NETL
- 2014 Addendum to Environmental Review Documents by NETL

Additionally, FECM published an Alaska-specific Supplemental Environmental Impact Statement examining the potential upstream environmental effects associated with incremental natural gas production on the North Slope of Alaska to support Alaska LNG's authorized exports of LNG:

- 2023 Alaska LNG SEIS

# Updated Analyses

Focus of this briefing

| Task | Description | Status |
|---|---|---|
| 1. **Global Market Analysis** | Pacific Northwest National Laboratory (PNNL) used the Global Change Analysis Model (GCAM) to analyze several global energy use and emissions scenarios. | Analysis Completed; working on final draft report. |
| 2. **Domestic Economic Analysis** | OnLocation modeled domestic impacts with customized versions of the National Energy Modeling System (NEMS). | Analysis Completed; working on final draft report. |
| 3. **Life Cycle Analysis** | NETL developed a consequential life cycle analysis (LCA) of the GHG emissions associated with the change in LNG exports across scenarios. | Analysis in final review; working on draft report. |
| 4. **Environmental Review** | NETL updating the 2014 review of environmental issues associated with natural gas development. | Completed final draft report, currently being reviewed by FECM. |

**Target date:**

- **End of September:** Publish summary report and supporting documentation for public comment.

# Scenarios (larger or smaller font)

| Scenario | Description | U.S. LNG Export Volumes |
|---|---|---|
| **S1: Reference Capacity** | Reference scenario that follows EIA's 2023 Annual Energy Outlook (AEO) including U.S. policy assumptions (including the 2022 Inflation Reduction Act). Assumes existing policies and measures, globally. | Grows to 27.34 Bcf/d by 2050 |
| **S2: Market Response** | Assumes policies consistent with S1 and an economic solution for LNG exports. | GCAM Market Response |
| **S3: High Global Demand** | Same assumptions as S2, economic solution for LNG exports, but higher assumed population growth outside of the U.S. | |
| **S4: Regional Import Limits** | Same assumptions as S2, economic solution for LNG exports, but constraints on importing and exporting natural gas with a global focus to maximize use of domestic gas. | |
| **S5: Low-cost Renewables** | Same assumptions as S2, economic solution for LNG exports, but lower capital costs for renewable energy technologies. | |

# Scenarios – cont.

| Scenario | Description | U.S. LNG Export Volumes |
|---|---|---|
| **S6: Energy Transition (Ref Cap)** | Assumes an emissions pathway consistent with a global temperature change of 1.5°C by end of century. Countries' emissions are constrained to announced GHG pledges, including the U.S. following a path to net-zero GHG emissions by 2050. NEMS follows $CO_2$ emissions constraint from GCAM. U.S. LNG exports are limited to the values from the AEO 2023 Reference scenario. | Grows to 27.34 Bcf/d by 2050 |
| **S7: Energy Transition (Mark Resp)** | Same emissions pathway assumptions as S6 but economic solution for U.S. LNG exports. | GCAM Market Response |

*S6 and S7 are not possible to model using EIA's version of NEMS, we are using a version of NEMS developed by FECM for S6 and S7.

# Scenarios

| Scenario | Description | U.S. LNG Export Volumes |
|---|---|---|
| **S1: Reference Capacity** | Reference scenario that follows EIA's 2023 Annual Energy Outlook (AEO) including U.S. policy assumptions (including the 2022 Inflation Reduction Act). Assumes existing policies and measures, globally. | Grows to 27.34 Bcf/d by 2050 |
| **S2: Market Response** | Assumes policies consistent with S1 and an economic solution for LNG exports. | GCAM Market Response |
| **S3: High Global Demand** | Same assumptions as S2 but higher assumed population growth outside of the U.S. | |
| **S4: Regional Import Limits** | Same assumptions as S2, but constraints on importing and exporting natural gas with a global focus to maximize use of domestic gas. | |
| **S5: Low-cost Renewables** | Same assumptions as S2, economic solution for LNG exports, but lower capital costs for renewable energy technologies. | |
| **S6: Energy Transition (Ref Cap)** | Assumes an emissions pathway consistent with a global temperature change of 1.5°C by end of century. Countries' emissions are constrained to announced GHG pledges, including the U.S. following a path to net-zero GHG emissions by 2050. NEMS follows $CO_2$ emissions constraint from GCAM. U.S. LNG exports are limited to the values from the AEO 2023 Reference scenario. | Grows to 27.34 Bcf/d by 2050 |
| **S7: Energy Transition (Mark Resp)** | Same emissions pathway assumptions as S6 but economic solution for U.S. LNG exports. | GCAM Market Response |

*S6 and S7 are not possible to model using EIA's version of NEMS, we are using a version of NEMS developed by FECM for S6 and S7.

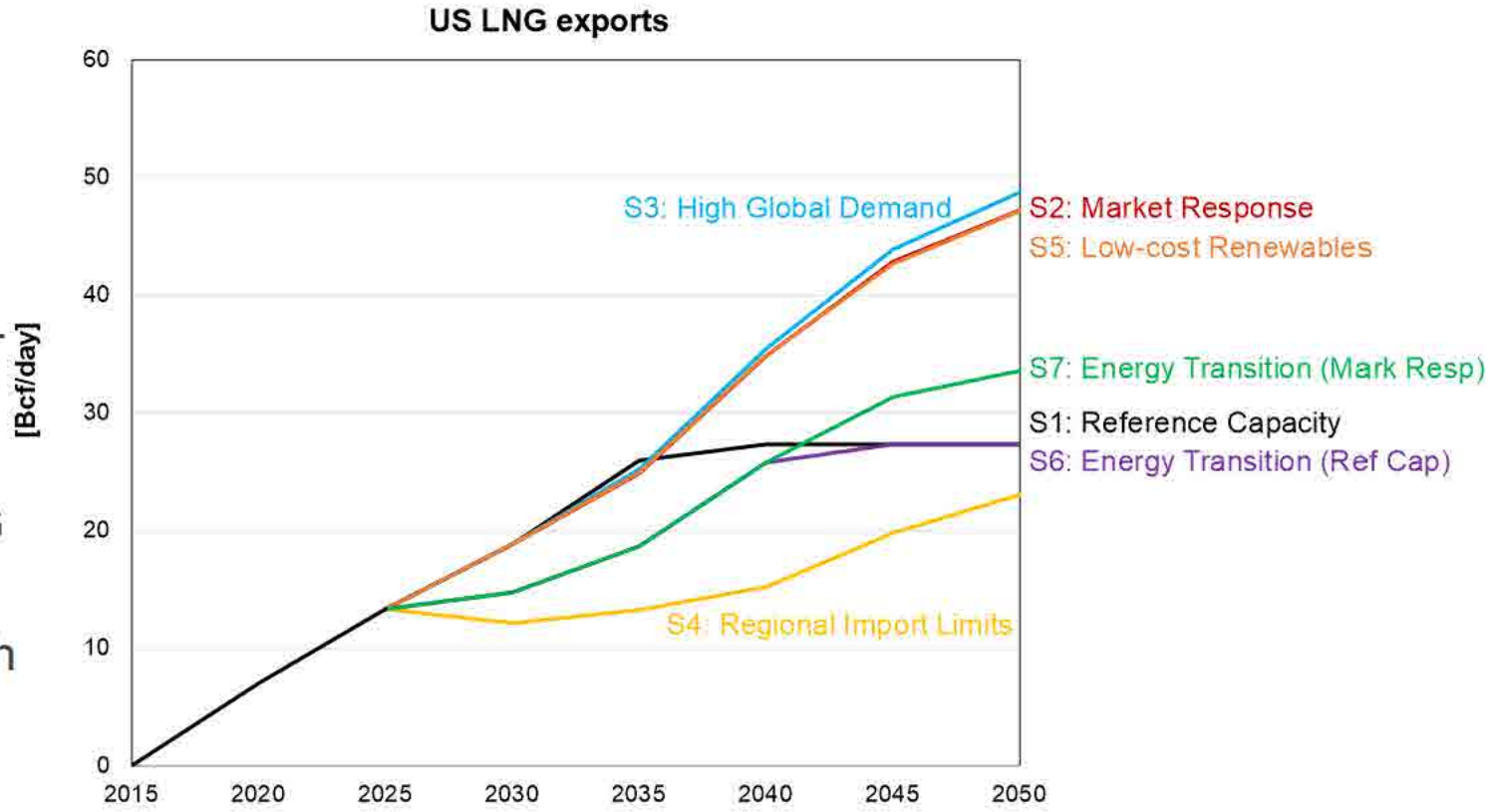
# Key Takeaways (Insights?)

- U.S. LNG exports continue to grow beyond existing and planned capacity in all modeled scenarios through 2050.
- U.S. $CO_2$ emissions do not change significantly across scenarios (except S6 and S7 that assume a global 1.5°C consistent pathway).
- When compared to a scenario in which U.S. LNG exports follow AEO-2023 (S1), a scenario that assumes economically-driven LNG export outcomes (S2) results in:
  - Significant growth in U.S. LNG exports
  - Little change in global GHG emissions and global gas consumption
  - Moderate increases in U.S. natural gas prices (2050 prices projected to increase from $3.74/MMBtu to $4.95/MMBtu. Previous study, at lower export levels, projected 2050 prices above $6.00/MMBtu.)
- Under a global energy transition consistent with meeting a 1.5°C target and economically-driven LNG export outcomes, U.S. LNG exports continue to grow through 2050 – albeit at a slower rate compared to the scenario without the 1.5 °C target – driven by increased demand for gas in combination with CCUS in the power and industrial sectors and to support direct air capture operations for atmospheric $CO_2$ removal.

# Global (GCAM) & Domestic (NEMS) Results

# U.S. LNG Exports outcomes from GCAM global scenarios

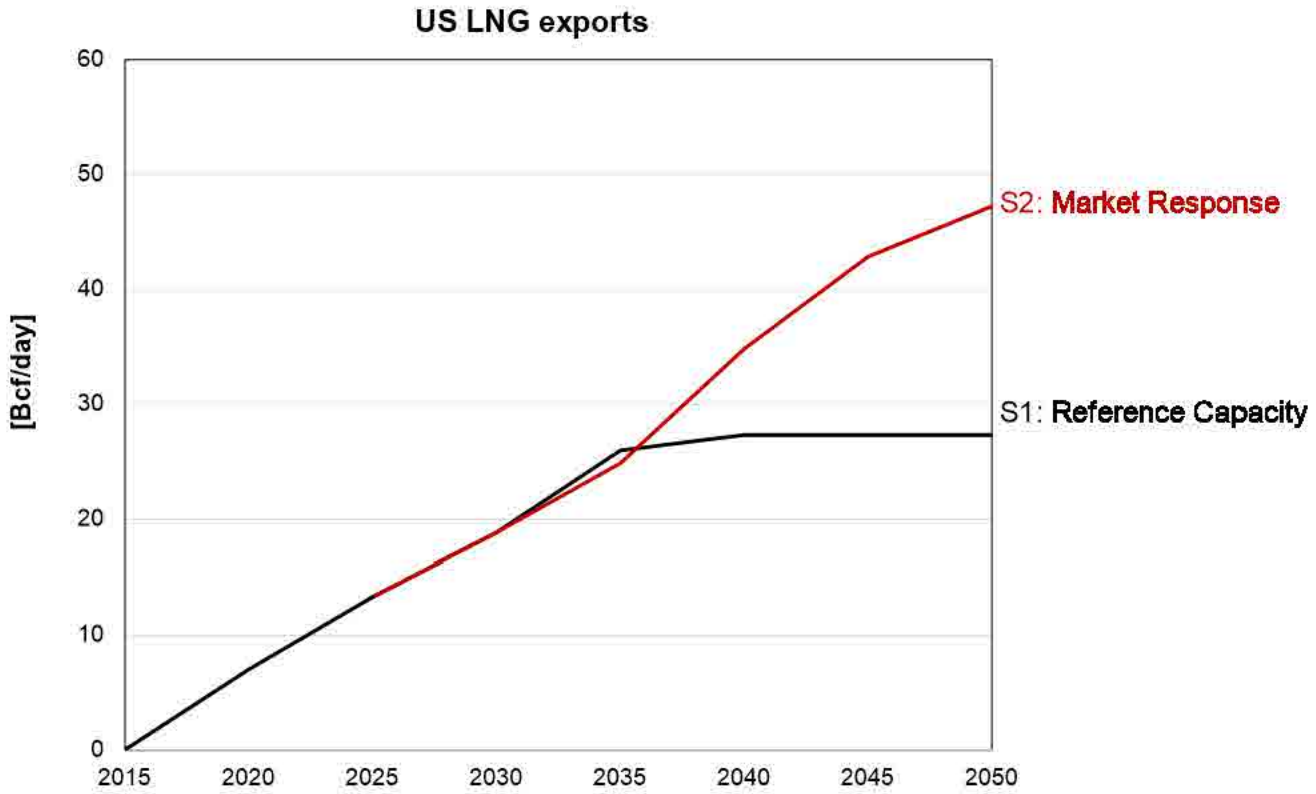
- U.S. LNG exports increase beyond existing and planned capacity in all scenarios by 2050 (except S1 and S6 which follow the AEO 2023's Reference case)
- In all scenarios, the U.S. is a net exporter of natural gas
- Under a scenario that assumes economically-driven outcomes, U.S. LNG exports increase to ~47 Bcf/day in 2050
- Under the *Energy Transition* scenario with economically-driven outcomes (S7), U.S. LNG exports increase to ~34 Bcf/day in 2050




*Note: All scenarios include a constraint on Russian exports*

# U.S. LNG Exports outcomes from GCAM global scenarios

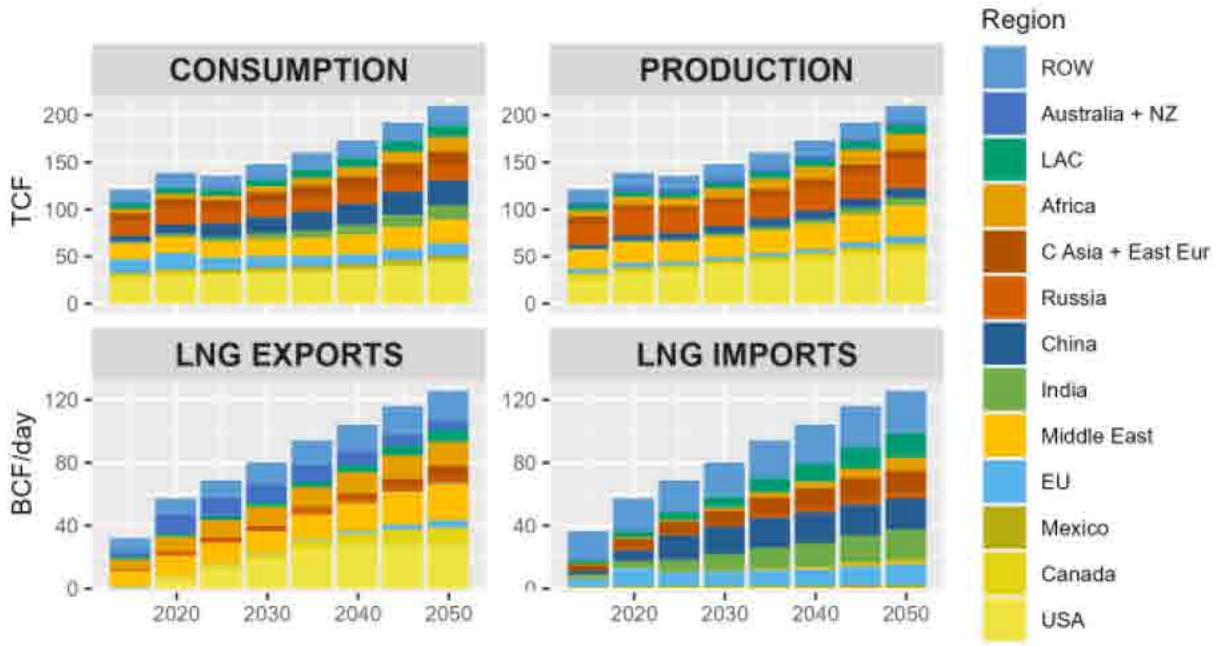
- The next few slides will focus on *S1: Reference Capacity* and *S2: Market Response*




*Note: All scenarios include a constraint on Russian exports*

# Global natural gas consumption, production, & trade under the S1: Reference Capacity scenario

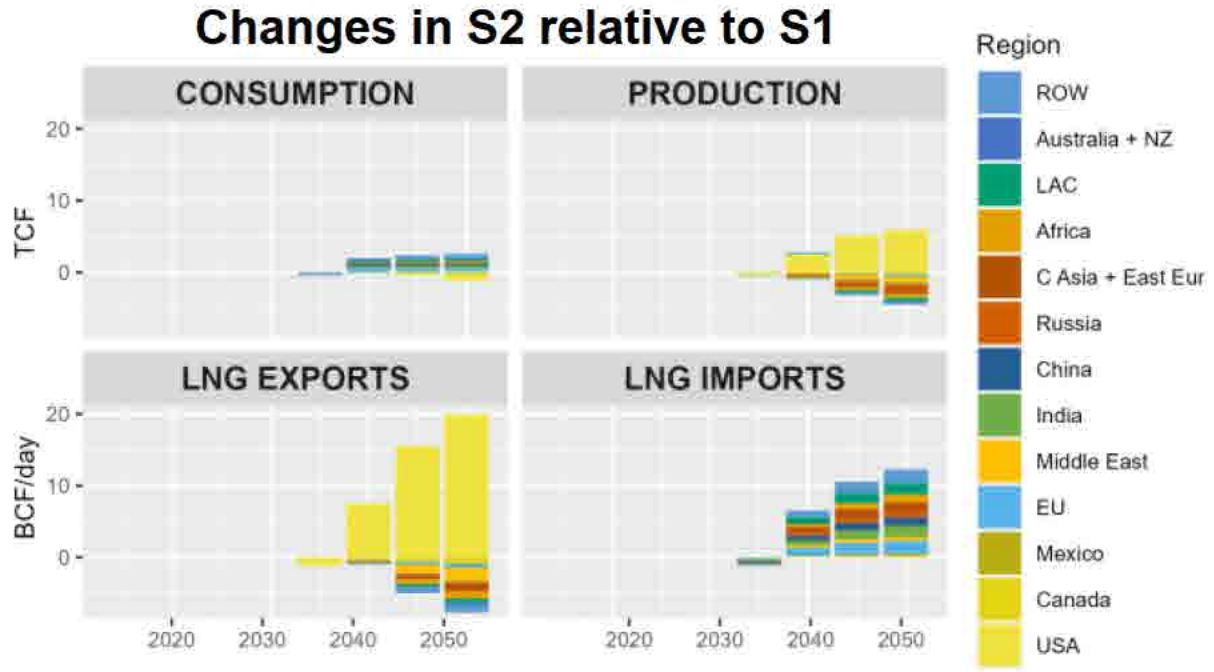
- Under the *S1: Reference Capacity* scenario, consumption and production of natural gas, and LNG trade increase in all regions across the globe driven by growing demands in the electricity, industrial, and buildings sectors




*Note: Units on top two panels are TCF and bottom two are Bcf/day*

# Global natural gas consumption, production, & trade (changes) under S2: Market Response

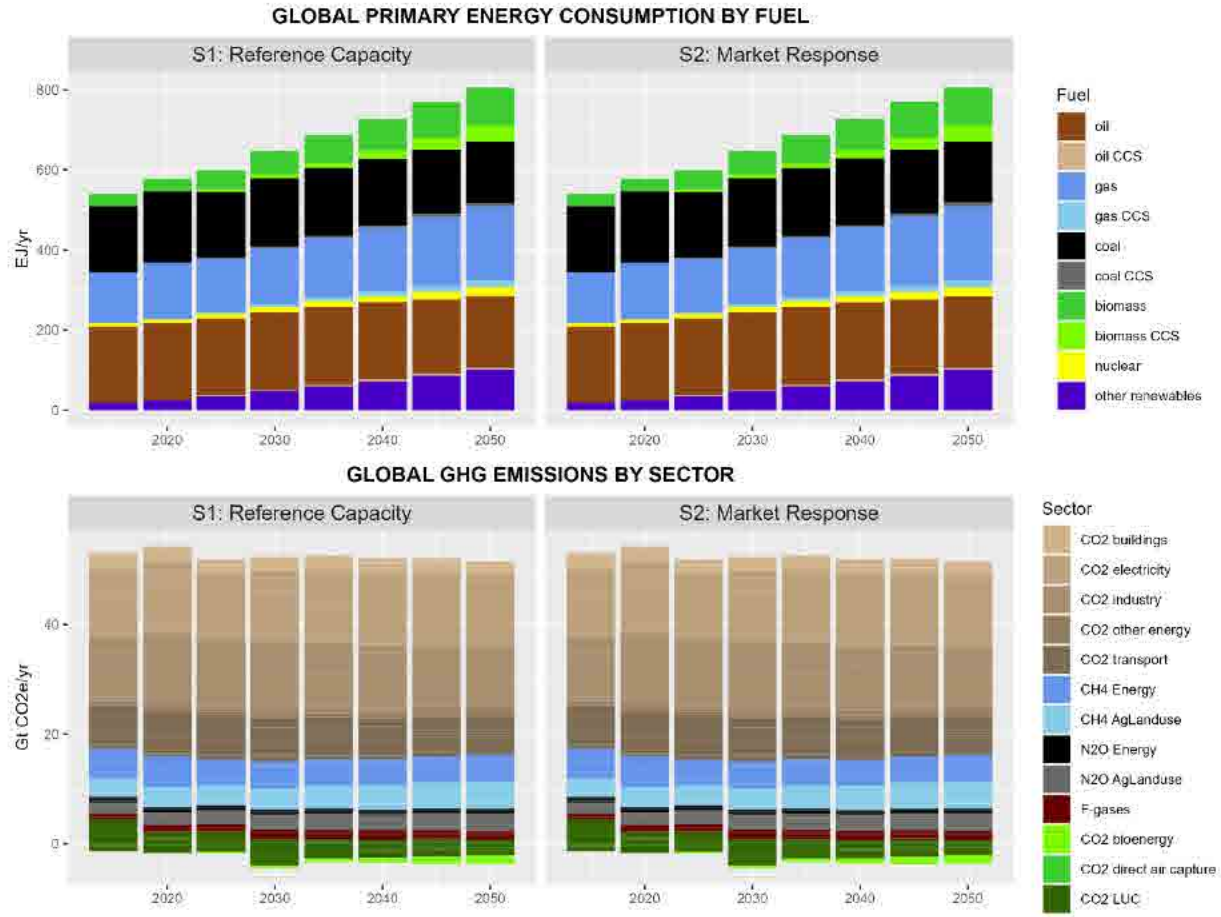
- Under *S2: Market Response*, the availability of additional U.S. gas in the global gas market at competitive prices results in:
  - A small increase (<5%) in global gas consumption by 2050
  - A reduction in production outside the U.S.
  - A reduction in LNG exports outside the U.S.
  - An increase in LNG imports outside the U.S.



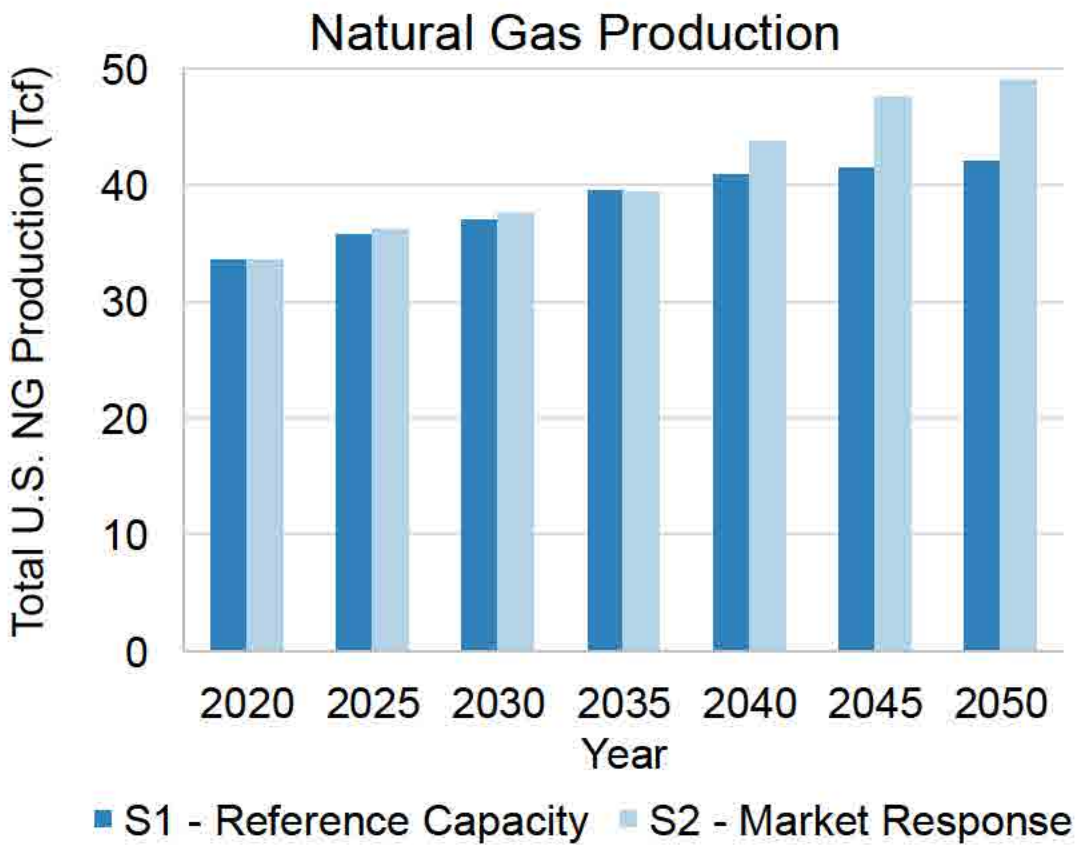

*Note: Units on top two panels are TCF and bottom two are Bcf/day*

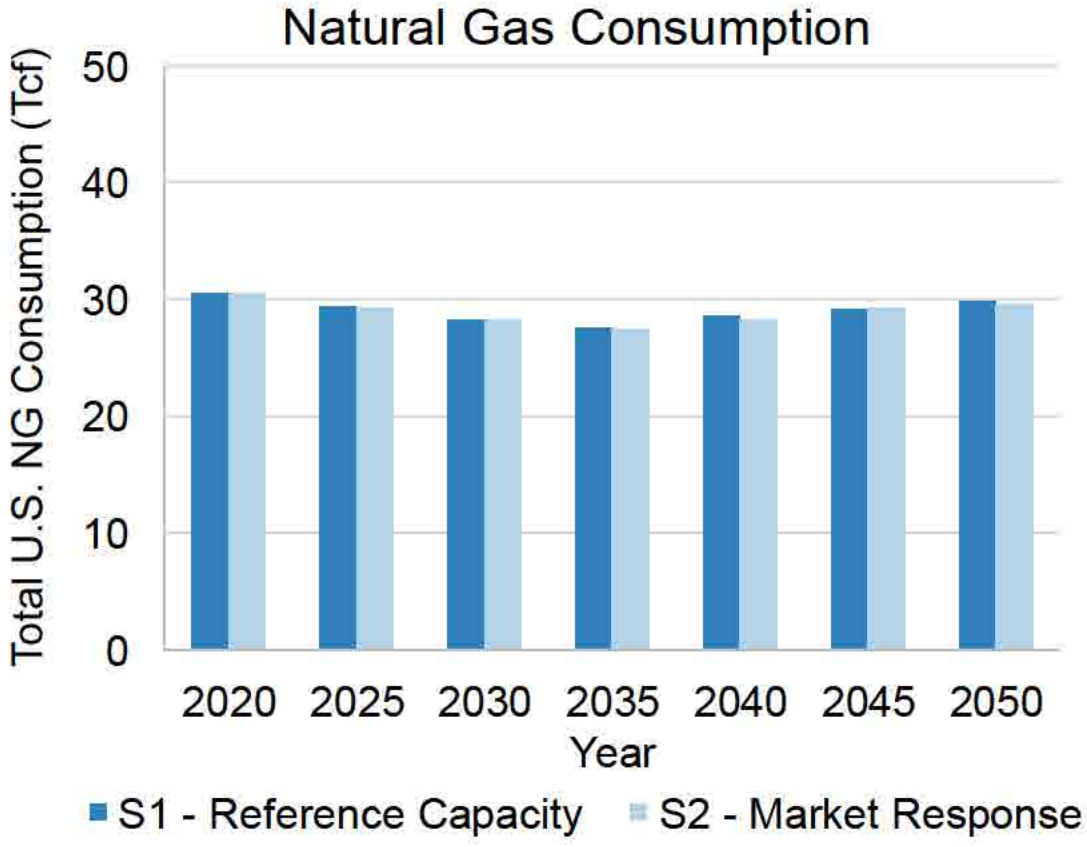
# Global primary energy and GHG emissions under S1 & S2

- Our scenarios include updated representation of global gas prices
- Under *S2: Market Response*, the availability of additional U.S. gas in the global gas market results only in a small increase (<5%) in global gas consumption by 2050
  - This is because, the principal effect of the availability of additional U.S. gas is to displace production and LNG exports from rest of the world (as discussed in the previous slide)
  - The competitiveness of natural gas relative to other fuels remains materially unaffected
- Hence, the fuel composition of primary energy consumption and greenhouse gas emissions do not change much in S2 compared to S1

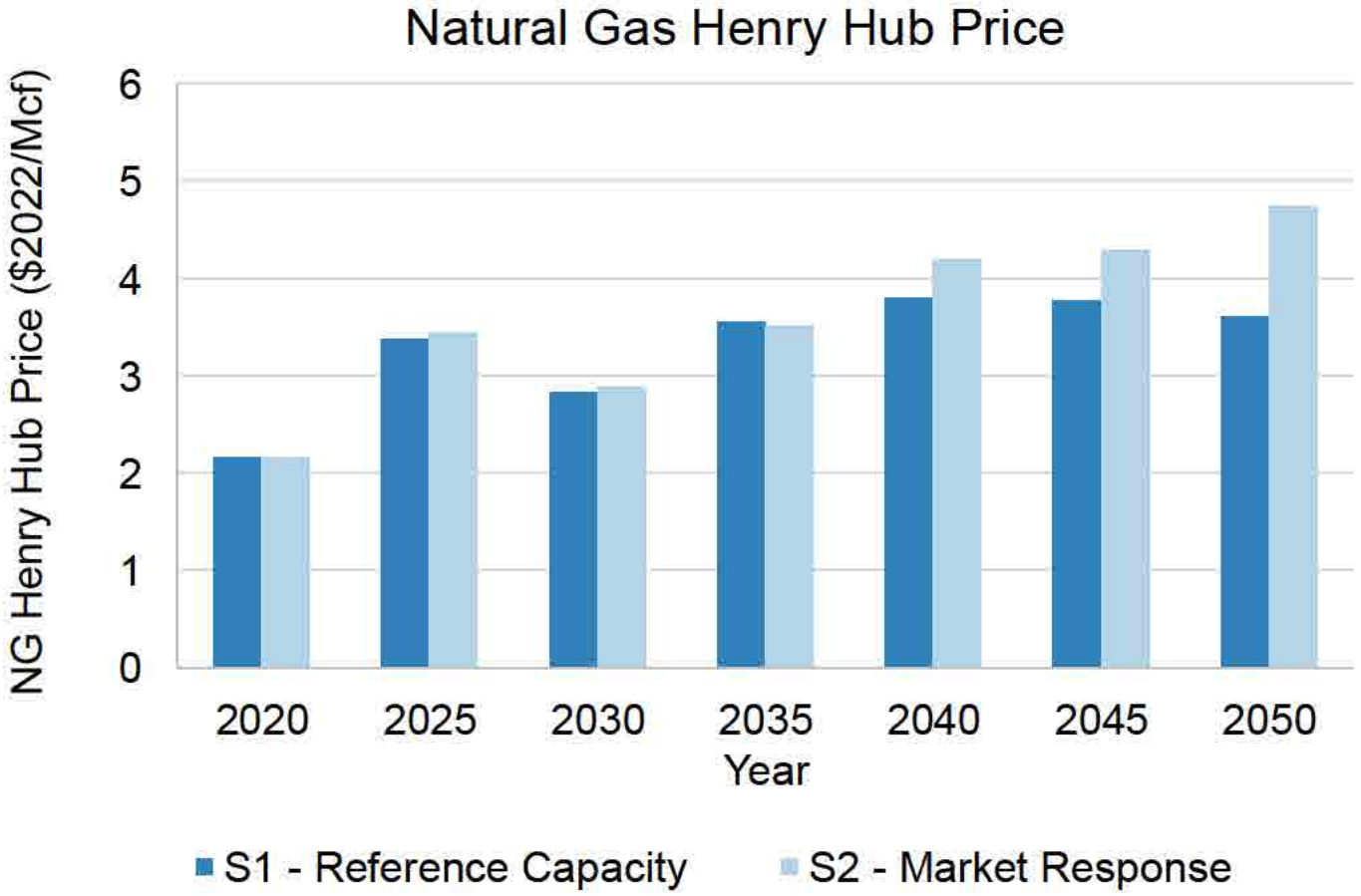


# U.S. Natural Gas Balance S1 & S2 from NEMS

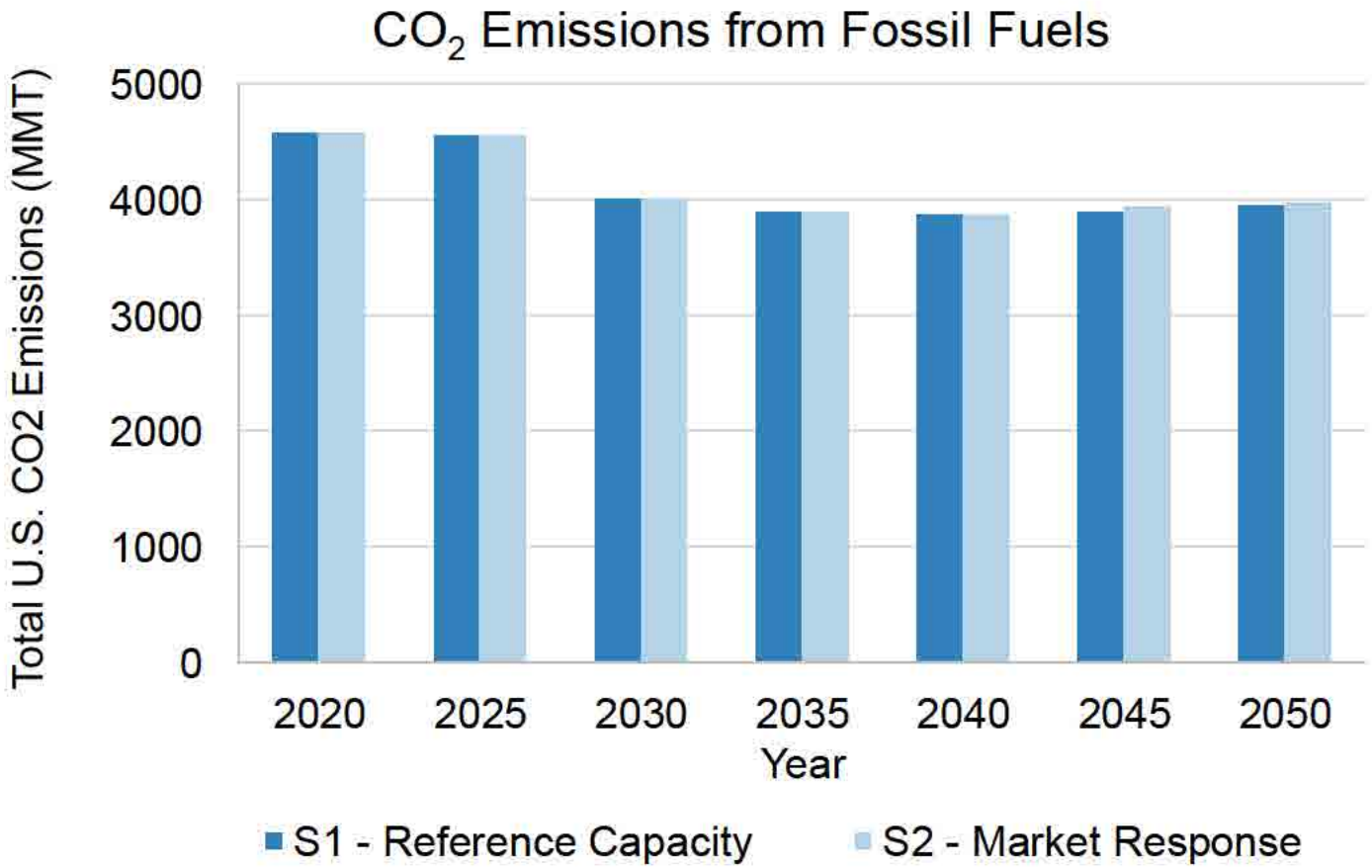


# U.S. Gas Price Impacts Under S1 & S2 from NEMS

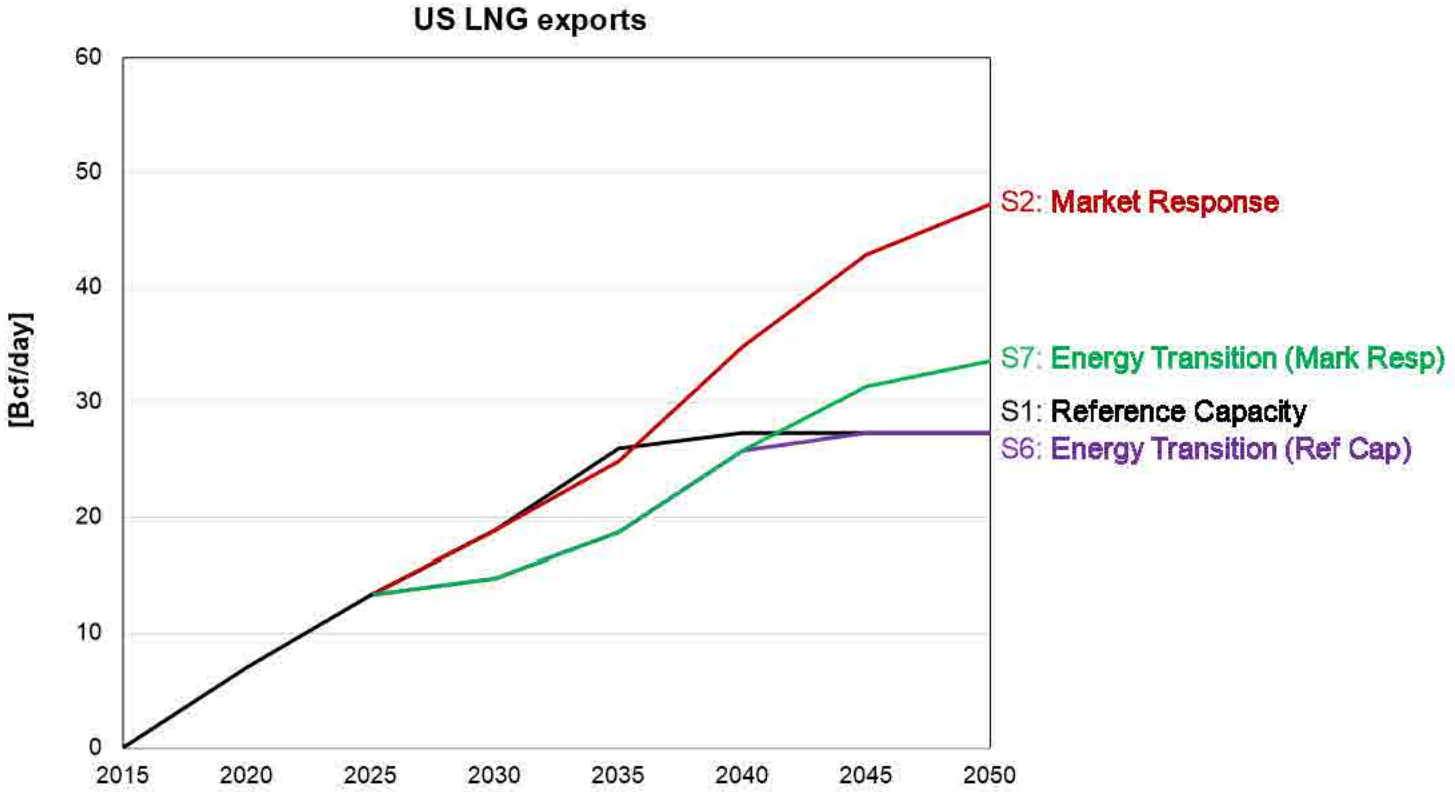


# U.S. $CO_2$ Emission S1 & S2 from NEMS



# The next few slides focus on *S6: Energy Transition (Ref Cap)* & *S7: Energy Transition (Mark Resp)*

- S6 assumes U.S. LNG exports from the AEO2023 Reference case as an upper bound and can be compared with S1 which is assumed to follow the AEO2023 Reference case trajectory
- S7 assumes economically-driven outcomes and can be compared with S2



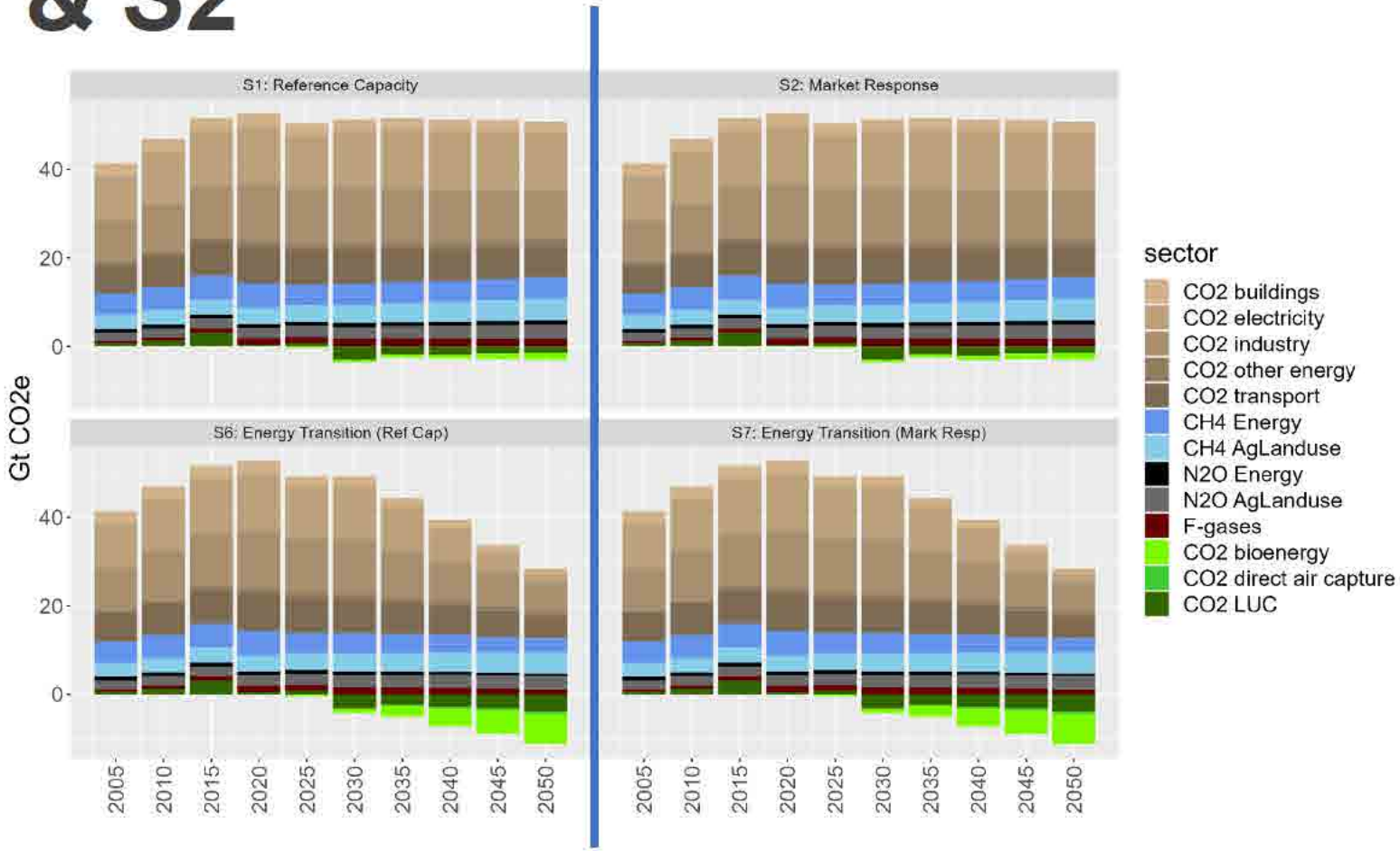

*Note: All scenarios include a constraint on Russian exports*

# Scenarios S6 & S7: Detailed assumptions

- Through 2030, countries are assumed to achieve their nationally determined contributions (NDCs)
- Beyond 2030, countries without official UNFCCC net-zero pledges or long-term strategies (LTSs) are assumed to achieve the same level of decarbonization rate as the rate between 2015 and 2030 or a minimum rate if their decarbonization rate is below this minimum rate
- Countries with official net-zero pledges (e.g. U.S.) and LTSs are assumed to follow their net-zero pledges and LTSs till the target year, followed by the path defined by the minimum decarbonization rate
- The resulting emissions pathway is consistent with a global temperature change of 1.5°C by 2100
- Countries are assumed to achieve emissions reductions within their geographic boundaries without emissions trading

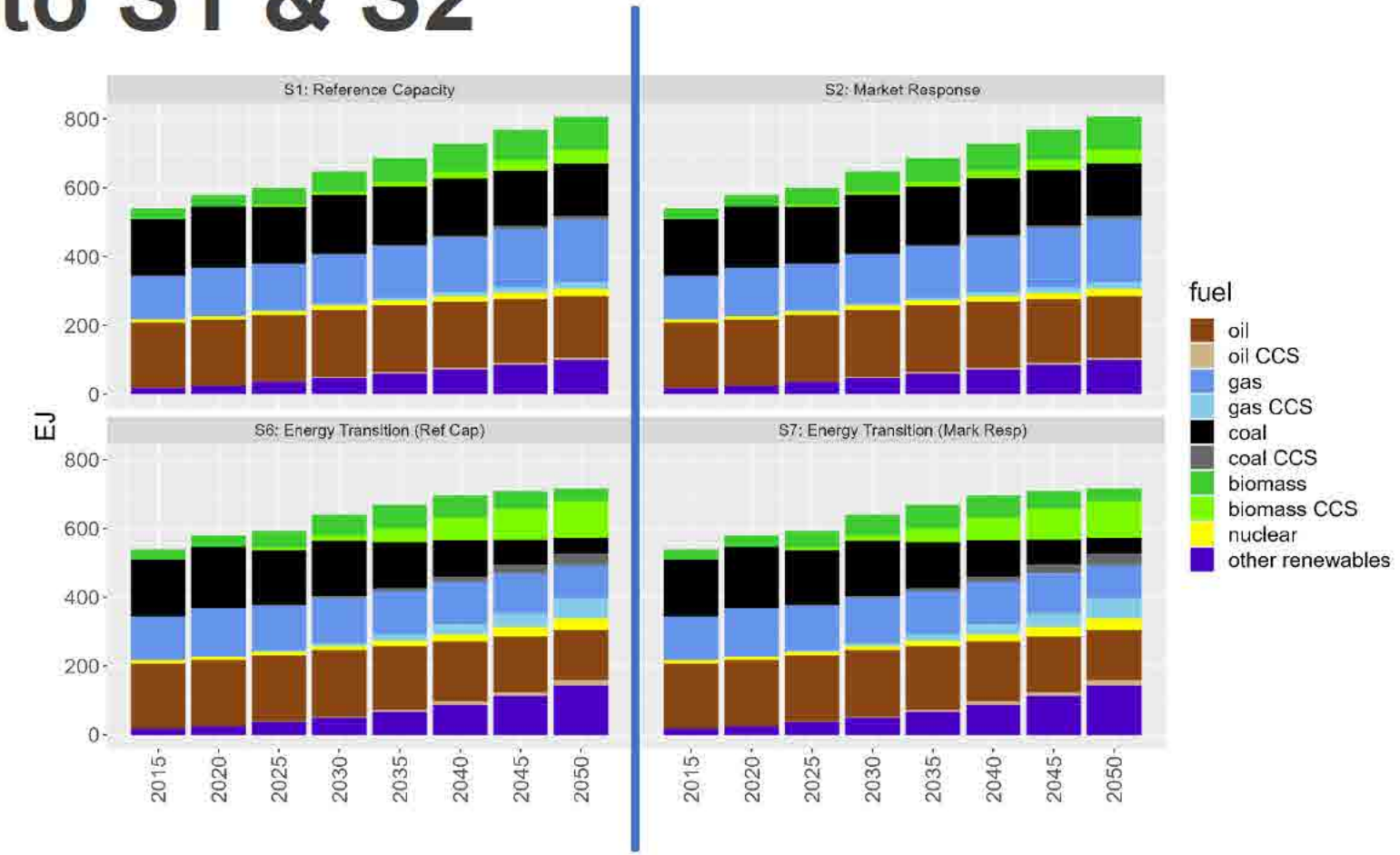
# Global GHG emissions under S6 & S7 compared to S1 & S2

- Under S6 and S7, emissions from all sectors of the economy reduce significantly compared to S1 and S2
- These scenarios are also characterized by increased deployment of carbon dioxide removal strategies
- Under S6 and S7, global GHG emissions are net-positive (~20 GtCO2e), global $CO_2$ emissions are ~0 in 2050
  - Individual countries/regions that have explicit net-zero pledges (e.g. U.S.) are assumed to achieve those pledges in the stated target years
  - Countries are assumed to achieve their pledges through a combination of decarbonization strategies (subsequent slides) within their geographical boundaries without emission trading



# Global primary energy consumption under S6 & S7 compared to S1 & S2

- Compared to S1 and S2, the transition toward 1.5°C in S6 and S7 results in:
  - A reduction in gas, coal, and oil consumption w/o CCUS;
  - Increased deployment of gas, coal, and biomass w/ CCUS;
  - Increased deployment of renewables;
  - A net reduction in energy consumption

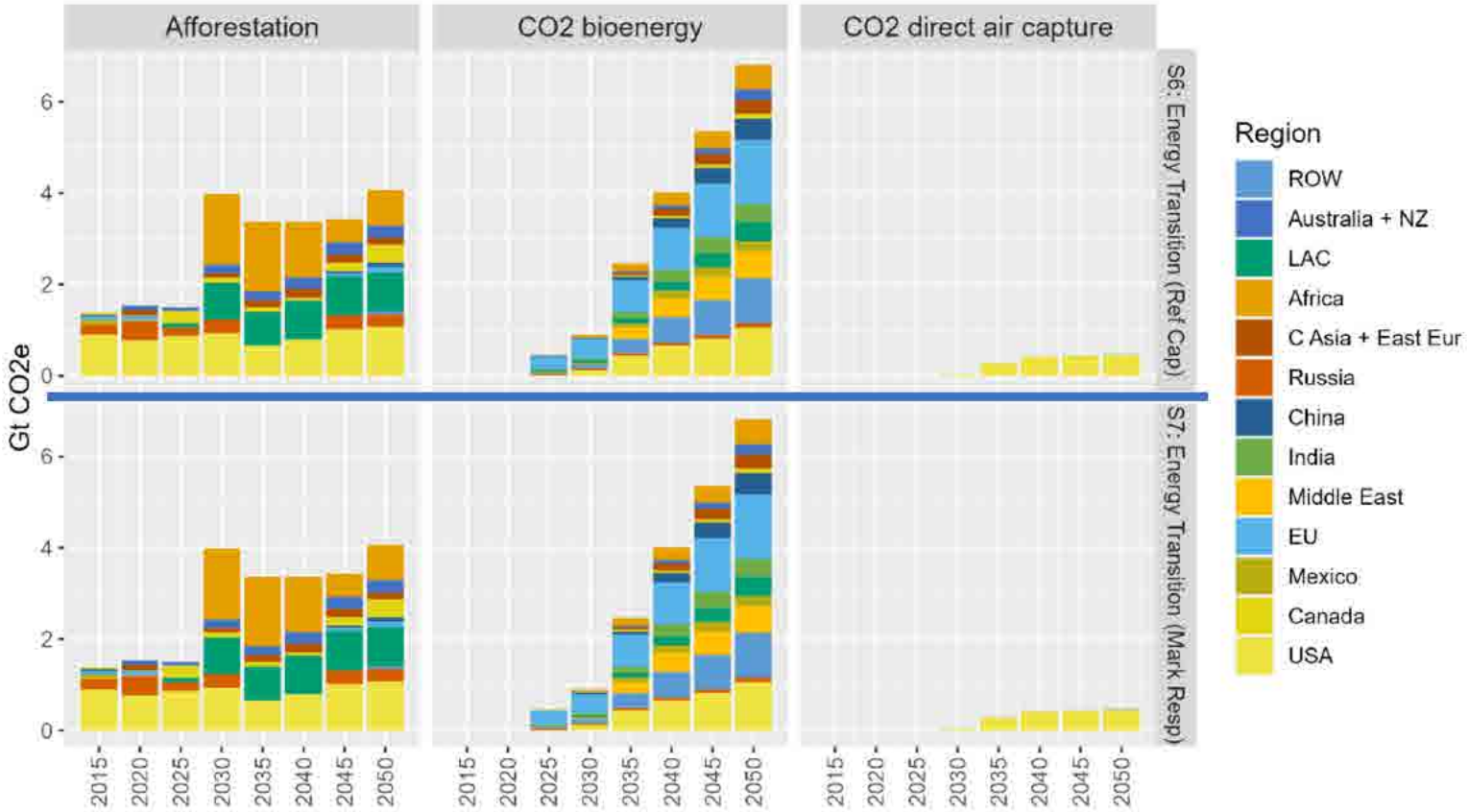


# Global $CO_2$ removal by region under S6 & S7

- Our scenarios include representation of three types of carbon dioxide removal strategies, namely, afforestation, bioenergy in combination with CCUS (BECCS), and direct air capture (DAC) under S6 and S7

- While BECCS and afforestation are distributed more evenly across regions, most of the DAC is deployed in the U.S. primarily due to the availability of carbon storage

- DAC assumptions are consistent with NEMS and developed by FECM



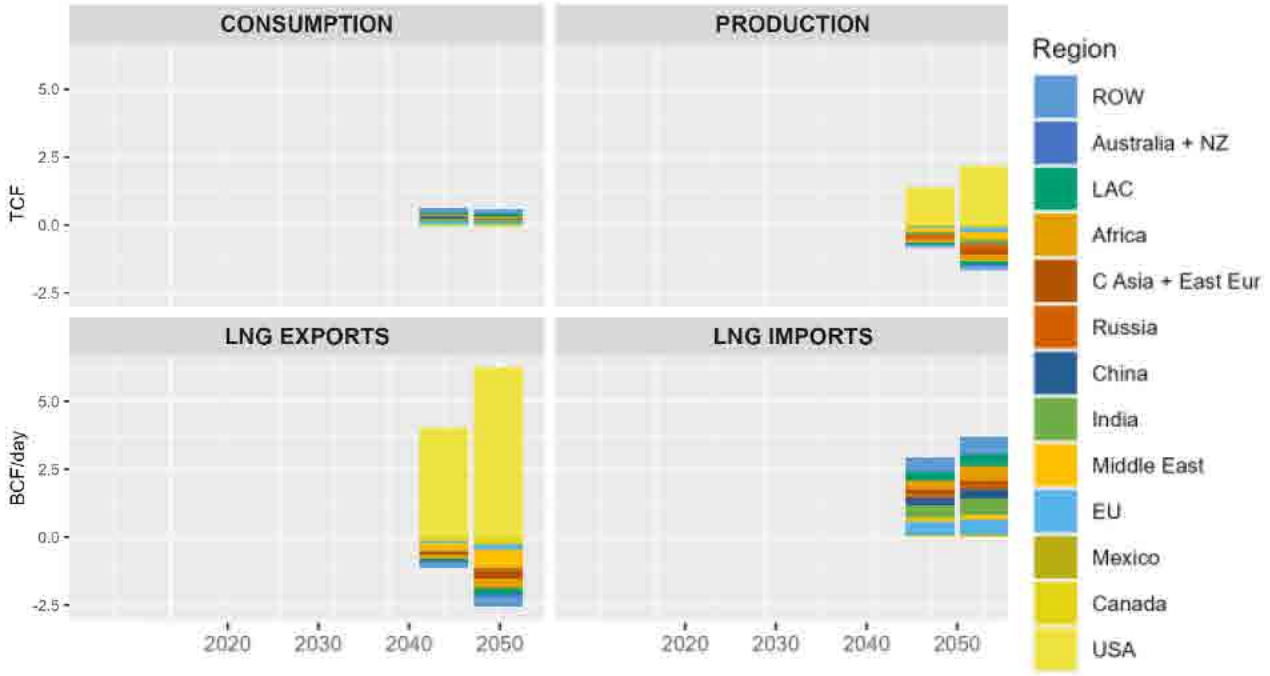
# Global natural gas consumption under S6 & S7 compared to S1 & S2

- Compared to S1 and S2, the transition toward 1.5°C in S6 and S7 results in a net reduction in gas consumption by globally
- Most of the gas under S6 and S7 is consumed in the electric power and industrial sectors for CCUS applications

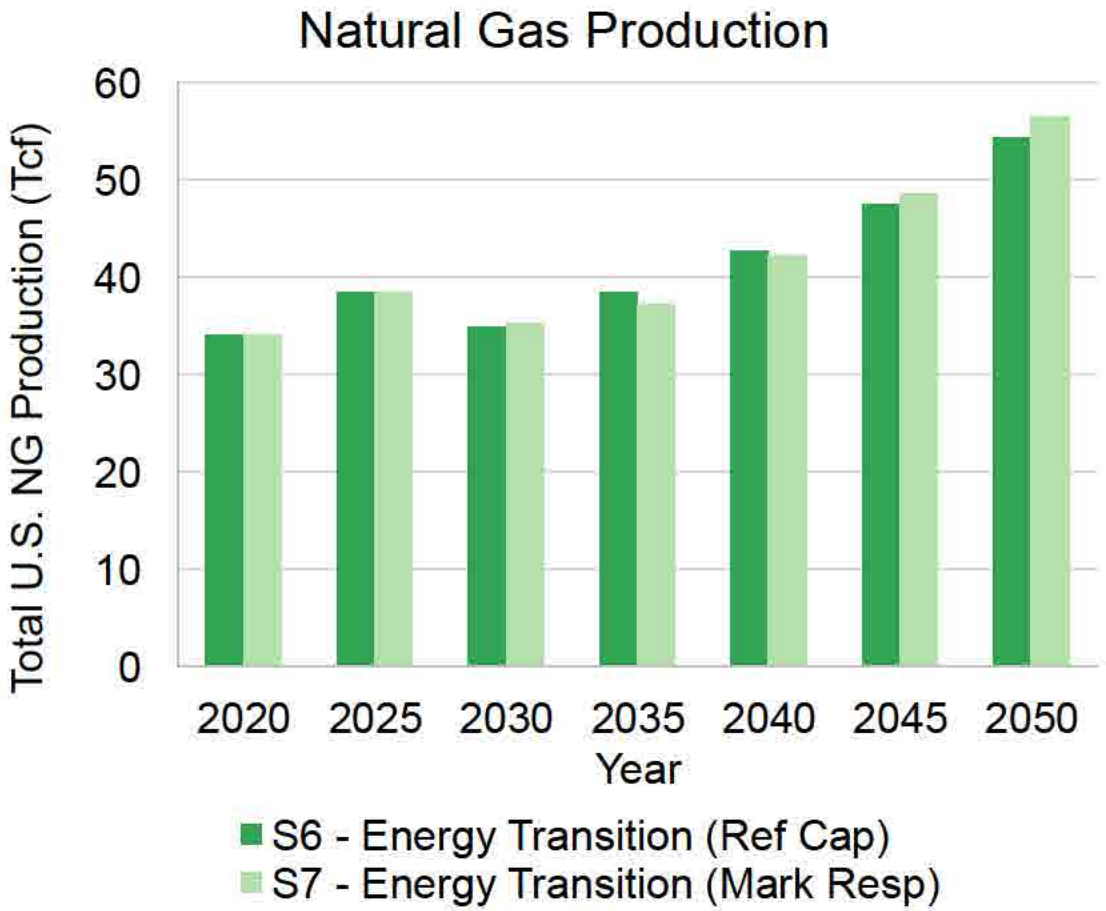


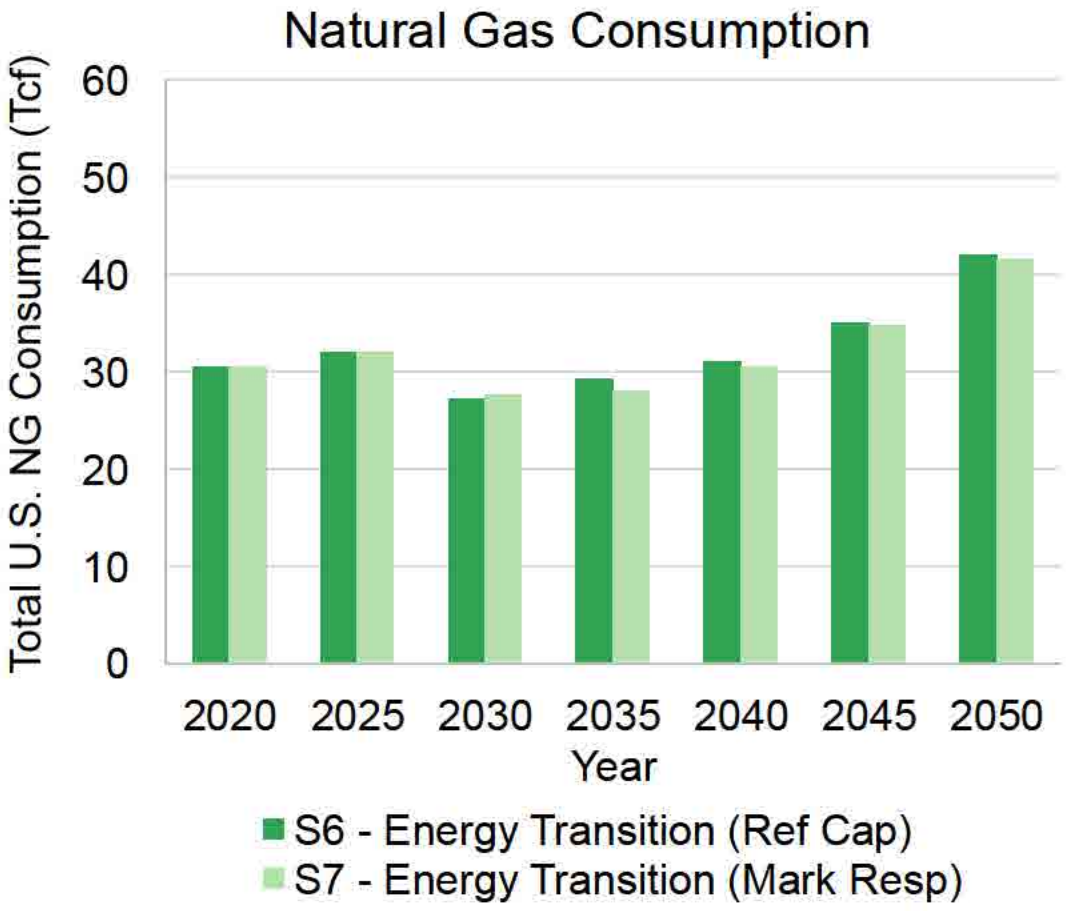
# Global natural gas consumption, production, & trade (changes) under S7 relative to S6

- Similar to the comparison between S1 and S2, the availability of additional U.S. in S7 compared to S6 results in:
  - A reduction in production outside the U.S.
  - A reduction in LNG exports outside the U.S.
  - An increase in LNG imports outside the U.S.
  - A small increase (<5%) in global gas consumption by 2050

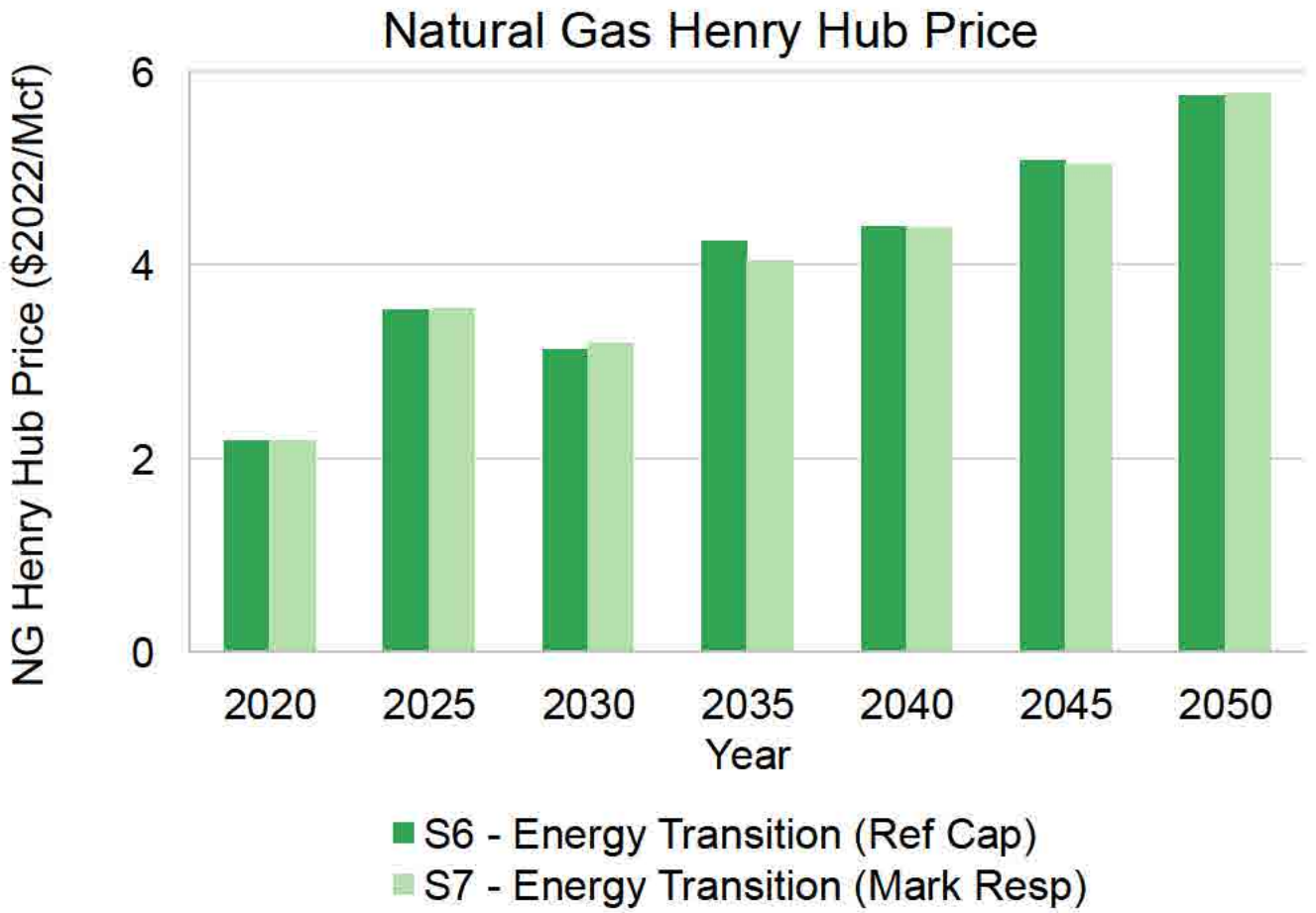


# U.S. Natural Gas Balance S6 & S7 from NEMS

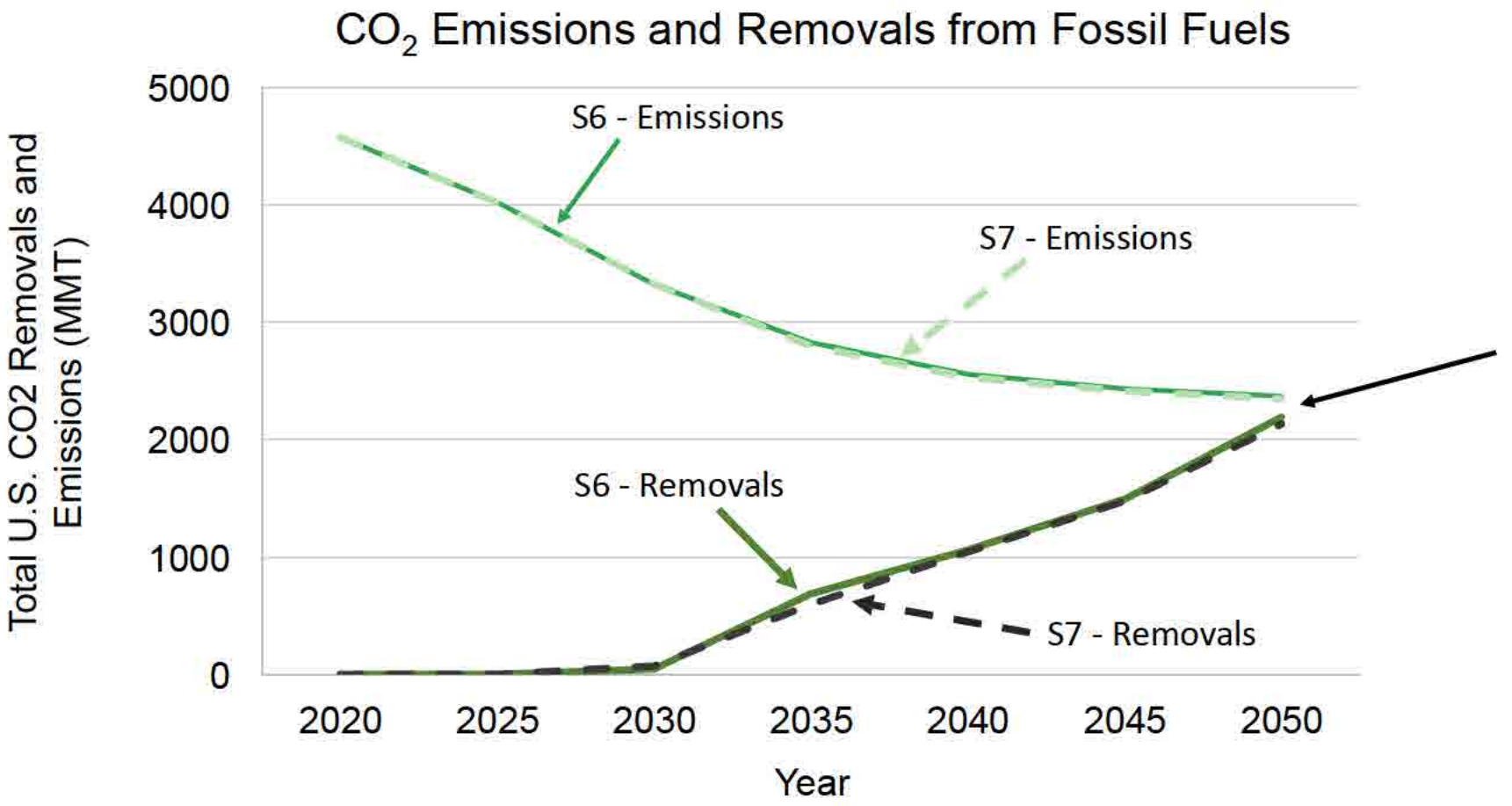


# US Gas Price Impacts Under S6 & S7 from NEMS



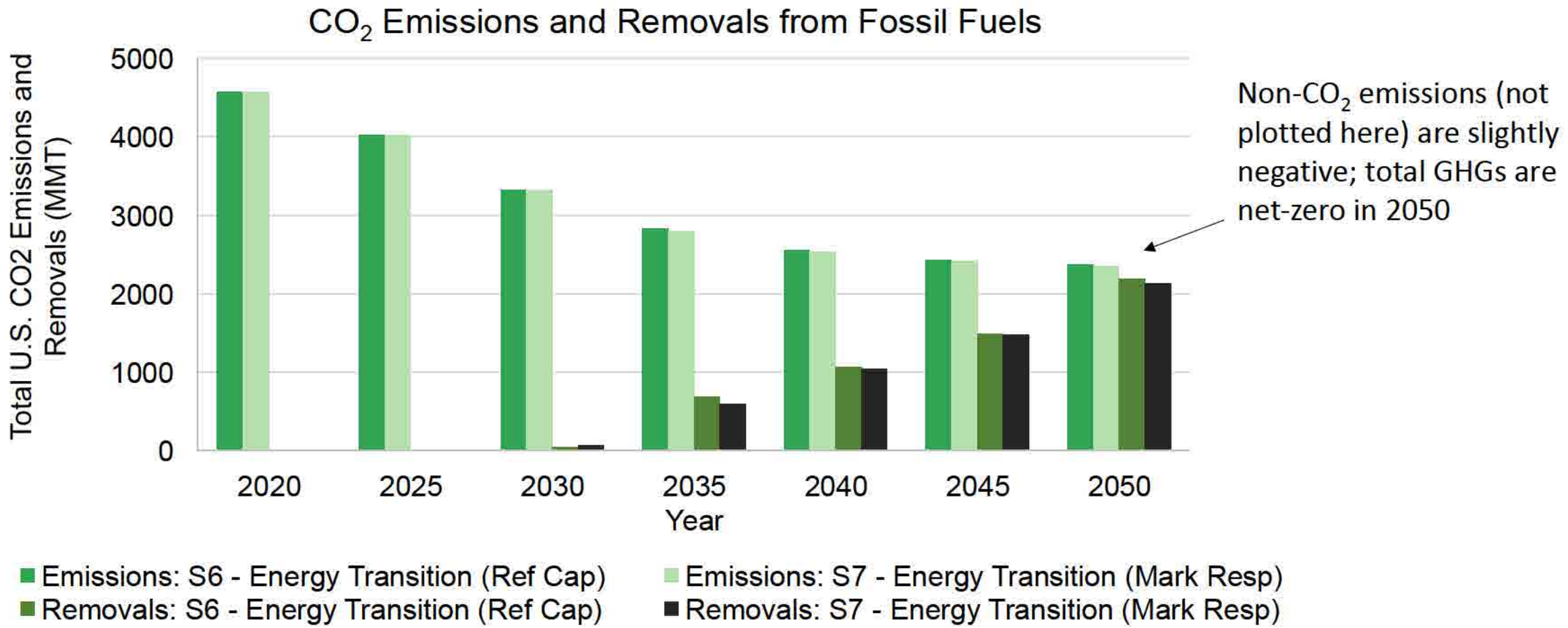
# U.S. $CO_2$ Emission and Mitigation S6 & S7 from NEMS (this over next slide?)



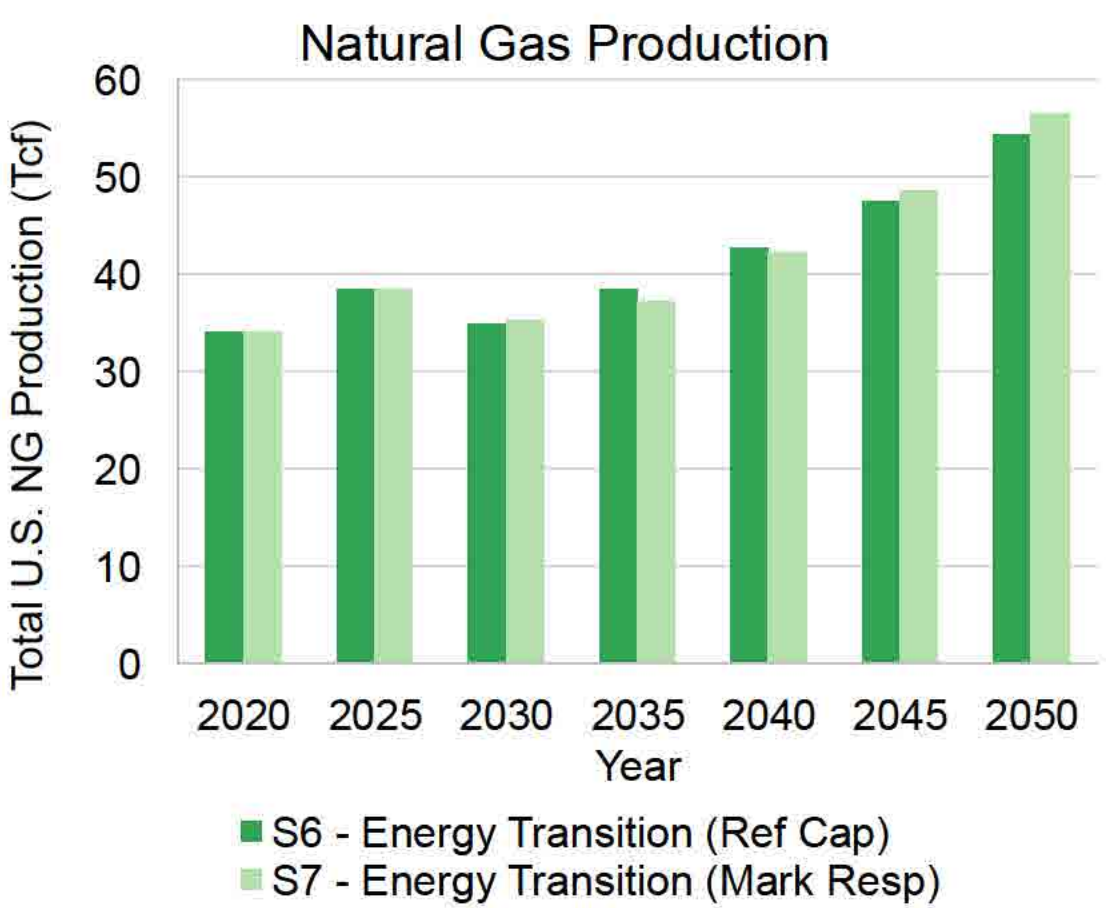

Non-$CO_2$ emissions (not plotted here) are slightly negative; total GHGs are net-zero in 2050

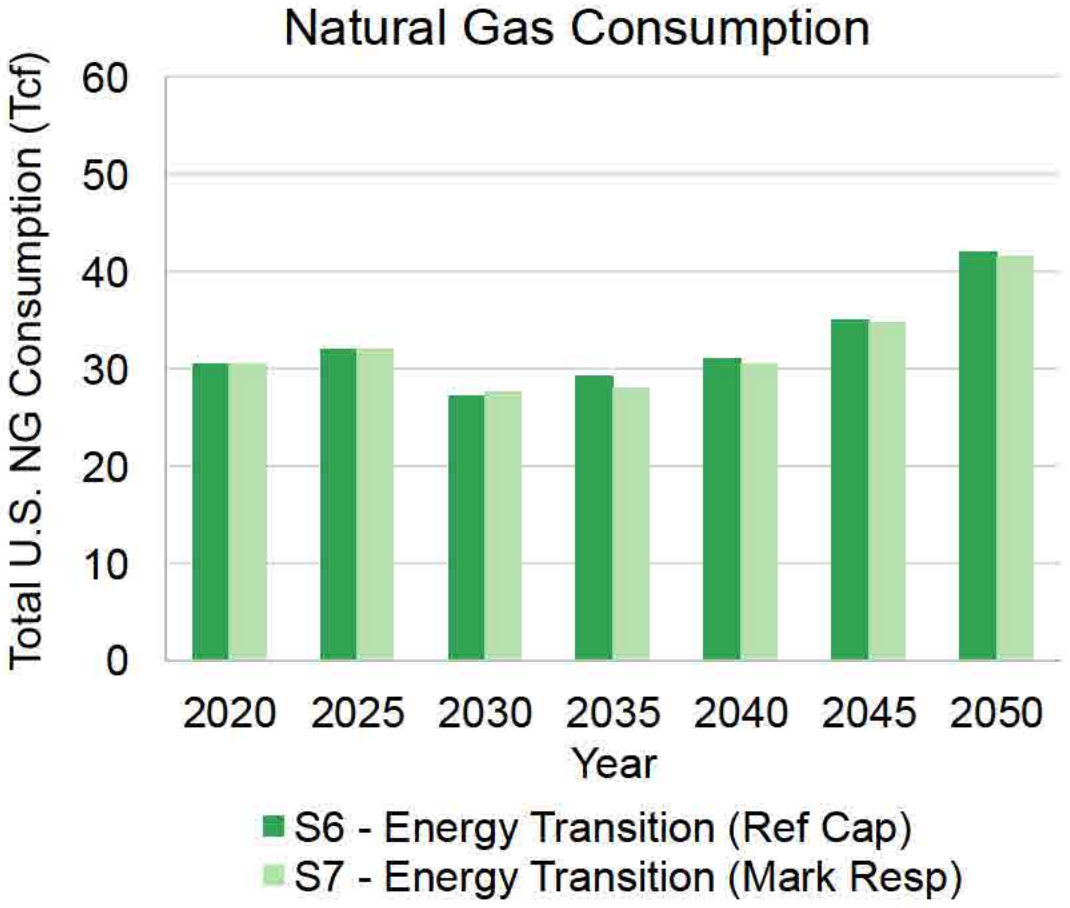
S6 - Energy Transition (Ref Cap)
S7 - Energy Transition (Mark Resp)

# U.S. $CO_2$ Emission Mitigation S6 & S7 from NEMS



# U.S. Gas Consumption by sector under S6 and S7



# Key Takeaways

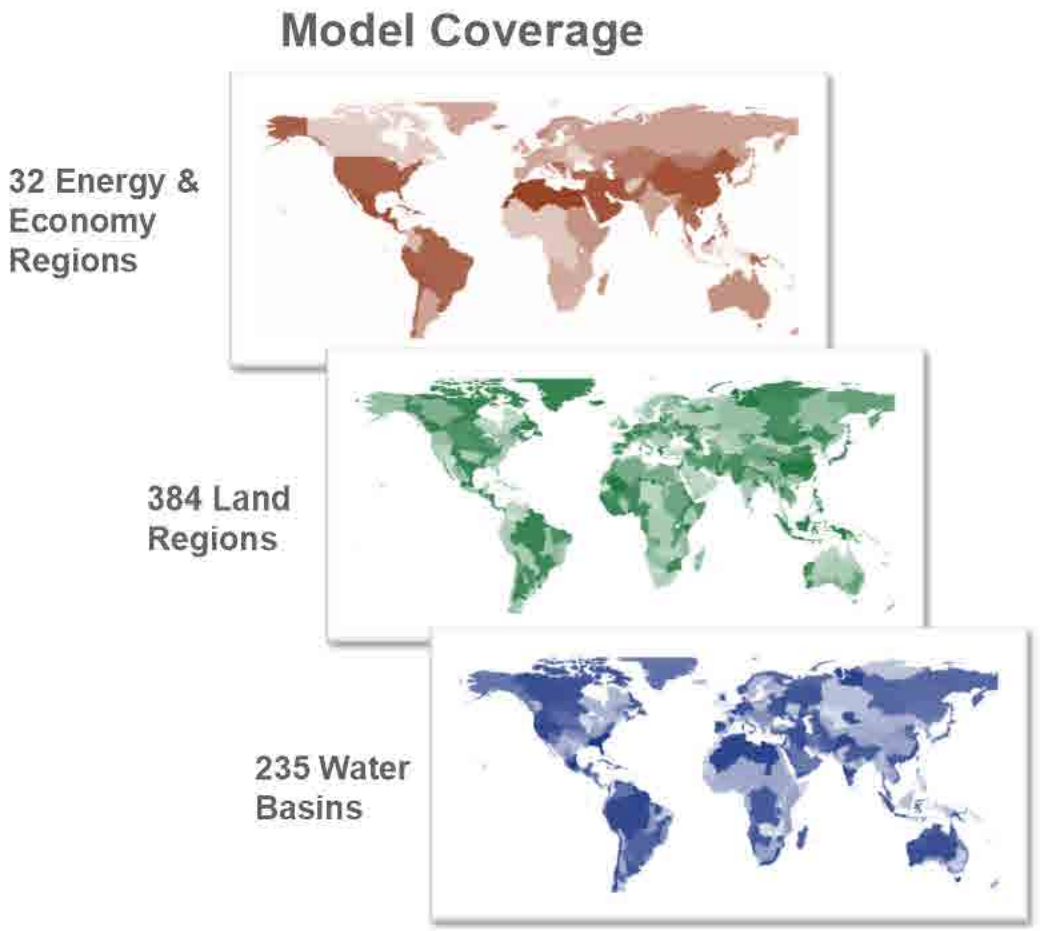
- U.S. LNG exports continue to grow beyond existing and planned capacity in all modeled scenarios through 2050.
- U.S. $CO_2$ emissions do not change significantly across scenarios (except the scenario that assumes a global 1.5°C consistent pathway, S6).
- When compared to a scenario in which U.S. LNG exports are constrained (S1), an unconstrained scenario that assumes economically driven LNG export levels (S2) leads to:
  - Significant growth in U.S. LNG exports
  - Little change in global GHG emissions and global gas consumption
  - Moderate increases in U.S. natural gas prices (2050 prices projected to increase from $3.74/MMBtu to $4.95/MMBtu. Previous study, at lower export levels, projected 2050 prices above $6.00/MMBtu.)
- Under a global energy transition consistent with meeting a 1.5°C target (S6), U.S. LNG exports continue to grow through 2050 – albeit at a slower rate compared to the unconstrained scenario – driven by increased demand for gas in combination with CCUS in the power and industrial sectors and to support direct air capture operations for atmospheric $CO_2$ removal.

# Next Steps

- Finalize GCAM and NEMS analyses based on Leadership Briefing and complete report
- Conduct Final Review NETL LCA Analysis and Environmental Review
- Complete ALL Reviews and Briefings to Publish summary report and supporting documentation for public comment by End of September Target date

# Appendix:
# GCAM Extra Material

# The Global Change Analysis Model (GCAM)




- GCAM links **Economic**, **Energy**, **Land-use**, **Water**, and **Climate** systems in a technology-rich model
- Runs from 2015 (calibration year) to 2100 in 5-year time-steps
- Emissions of 16 greenhouse gases (GHG) and air pollutants are tracked
- GCAM is a community model: http://jgcri.github.io/gcam-doc/toc.html
- GCAM includes representation of LNG and pipeline gas trade
- Our representation creates price-based competition between domestic gas and imported LNG/pipeline gas
  - Introduces realistic inertia in the evolution of trade from current patterns
- Traded LNG is represented as a single global market
- Traded pipeline gas is represented in six regional markets

# Examples of GCAM's technological detail

## Electricity generation

- Coal w/ and w/o CCUS
- Gas w/ and w/o CCUS
- Oil w/ and w/o CCUS
- Bio w/ and w/o CCUS
- Nuclear
- PV w/ and w/o storage
- CSP w/ and w/o storage
- Onshore and Offshore wind
- Geothermal

## Buildings

- Residential cooling
- Residential Heating
- Residential other
- Commercial Cooling
- Commercial Heating
- Commercial Other

** Each of the above services includes representation of fuel competition. For e.g., residential heating service includes competition between electricity, gas, H2, biomass, and liquids.*

## Transport

- Passenger
- Freight
- International freight shipping
- Long-distance passenger air travel

** Each of the above sectors includes representation of fuel competition. For e.g., the passenger sector includes different modes (e.g., road, rail), sub-modes (e.g., bus, light duty vehicle), size classes, and drivetrain technologies (e.g. electric, hybrid, combustion engine).*

## Industry

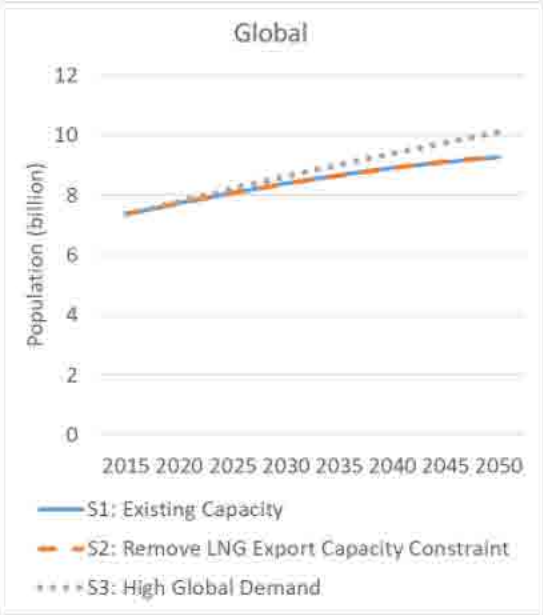
- Cement
- Fertilizers
- Iron & Steel
- Pulp & Paper
- Chemicals
- Aluminum
- Construction
- Mining
- Agriculture
- Other

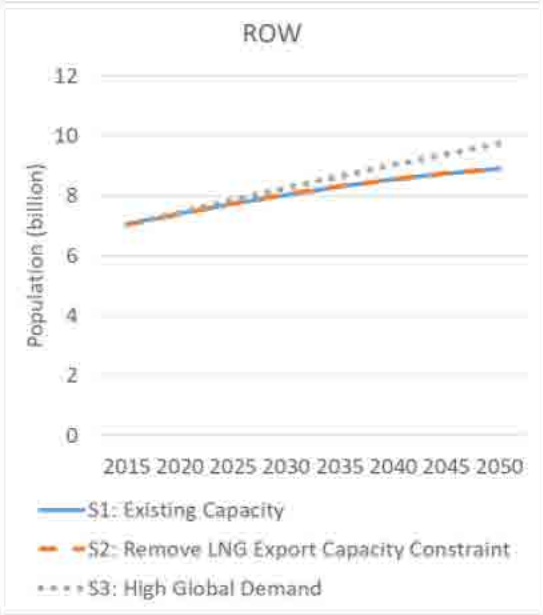
** Each of the above industries include more representation of processes and fuel competition. For e.g., the Iron & steel sector consists of three processes: Basic Oxygen Furnace, Electric Arc Furnace with scrap, and EAF with Direct Reduced Iron. Each process includes competing technologies, such as fossil fuels w/ & w/o CCS, electricity, hydrogen, and biomass.*

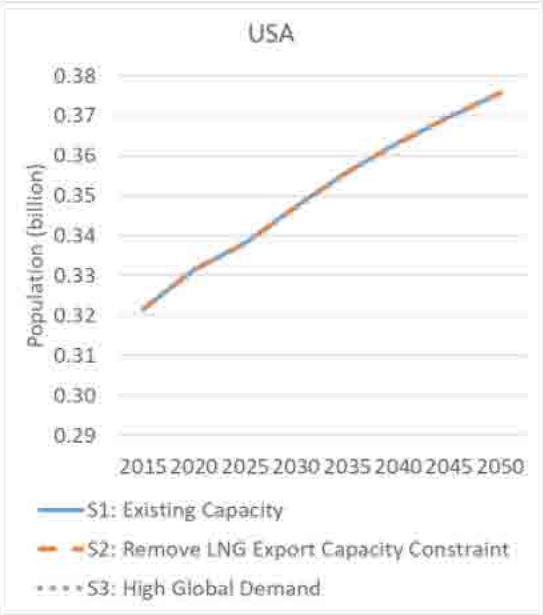
# Common assumptions across all scenarios

- IRA in the US, and current emission policies in the rest of the world
- Constraint on Russian exports
  - Flat to declining Russian exports to EU
  - Flat LNG exports from Russia
  - Increasing Russian pipeline exports to the east
- Planned and existing LNG capacity additions in Middle East, Australia, Canada, Southeast Asia, and Africa
- U.S. population and economic growth harmonized to AEO-2023 Reference case

# Scenario 3 (High Global Demand): Detailed assumptions



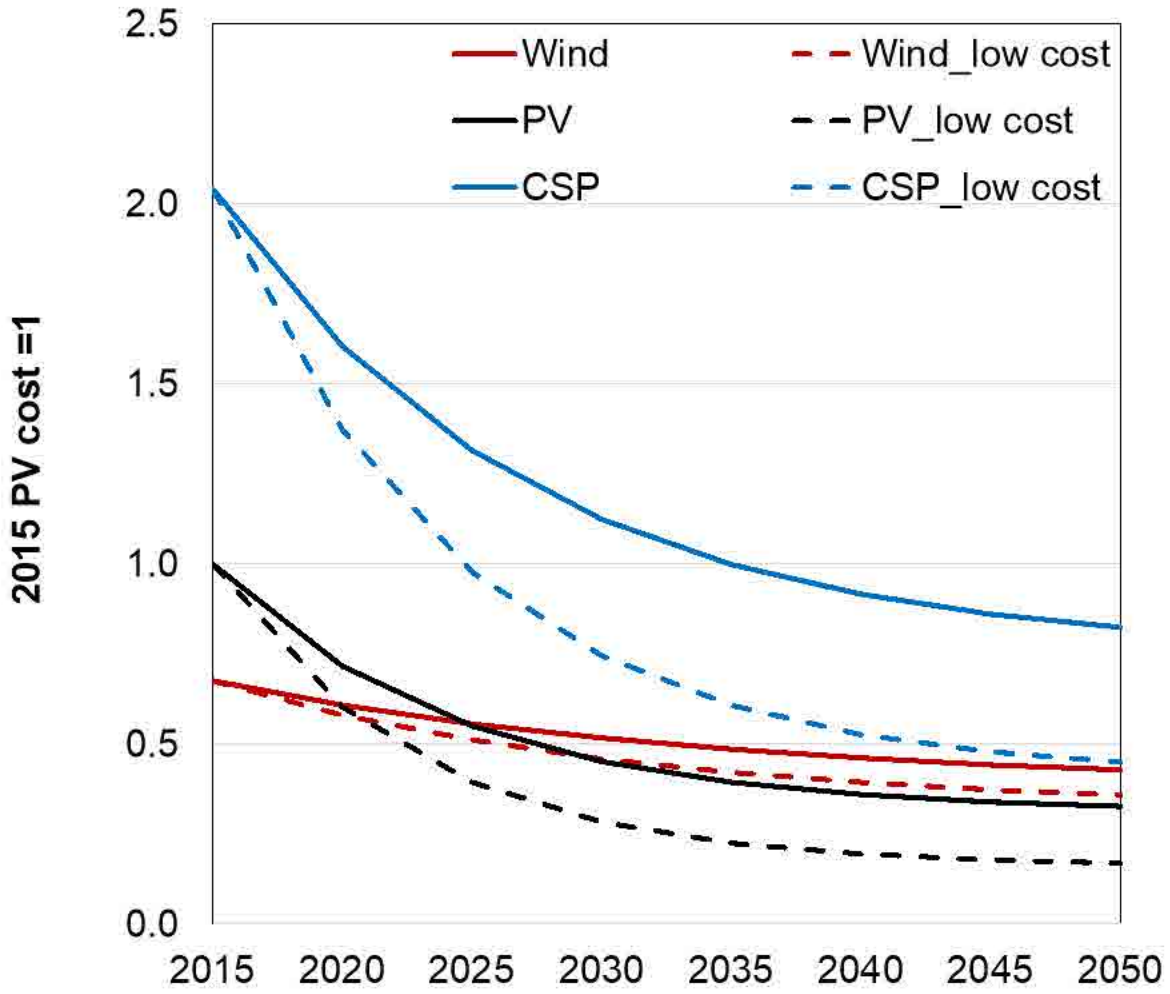

- To construct the High Global Demand Scenario, we assume the non-US regions to have higher population growth consistent with the Shared Socioeconomic Pathways – 3
- This results in ~1 billion more people globally in S3 by 2050 compared to S1/S2
- US population is assumed to remain unchanged relative to S1/S2
- US Population assumptions in Scenarios S1 and S2 are harmonized with AEO-2022

# Scenario 4 (Regional Import Limits): Detailed assumptions

| Region Type | GCAM Regions | High-level target / sanction |
|---|---|---|
| **Developed countries, natural gas importers with sufficient resources** | EU-12, EU-15, Europe_Eastern, Europe_Non_EU | Reduce gross imports to 90% by 2030 and zero by 2035 |
| **Developed countries, natural gas importers, low natural gas resources** | Japan, South Korea, Taiwan | Maintain current import dependence through 2050 |
| **Developing countries, natural gas importers** | Brazil, China, India, Pakistan, Southeast Asia, Mexico, South Africa | Maintain current import dependence through 2050 |
| **Natural gas exporters** | USA, Africa_Eastern, Africa_Northern, Africa_Southern, Africa_Western, Australia_NZ, Canada, Central America and Caribbean, Central Asia, European Free Trade Association, Indonesia, Middle East, South America_Southern, South America_Northern, South Asia, Colombia, Argentina | Zero out any imports by 2035 |
| **Russia** | Russia | • Flat to declining Russian exports to EU<br>• Flat LNG exports from Russia<br>• Increasing Russian pipeline exports to the east |

# Scenario 5 (Low Cost Renewables): Detailed assumptions

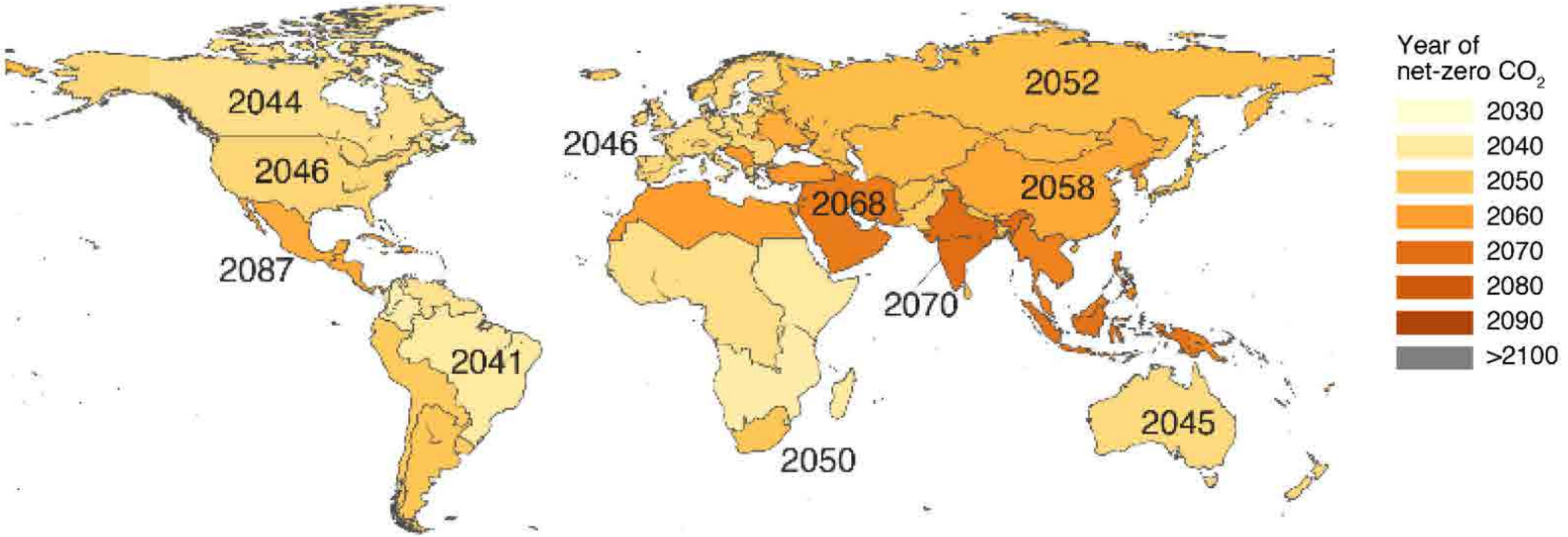
- To construct this scenario, we use capital cost assumptions for renewable technologies from the NREL's Annual Technology Baseline (ATB) "Low" assumptions



# Scenario 6 (Energy Transition): Detailed assumptions

- To construct the Energy Transition scenario, we begin with countries' most recent commitments and pledges
- Countries are assumed to achieve their nationally determined contributions through 2030
- Countries with net-zero pledges (including the US), and long-term strategies are assumed to achieve those pledges
- For countries without net-zero or long-term pledges, the scenario assumes a minimum threshold for the post-2030 decarbonization rate such that globally emissions follow a path consistent with limiting global warming to less than 1.5°C
- These assumptions are consistent with published literature: Fawcett et al., 2015, *Science*; Ou & Iyer et al. 2021, *Science*; Iyer & Ou et al. 2022, *Nature Climate Change*

# Year of net-zero CO2 emissions in S6




Source: Iyer & Ou et al. 2022, Ratcheting of climate pledges needed to limit peak global warming, *Nature Climate Change*

# IRA assumptions in GCAM

- Power:
  - PTC extension (13101)
  - ITC extension (13102)
  - Production tax credit for existing nuclear (13015): We assume that the nuclear PTC prevents retirements of existing nuclear power plants through 2032
- 45Q: Extension of credits for captured CO2 (13104)
  - We take a middle of the road approach assuming that 50% of projects pay prevailing wages and 50% don't
  - To be conservative, the first model period the credit is available is 2030. Introducing the credit in 2025 may induce more CCS / DAC in GCAM than can be realistically built in the next 2 years
- 45V: Production credits for clean hydrogen (13204)
  - We assumed hydrogen with CCS receives a greater subsidy from 45Q than 45V (Clean Hydrogen Subsidy) and claims 45Q in lieu of 45V.
  - For grid electrolysis, we take 2020 (national average) grid CO2 intensity and assume a linear future emissions reduction to 90% below 2020 levels in 2035.

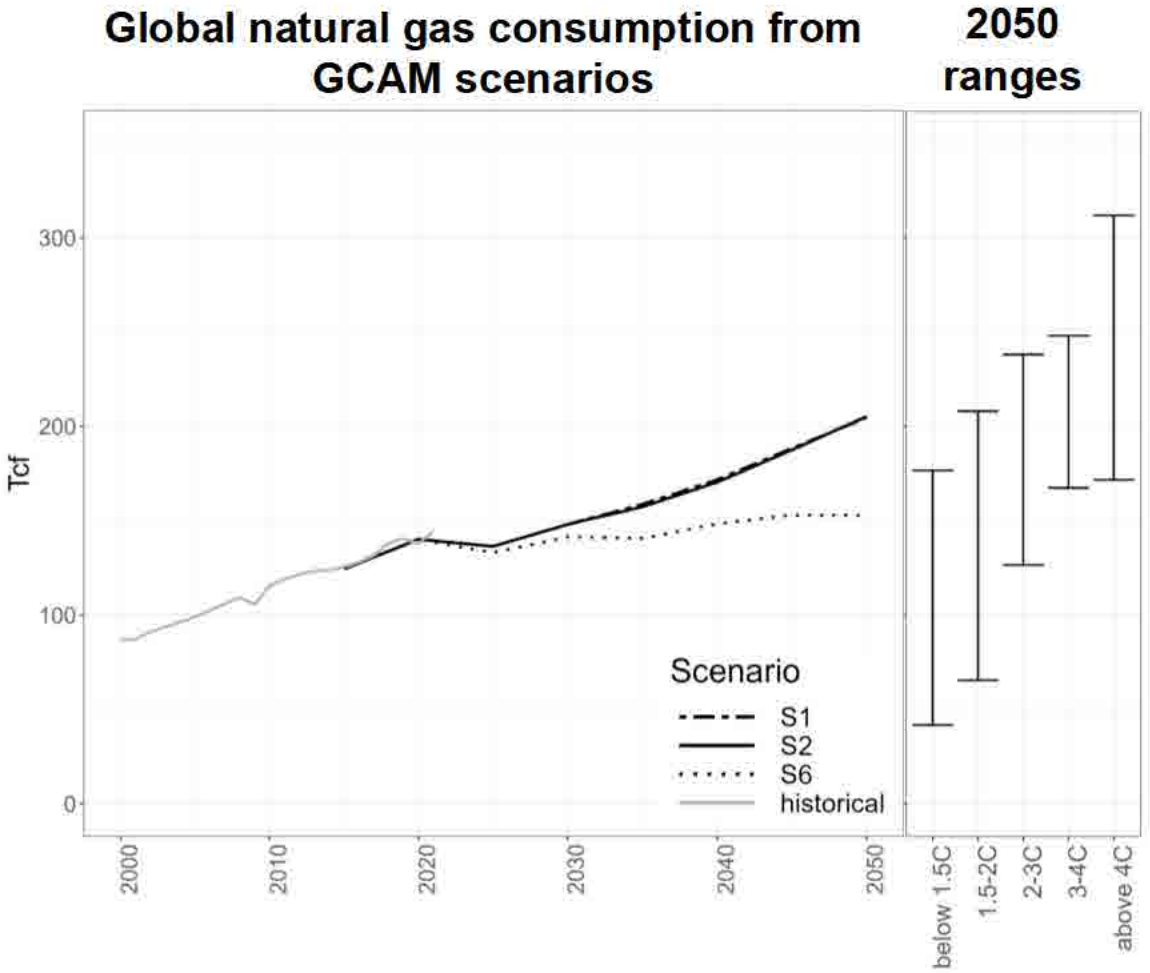
# IRA assumptions in GCAM

- Transport:
  - Clean vehicle credit (13401):
  - We assume that the US auto manufacturing market will adjust their battery production to meet the domestic material requirements, allowing all new EVs produced in 2030 to qualify for the tax-credit.
  - We estimate that 89% of American taxpayers qualify for this tax-credit based on income eligibility requirements.
  - Commercial clean vehicle credit (13403)
  - Alternative refueling property credit (13404): Based on census data, 17.4% of Americans live counties that are either rural or low-income, so the $1,000 property credit is modeled as a weighted average national subsidy of $174 for capital infrastructure cost for LDV EVs.
  - Extension of incentives for biofuels (13201/13202)
  - Sustainable aviation credit (13203): subsidy for FT biofuels technologies (assumption is that jet fuel is first market for FT biofuels)
- Buildings:
  - Residential clean energy credit (13302): credit for rooftop PV
  - Energy Efficient Home Credit (13304): shell efficiency improvement
- Agriculture methane (21001): We assumed the 8.5 billion for EQIP contributed to ag CH4 reductions

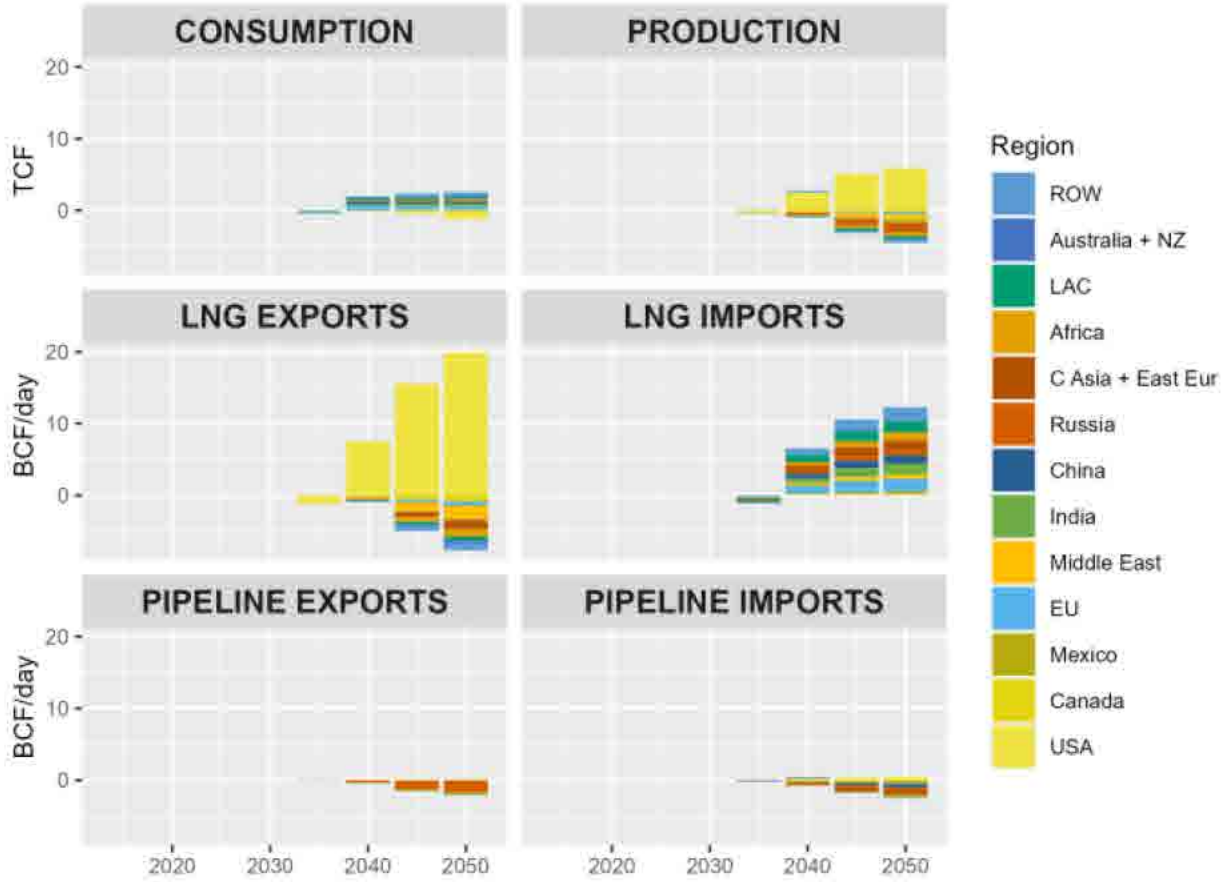
# Comparison with scenarios in the literature

- The panel on the right shows 10-90th percentile ranges for global natural gas consumption in 2050 across scenarios in the sixth assessment report of the IPCC

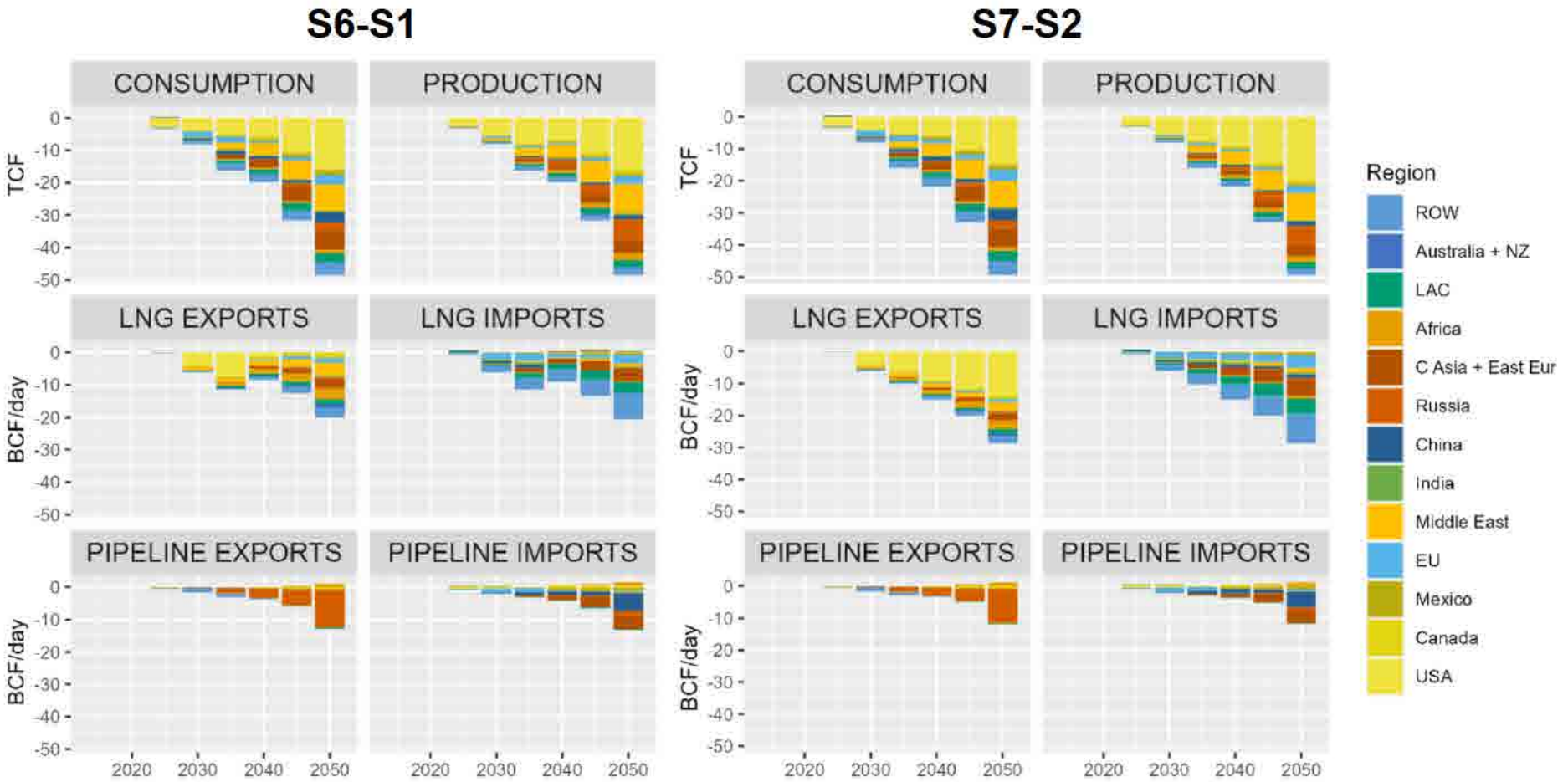
- Our *Energy Transition* scenario lies within the range of scenarios assessed by the IPCC
  - It is on the higher end which is consistent with scenarios w/ CCUS



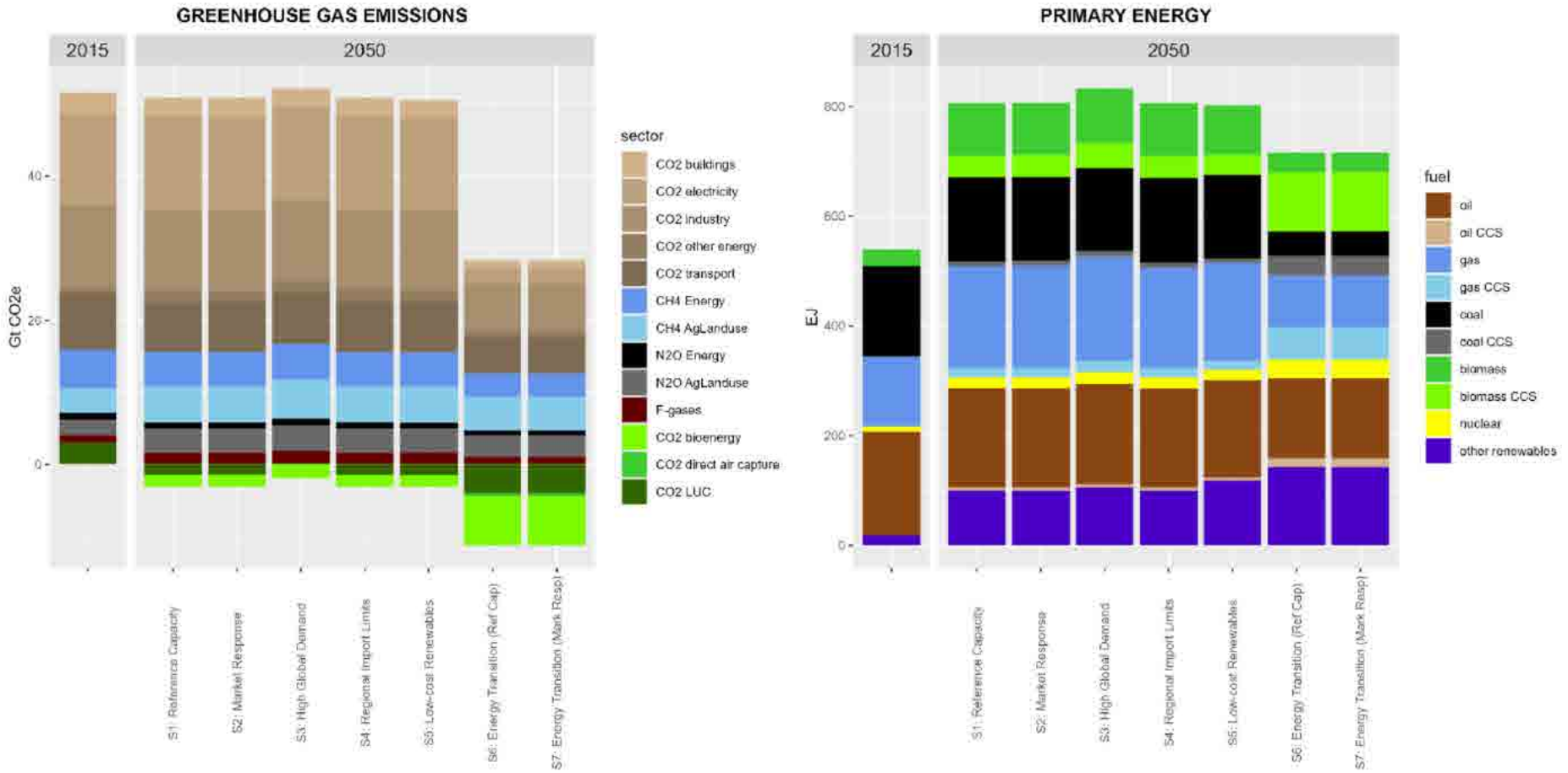
# Changes in S2 v. S1 along with pipeline trade



# Changes in S6 v. S1 and S7 v. S2



# Global GHG emissions and primary energy in 2050 under all scenarios



# Appendix:
# NEMS Extra Material

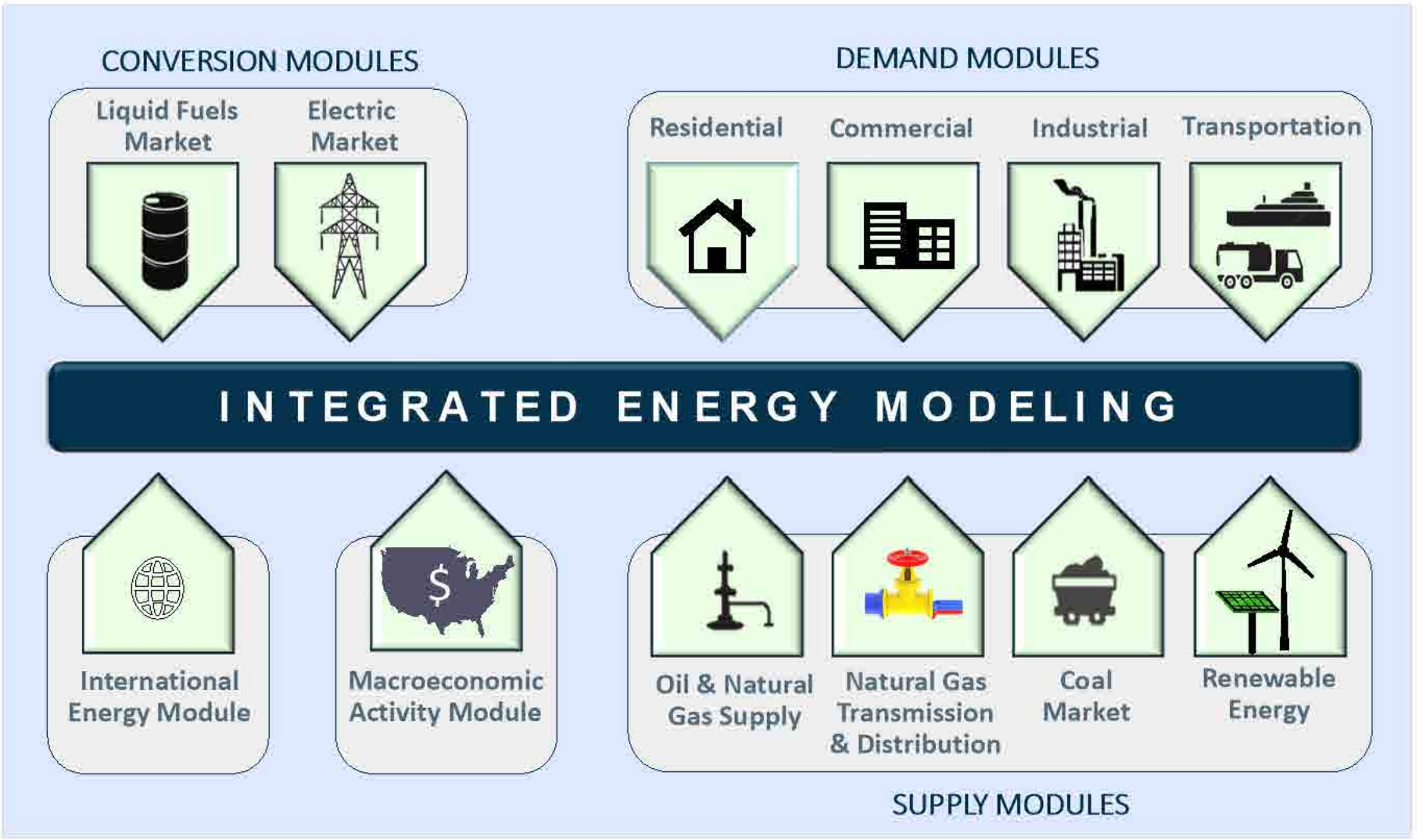
# National Energy Modeling System

**Development & Application of Energy System Models:**

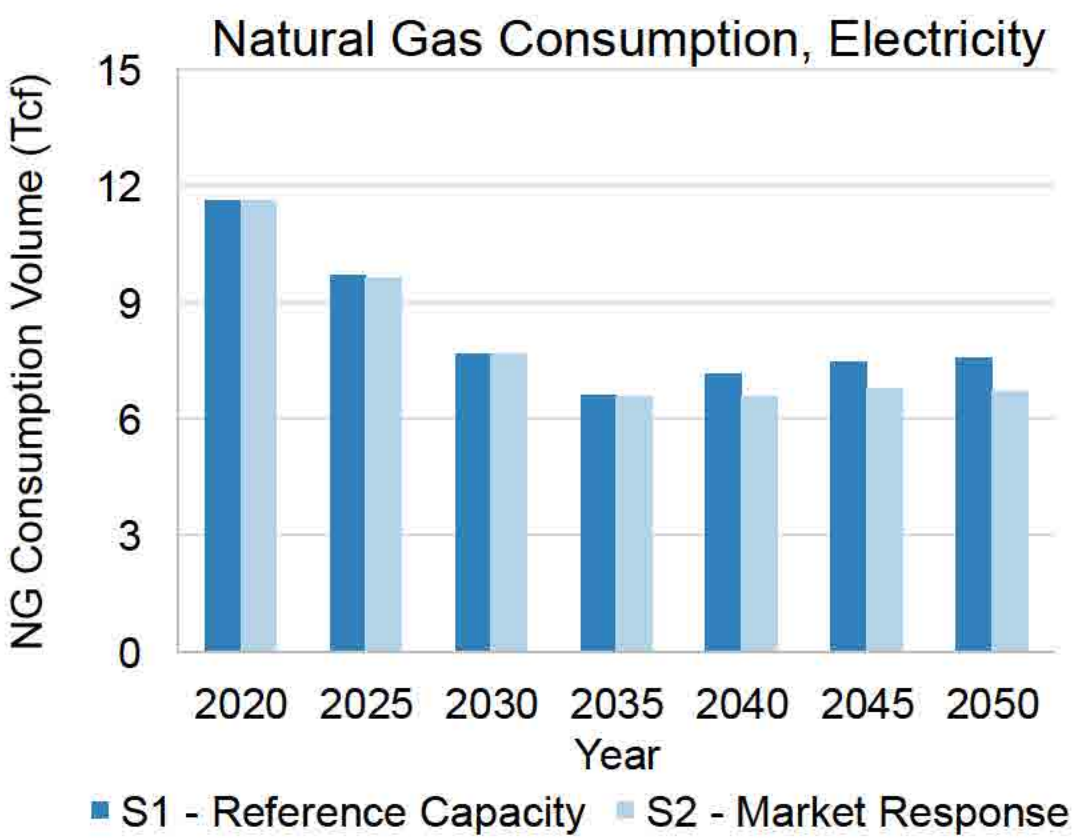
- Analyzing Energy and Climate Policy Impacts
- Assessing New Energy Technologies
- Informing Cost-effective Approaches and Policies (Government, industry, and NGOs)

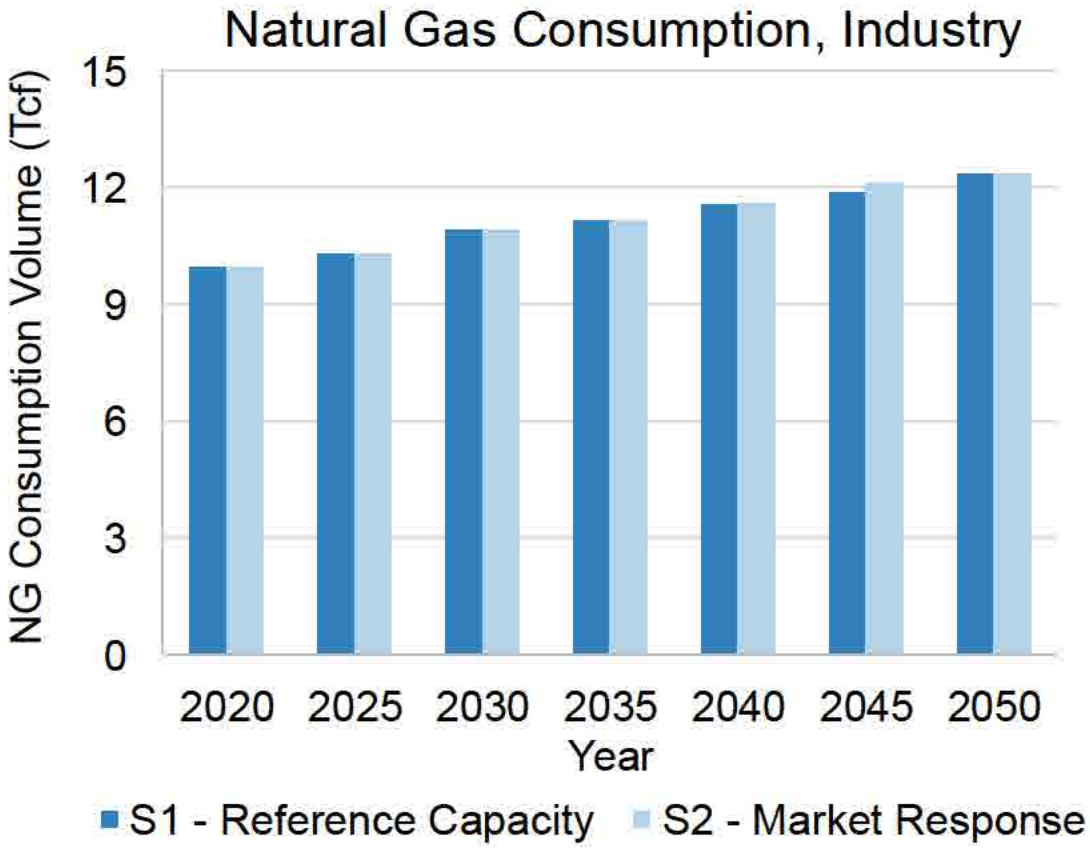
**Customization & Analyses:**

- Inflation Reduction Act
- Direct Air Capture
- Carbon Capture technologies
- Hydrogen Economy

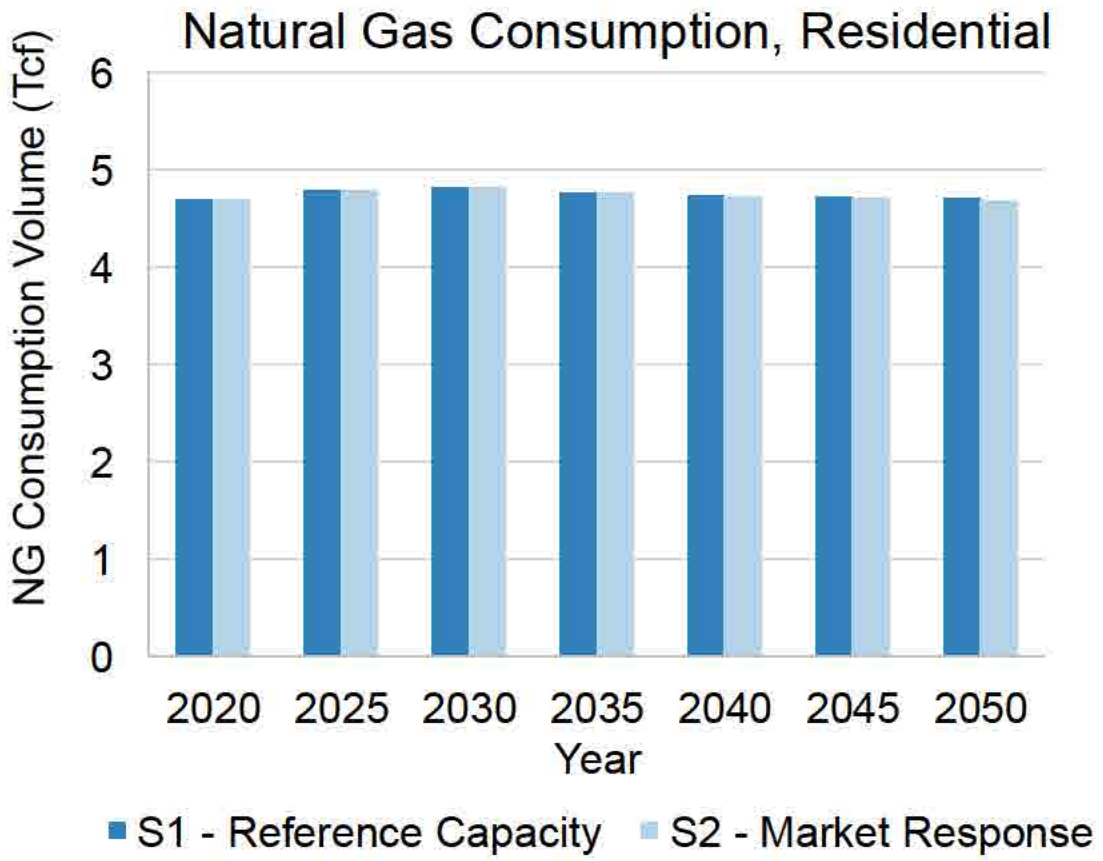


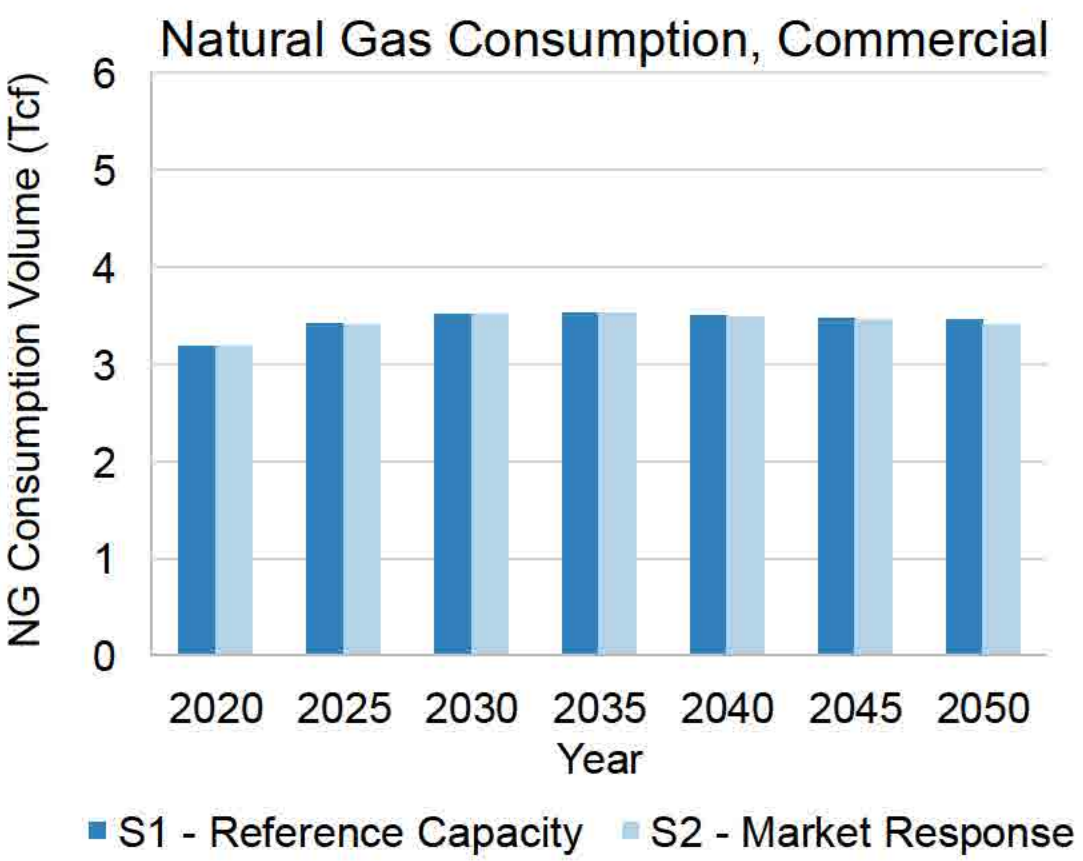
# U.S. NG Consumption by Sector, S1 and S2



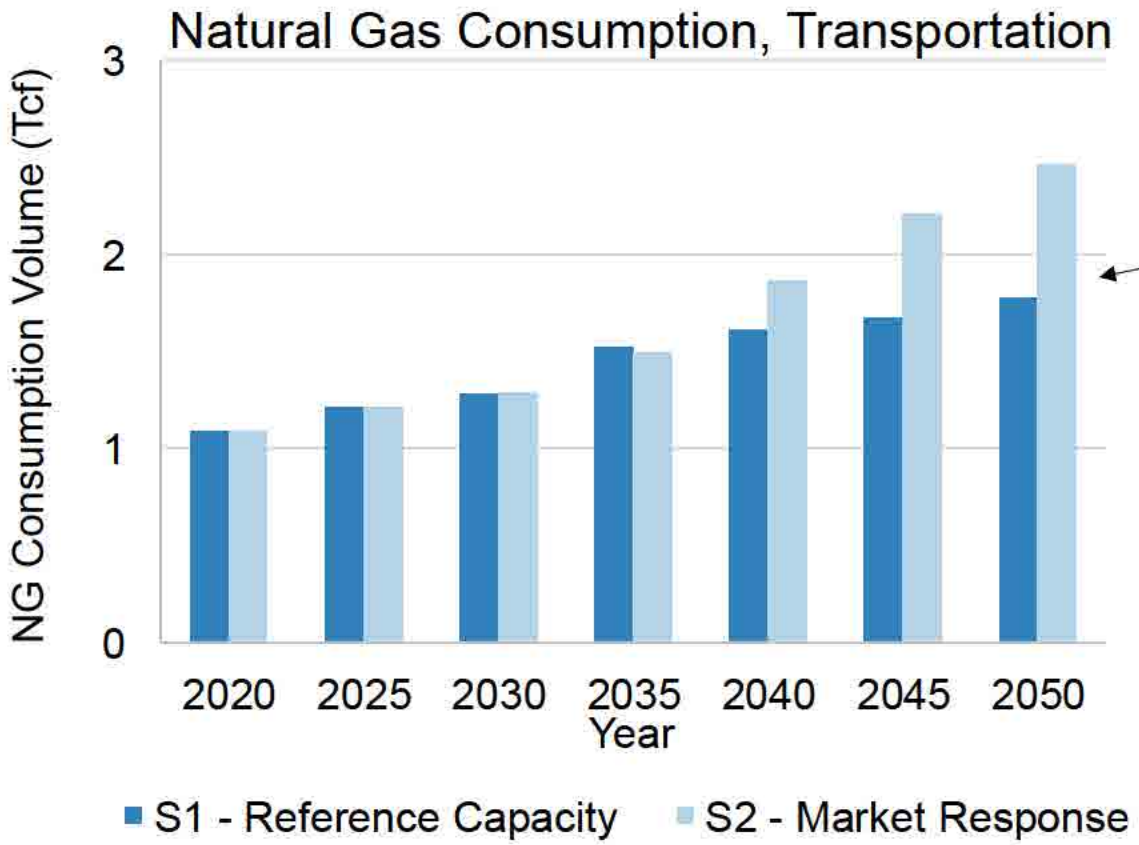



# U.S. NG Consumption by Sector, S1 and S2



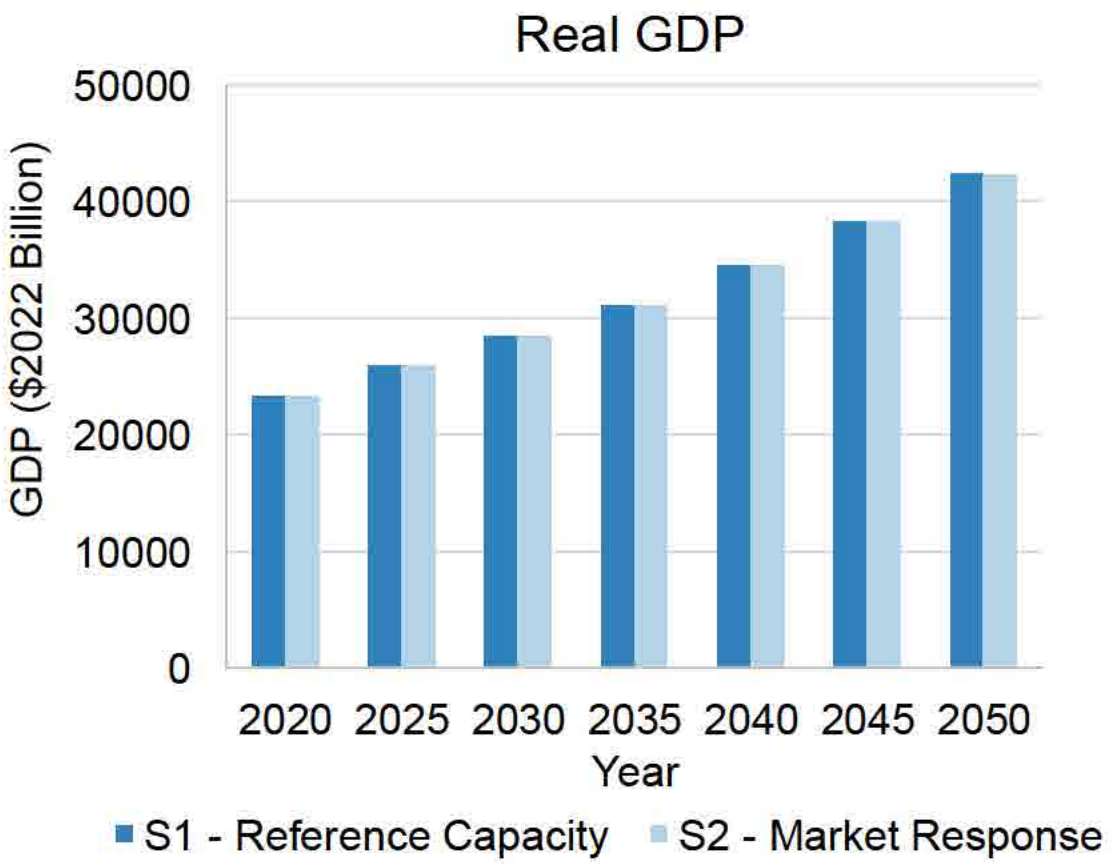



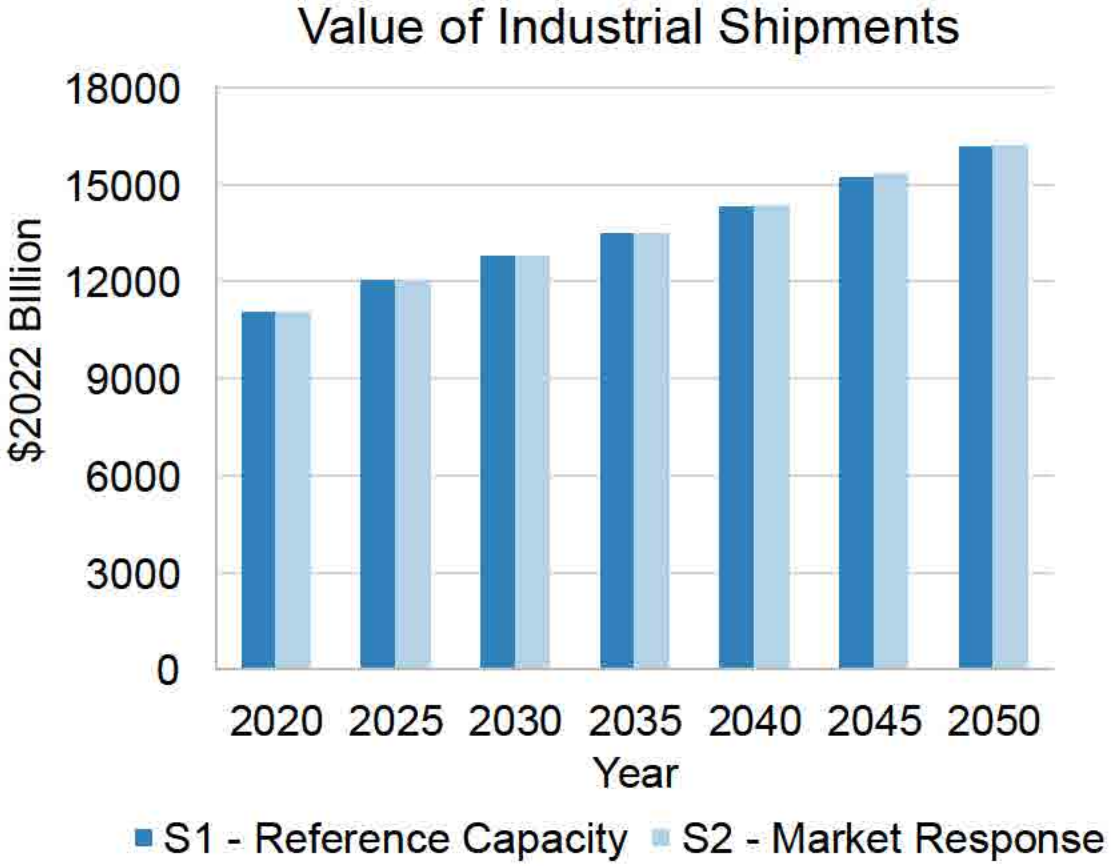
# U.S. NG Consumption by Sector, S1 and S2



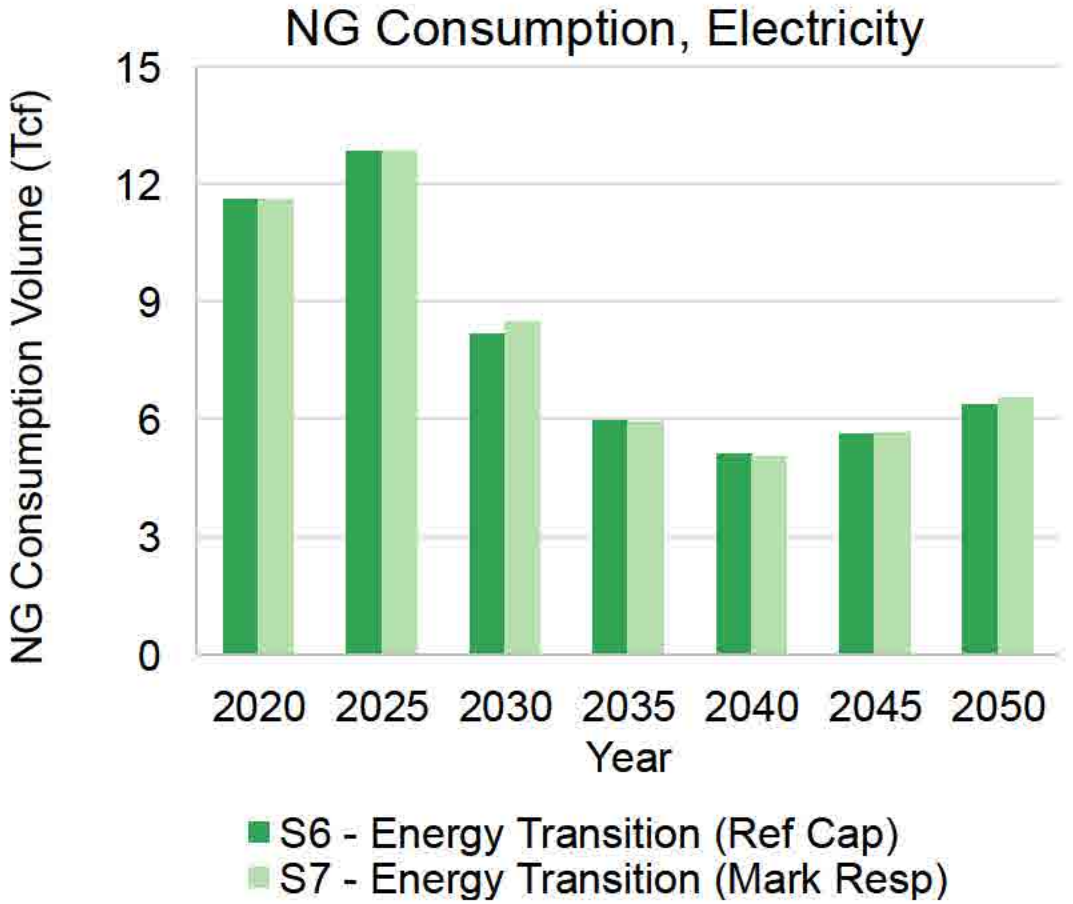

Difference comes from pipeline fuel for LNG infrastructure

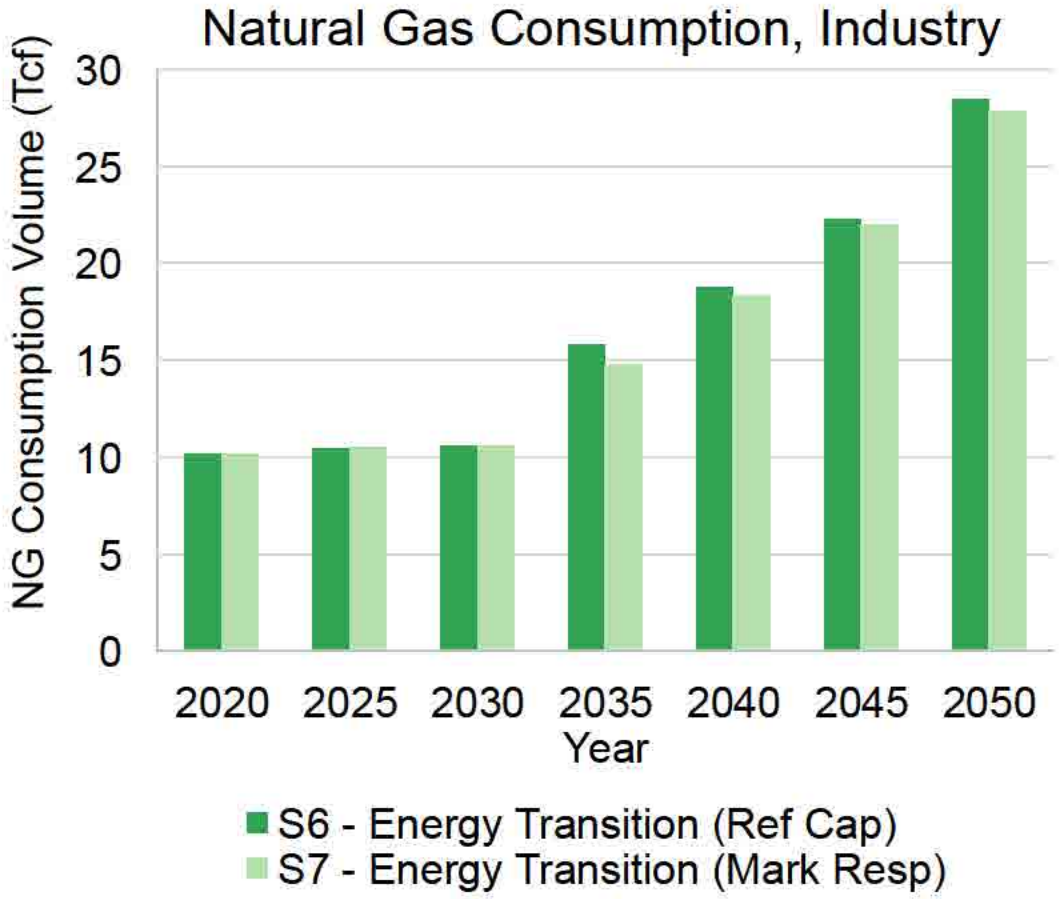
# U.S. Economic Results



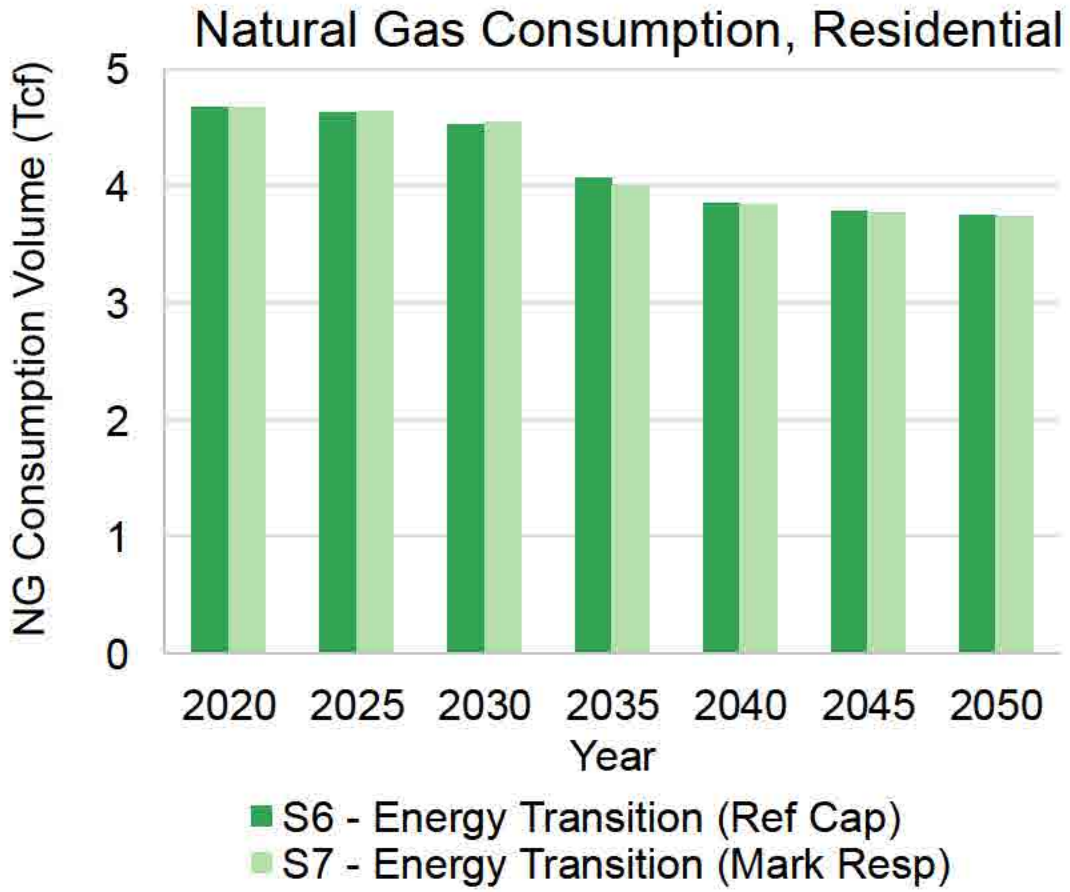



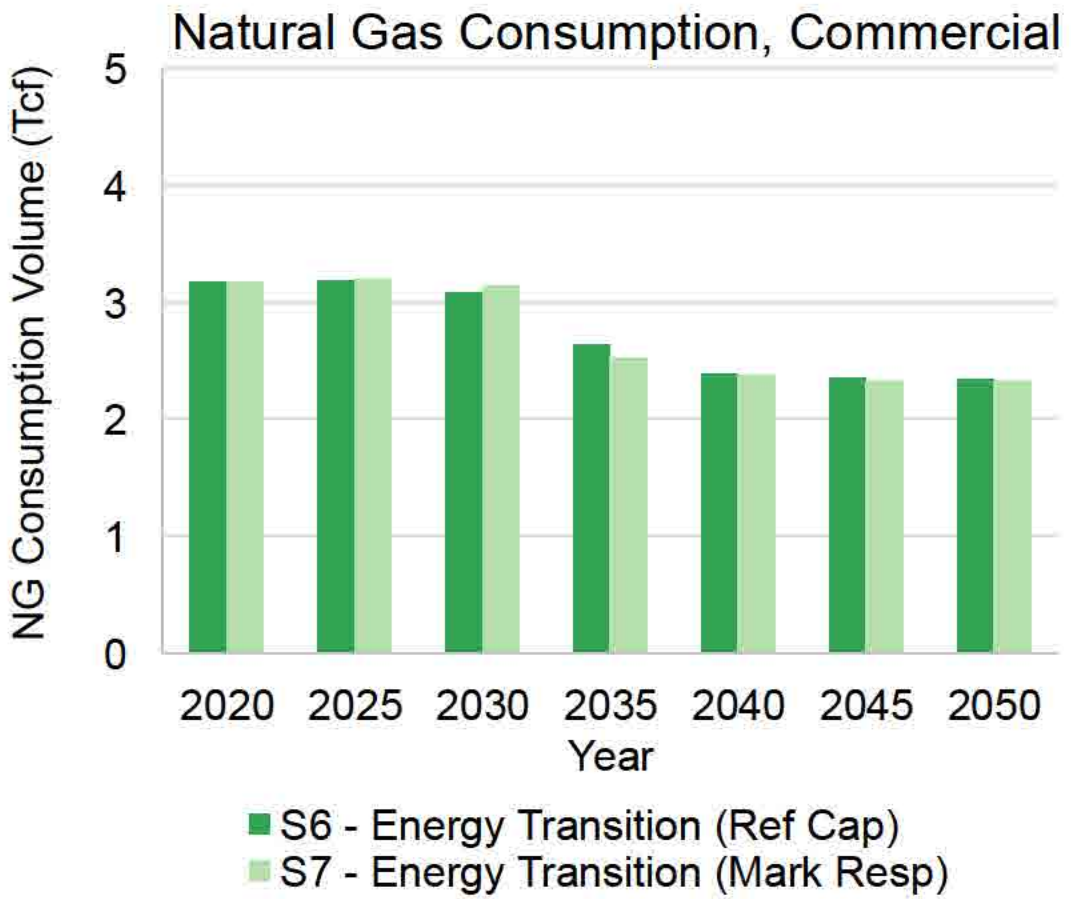
# U.S. NG Consumption by Sector, S6 and S7



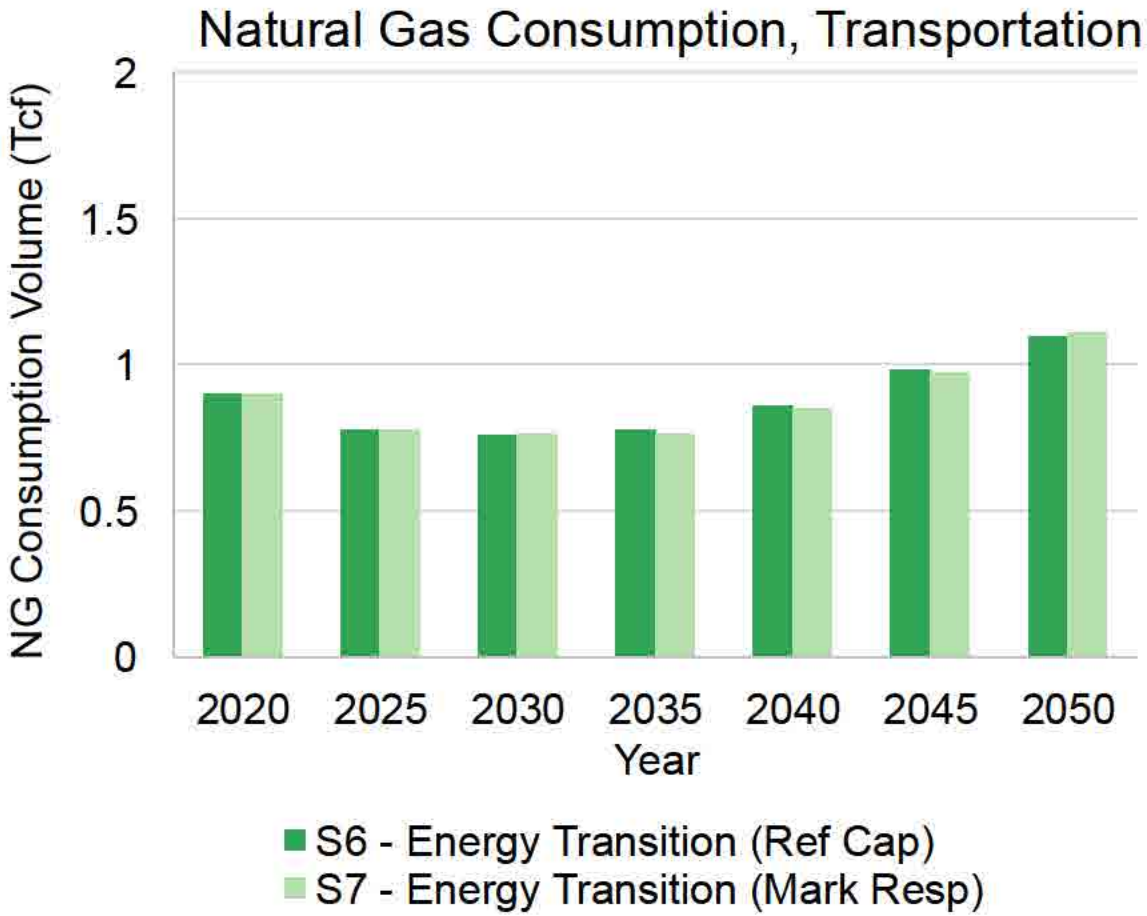



# U.S. NG Consumption by Sector, S6 and S7



# U.S. NG Consumption by Sector, S6 and S7



**From:** Skone, Timothy
**Sent:** Fri, 20 Oct 2023 15:39:20 +0000
**To:** Matthews, Howard Scott (CONTR); Jamieson, Matthew B (NETL)
**Subject:** RE: Draft LNG Study MAF Interpretations Memo for FECM
**Attachments:** LNG MAF Interpretation Memo.docx

Thanks Scott!

Two initial reactions in the attached.

Also, what was the general thinking from the broader modeling group on adjusting the MAF conclusion.

Tim

---

**From:** Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Sent:** Friday, October 20, 2023 10:50 AM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>; Jamieson, Matthew B (NETL) <matthew.jamieson@netl.doe.gov>
**Subject:** Draft LNG Study MAF Interpretations Memo for FECM

Gentlemen: Apologies for the delay, but there were some productive discussions with the GCAM team that have been incorporated beyond what we previously had done and discussed.

It ended up being longer than expected, but frankly it is because I included all tables and graphs we have been discussing. Its possible we can cut several of them (or move them to an appendix) to keep it briefing-friendly.

Regardless, any comments are welcomed.

Scott

Scott Matthews | **Principal Scientist**
he/him
m: (b) (6) | keylogic.com
3168 Collins Ferry Rd, Morgantown, WV 26505
KEYLOGIC

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**********

# DRAFT-DELIBERATIVE-PREDECISIONAL

To: Matt Jamieson and Tim Skone
From: Scott Matthews
CC:
Date: October 20, 2023
RE: Synthesis of Thoughts on Interpreting the Market Adjustment Factors in the FECM LNG Export Study

## INTRODUCTION

The LNG Analysis project is a collaborative effort between NETL (specifically the LCA competency), On-Location (specifically the National Energy Modeling System (NEMS) modeling team), and Pacific Northwest National Laboratory (PNNL, specifically the Global Change Assessment, or GCAM, modeling team). This project seeks to quantitatively assess the expected global effects of different quantities of US LNG exports.

Past studies done by NETL on LNG have largely been techno-economic analyses focused on expected costs per unit delivered (landed) or attributional life cycle analyses that only estimate the emissions and other impacts associated with units of LNG delivered. These LCA studies are limited in that they have not, to date, considered the consequences of delivering LNG, such as how domestic or foreign energy markets may be affected by increasing the supply of natural gas (e.g., whether, given additional supply, natural gas-fired power plants in Europe might take market share from other types of electric plants). Such market-based effects could lead to increases or decreases in GHG emissions.

In this project, the LCA component seeks to determine the consequences of additional exported volumes of US LNG, such as how additional available quantities of natural gas led to changes in the energy sectors of countries that purchase the LNG. These consequential effects are estimated by tracking differences in global $CO_2$ emissions and quantities of US LNG exported from the GCAM model scenarios. The result is a market adjustment factor (MAF) using the following equation, and would be considered a value to be combined with usual upstream LCA results for production of natural gas (currently -5.3 on an IPCC AR6-100 year basis).

$$MAF_{scenario\ n} = \frac{Global\ Emissions_{scenario\ n} - Global\ Emissions_{scenario\ 1}}{US\ LNG\ Exports_{scenario\ n} - US\ LNG\ Exports_{scenario\ 1}}$$

In this memo, we seek to provide additional background context on the data and methods that lead to the currently drafted MAF results (which may not appear in the final report), to ensure internal stakeholders are aware of them and to attempt to converge on appropriate text that frames these contextual issues.

## ADDITIONAL ANALYSIS

Application of the MAF equation leverages GCAM results (and uses past NETL reports to harmonize them) that are meant to quantify the effect on global $CO_2e$ emissions from increased US LNG exports. This global MAF is *calculated annually*, including interpolation of GHG and LNG scenario results between the 5-year GCAM timesteps, and is *reported cumulatively* over the 35-year time horizon of the study. In the recently reviewed version of the report, the global MAFs on an IPCC AR6-100 basis for Scenario 2 (vs. Scenario 1) was estimated at -5 g $CO_2e$/MJ and for Scenario 7 (vs. Scenario 6) was estimated at -3 g $CO_2e$/MJ. These results suggest that export of US NG leads to lower global emissions.

Such a result might be applied to support US LNG export authorization decisions. While these export authorizations are not contingent on knowing where the LNG might go, the reality is the LNG will go to a specific region and not to "the world" (and as discussed throughout the project, GCAM has a global LNG pool from which regions import it, and does not model explicit trades of LNG to or from any region).

We elected to attempt to look at the GCAM results *regionally* to attempt to quantify similar MAF values for all regions, but especially for expected future importers of LNG (e.g., China, India, Europe, Japan, and South Korea). As such, we developed a slightly different MAF equation of "delta CO2e for each region" divided by "delta ***imported*** LNG" for that region. We note that this creates several issues:

- This was not the focus of the original model, which was set up to focus on changes of exporting US LNG (as the control variable)
- GCAM has a global pool and thus we can not associate their reductions with US LNG
- By focusing on delta imported LNG, rather than "delta NG consumption" overall, we miss potential differences that exist from how regional markets choose local, pipeline, or LNG in its consumption mix, and such interactions are a feature of GCAM that is lost

In these hypothetical results, some are positive and some are negative. Table 1 summarizes these regional MAFs for a subset of GCAM regions From Table 1, China, Japan and EU-15 regions have slightly positive regional MAFs (suggesting emissions would increase), and the South Korea and India regions are slightly negative (decreasing emissions). Not obvious in the table is that if all four European GCAM regions are aggregated, its result is -4 g $CO_2e$/MJ. Some regions with large absolute values of MAFs are an order of magnitude higher, but they are small importers in the GCAM results. An overall takeaway from this analysis is that the "regional MAFs" in the most prominent importers are generally bounded to a range of approximately -5 to +10 g $CO_2e$/MJ of gas imported.

**Commented [ST1]:** Are you recommending this range as the study results on MAF values to replace the single -5 value?

If yes, what do recommend as a the expected value? Asusming -5 and +10 braket the likley range (not sure what the correct statistical terms should be).

**Table 1: Hypothetical Regional Market Adjustment Factors for GCAM Regions (S2)**

| Region | Cumulative MAF |
|---|---|
| USA | 45.74 |
| Australia_NZ | 45.50 |
| Africa_Eastern | 16.40 |
| Pakistan | 9.40 |
| **Japan** | **9.21** |
| **EU-15** | **7.94** |
| Southeast Asia | 4.46 |
| Taiwan | 3.63 |
| Mexico | 2.53 |
| **China** | **2.30** |
| **South Korea** | **-0.81** |
| Europe_Non_EU | -1.93 |
| Africa_Southern | -2.02 |
| South Africa | -2.57 |
| **India** | **-4.36** |
| Brazil | -4.94 |
| Colombia | -6.04 |
| European Free Trade Association | -6.59 |
| Argentina | -9.58 |
| Africa_Western | -17.36 |
| Middle East | -19.24 |
| Europe_Eastern | -25.47 |
| South America_Northern | -26.29 |
| Russia | -29.71 |
| Indonesia | -32.31 |
| Central Asia | -33.27 |
| Canada | -50.11 |
| EU-12 | -54.76 |
| Africa_Northern | -64.61 |
| South America_Southern | -66.75 |
| Central America and Caribbean | -87.06 |

*Note: (note that USA and Australia do import a small amount of LNG, which is why the large MAFs –net imports were not modeled, but it would not affect the main regions of interest).*

Another underlying dynamic to synthesize is the issue of calculating and reporting the MAF annually vs. cumulatively. Figures 1 and 2 show the annual (red lines) and cumulative MAF values (blue lines) for the same subset of regions and also a zoom in on just the selected

regions highlighted above. The value of the blue line at 2050 in these figures is the value in the table above.

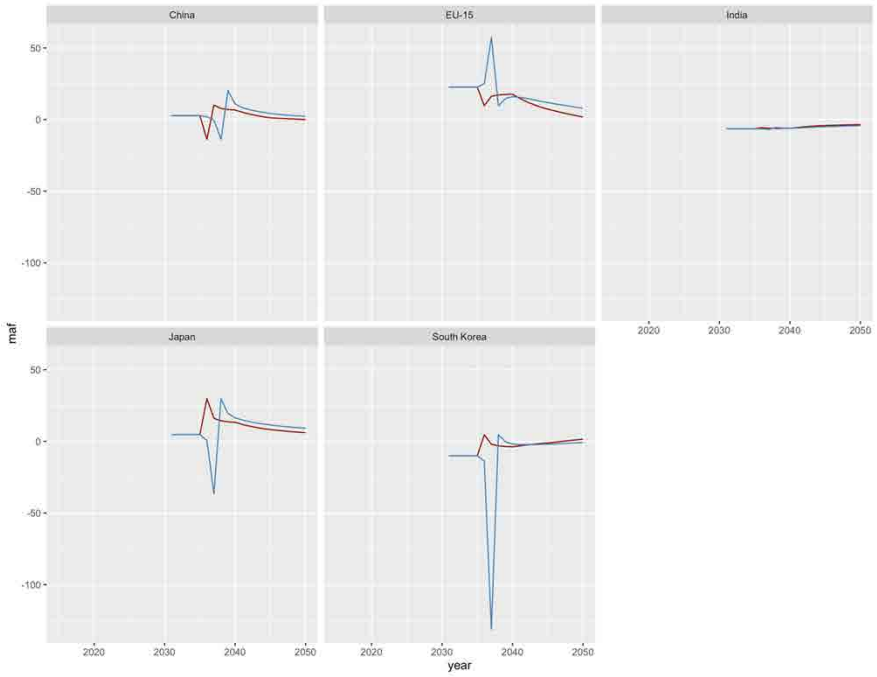



Figure 1: Hypothetical Regional MAFs for Expected Top Import Partners for US LNG in the Future

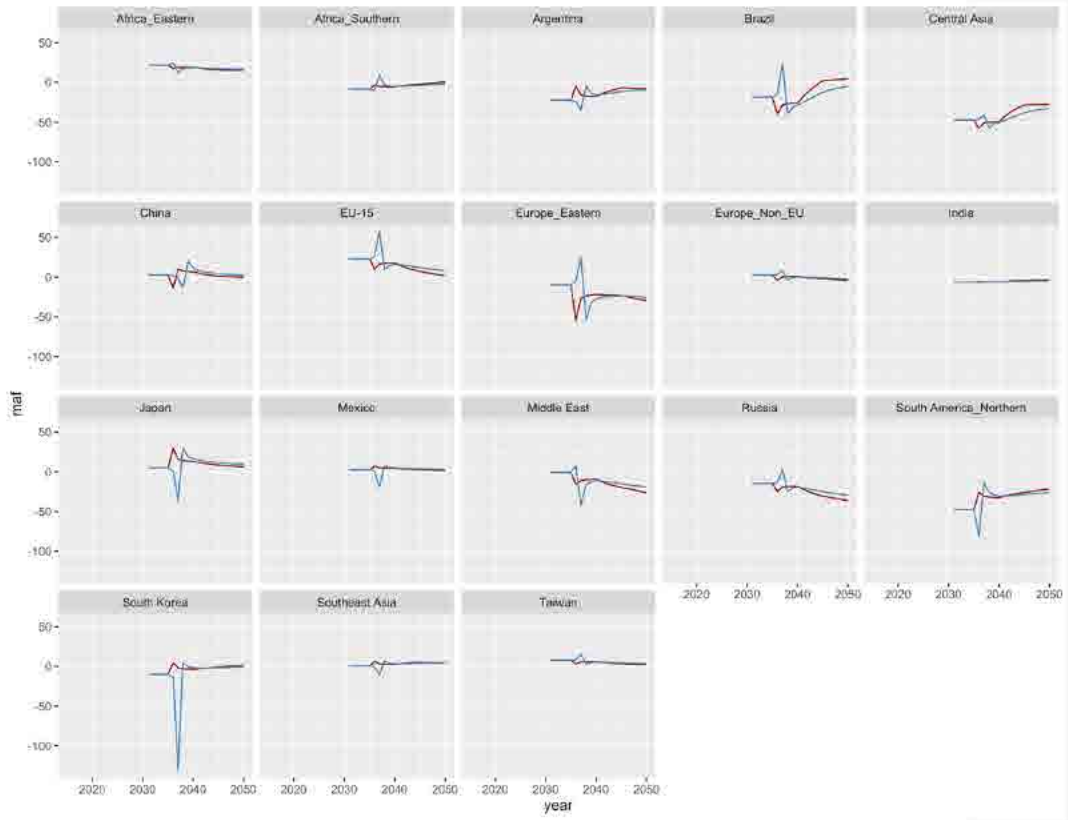



Figure 2: Hypothetical Regional Results for Expected Top Import Partners for US LNG in the Future

Figure 3 shows the not previously shown time series of annual and *global* MAF values that have been previously summarized in the report (and memo, above).

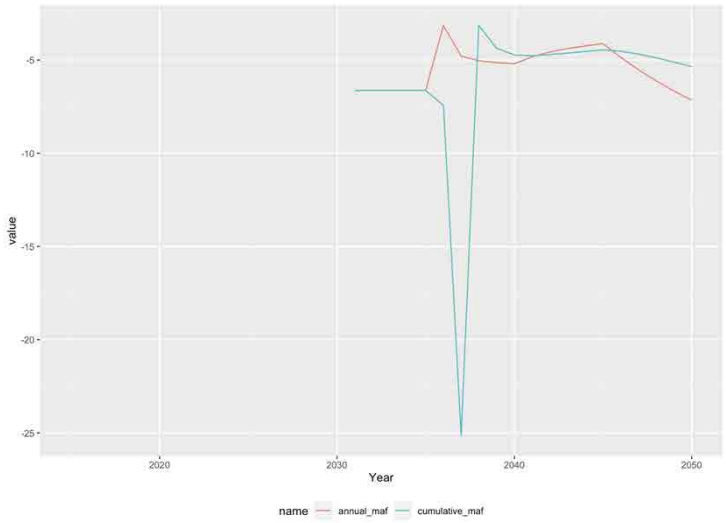



Figure 3: Global Annual and Cumulative MAFs

These results show that there are some negative-positive spikes of annual MAF values in the period 2035-2040, which happen due to a few reasons:

(1) The scenario results for $CO_2e$ and LNG finally start to differ in that time period (but recalling that S1 and S2 separately depend on GCAM or NEMS for the underlying LNG export values)

(2) As they only differ in this time period by a small amount in this time period, small and less than 1 values in the (delta LNG) denominator can lead to visible (swings in) MAF results.

(3) There are changes in the sign of the CO2e and LNG deltas or the MAF (e.g., initially negative/negative = positive and then a slight change in one value and its then -/+ = negative), and vice versa

(4) Interpolating the underlying values ($CO_2$ emissions, LNG exports) between 5-year model timesteps separately before dividing them, rather than interpolating the every 5 year MAF results.

Finally, additional care may be needed in describing the presentation and application of the cumulative MAF values as the default metric in the study. While LNG is going to be exported in a particular year into the global market (e.g., 2025), which would lead to a specific set of emissions (if we believed the model, it would be the specific value shown for that year in the graph), the *cumulative* MAF (blue line value at 2050) is what is summarized in the study. While the decisions or authorizations are connected to these annual emission and MAF results, there are biases that could be introduced if only the annual (or 5-year cumulative period) MAFs were

used (for example, a five year period with a positive or negative value when the cumulative is the opposite). It thus seems appropriate to assume that exports would continue for the foreseeable future into the global market, and while the graphical results show how they might vary year to year, the cumulative result is an appropriate metric.

**Commented [ST2]:** At what time step interval? 15, 20, 30, 35, 50 years? How do we determine the correct cumulative time period? Basing it on the export authorization time period for consistency? Or a point with greater market certainty?

**From:** Skone, Timothy
**Sent:** Thu, 13 Apr 2023 20:19:54 +0000
**To:** Jamieson, Matthew B.
**Cc:** Blackhurst, Michael (NETL); Matthews, Howard Scott (CONTR); Khutal, Harshvardhan (CONTR)
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data
**Attachments:** 2022_ghgi_natural_gas_systems_annex36_tables.xlsx

Thanks Matt – next week sounds good.

Attached is the Year 2020 Data GHGI Annex data.

2022_ghgi_natural_gas_systems_annex36_tables.xlsx (live.com)

Tim

---

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, April 13, 2023 2:45 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Blackhurst, Michael (NETL) <michael.blackhurst@netl.doe.gov>; Matthews, Howard Scott (CONTR) <scott.matthews@netl.doe.gov>; Khutal, Harshvardhan (CONTR) <Harshvardhan.Khutal@netl.doe.gov>
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data

In the interest of making sure we can answer all the questions below, I would say we should meet early next week. Harsh is supposed to be back in on Monday, so that might help expedite things as well. More details to follow.

I'll respond to one question in red text below based on what I saw earlier today while investigating the transmission fugitive emission.

**Matt Jamieson**
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis & Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) (b)(6) (mobile)

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Thursday, April 13, 2023 1:25 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Cc:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>; Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>; Khutal, Harshvardhan (CONTR) <Harshvardhan.Khutal@netl.doe.gov>
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data

Yes, it is. I didn't scroll past Line 51 and saw the original comparison at 27.5%.

Thanks for pointing out the updated summary!

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, April 13, 2023 1:22 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Blackhurst, Michael (NETL) <michael.blackhurst@netl.doe.gov>; Matthews, Howard Scott (CONTR) <scott.matthews@netl.doe.gov>; Khutal, Harshvardhan (CONTR) <Harshvardhan.Khutal@netl.doe.gov>
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data

Real quick on the first question….

I think what you're looking for is here: Worksheet "EPA GHGI Summary - HK and MB" A62:I73. Please let me know if you're looking for something different.

**Matt Jamieson**
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis & Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Thursday, April 13, 2023 1:18 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Cc:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>; Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>; Khutal, Harshvardhan (CONTR) <Harshvardhan.Khutal@netl.doe.gov>
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data

Thanks Matt and Team for the response below.

Yes, a discussion would be good.

A few first reaction questions/comments:

1. Is there a breakdown by stage of the variance between the 2020 GHGI and NETL 2020 results? Looking for the summation that led to the 21.1% lower than GHGI" concluding statement.
   Previously answered
2. The GHGI data appears to be the 2021 GHGI representation of year 2020 performance. EPA updates their methodology annually and then applies the changes retrospectively to the prior years to report the time series using a consistent methodology. This appears to being causing variance in the comparison. We will need the original 2020 data to make comparative statements on how we compare to the GHGI.
3. Transmission CO2 emissions from LNG – does the NETL model exclude LNG operations form the GHGRP reported data?
   a. I believe the answer is yes, as the model treats LNG operators as a "large end-user" of natural gas and therefore excludes them from the GHGRP data pull.
   b. How was the CO2 and CH4 contributions from LNG determined from the GHGI data?
      i. Reference values reported in spreadsheet: Emissions from LNG stations account for 86% of CO2 emissions for this stage under GHGI data; Emissions

from LNG stations account for 1% of CH4 emissions for this stage under GHGI data
It looks like in the previously provided worksheets, the GHGI tables are summaries. The annex tables (example here https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.epa.gov%2Fsites%2Fdefault%2Ffiles%2F2020-02%2F2019_ghgi_natural_gas_systems_annex36_tables.xlsx&wdOrigin=BROWSELINK), Worksheet 3.6-10 shows separate categories for LNG Storage and LNG Terminals. If you're interested , I'm sure the team could provide the annex tables they used to develop those percentages, but I think that example is fairly clear on CO2 emissions and is probably still relatively accurate despite being 2017.

4. Production – NETL model pulls the actual data from GHGRP, same data used by the GHGI. We than add/replace liquids unloading emissions, this increases the emissions reported for production. We should have the same Appalachian production share (and equivalent shares for the major basins we report [note, we do group some smaller basins and apply the national average from the NETL major basin representation.]
    a. Did GHGI do something different to the GHGRP data?
    b. Is our application of a NETL Reported Basin average applied to the non-reported gas basin data the source of variance?
    c. Have we replaced any production data with field measured data – therefore different than GHGI factors?
5. G&B – Exhibits 4-12 and 4-13 in the report outline the changes from the GHGRP/GHGI emission factors for G&B, in general the updated emission factors are higher than what we had used previously, with some exceptions. May need to assess at influence at the parameter level to justify why the decrease compared to GHGI.
6. Stopped for now.

I am open tomorrow from 9 to 11 if that time works for you and the Team. The objective would be to better understand what parameters are influencing the change form GHGI. If you prefer more time, we can meet early next week.

Thanks,

Tim

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**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, April 13, 2023 10:25 AM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Blackhurst, Michael (NETL) <michael.blackhurst@netl.doe.gov>; Matthews, Howard Scott (CONTR) <scott.matthews@netl.doe.gov>; Khutal, Harshvardhan (CONTR) <Harshvardhan.Khutal@netl.doe.gov>
**Subject:** RE: NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data

Tim,

Please see the attached updated comparison to GHGI. I've cc'd the team so that they can correct me if I mis-state anything.

- There are two sets of GHGI data in this updated comparison – your original work and then the team pulled together their own data from the 2021 GHGI. As best as I can tell, the most significant update was with transmission stage CO2. Apparently the majority of CO2 emissions are from LNG processes reported at that stage. They've been adjusted accordingly. Other than that, the differences seem relatively minor.
- I pasted in the new results from the most recent model runs for US average. The main update here of course is increased methane emissions at transmission compression – closes the gap a little bit at that stage.
- There is now a stage-wise comparison in CO2e vs only for methane.
- The team noted the following reasons for the discrepancies:
    - Production – updated methodology for estimation of production shares (i.e., more production from App Shale). I will also add that the difference between GHGI and our data is relatively small here – 14.1%.
    - G&B - Updated emission factors in G&B stage (based on GSI (2018) and Zimmerle (2019)) have reduced emissions intensity in NETL US avg results
    - Processing – our results are actually 5% higher. Team notes regionalization of processing stage.
    - Transmission and storage - Updated fugitive EF for transmission pipeline stage - as estimated during T&D work (96% lower GHG intensity for 2020 as compared to 2017 results). This is the primary reason for the difference between the two. I will admit here after looking at the article and our report, it's not clear to me what the updated fugitive EF is between 2017 and now…at least I didn't see explicit discussion. I can see that reciprocating compressor methane emissions are much lower than in 2017. Pipeline blowdowns and fugitives are also much lower, which I would guess is the source of the comment.
    - Distribution – we're higher here. Updated EFs for distribution stage - commercial and industrial meters based on measurement studies

The final result is that our US average result is 21.1% lower than GHGI. Let me know if you would like to have a call. For the most part it looks like the primary difference is "measured data," it's just that the measured data lowered the results for the most part.

**Matt Jamieson**
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis & Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

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**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Tuesday, March 21, 2023 4:06 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** NETL 2020 NG LCA is 25% Lower Than EPA GHGI for 2020 Data
**Importance:** High

Matt,

I am concerned that the 2020 NETL result are lower than expected.

I pulled the EPA GHGI for the NG sector in 2020 and compared the results. I had to remove stationary combustion emissions from the NETL profile and remove Post-Meter emissions from the EPA GHGI to align the data for comparison.

The attached spreadsheet contains my comparison. In general, we are lower than the GHGI by 25%.

In general, I would have expected our results to be higher than the GHGI due to the addition of measured data.

Can you have the Team check my numbers (is my comparison correct) and secondly explain why we are lower?

Something doesn't feel right with our results.

Thanks,

Tim

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**File Updated April 6, 2022**

## Table 3.6-1: CH4 Emissions (kt) for Natural Gas Systems, by Segment and Source, for All Years

**Emissions in this table reflect NET emissions at the emission source-level. The reductions include Gas STAR, Methane Challenge, and regulatory reductions.**

This is a change from previous GHGIs which displayed potential emissions in Table 3.6-1.

**Table Footnotes:**

"NE" indicates value not estimated

"IE" indicates the emissions were included elsewhere (i.e, the emissions are included at an aggregated level)

[a] Plant grouped emission sources include fugitives, compressors, dehydrators, and flares

| Segment/Source | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **118.8** | **118.7** | **87.4** | **110.0** | **109.3** | **103.8** | **120.4** | **166.1** | **151.0** | **171.3** | **230.8** | **302.0** | **240.1** | **277.8** | **314.6** | **358.5** | **408.0** | **405.2** | **426.8** | **243.6** | **237.5** | **226.2** | **96.5** | **113.2** | **36.4** | **42.9** | **27.4** | **48.5** | **93.7** | **75.4** | **8.2** |
| Non-completion well testing - vented | 1.0 | 1.1 | 1.1 | 1.1 | 1.2 | 1.1 | 1.2 | 1.3 | 1.3 | 1.3 | 1.4 | 1.5 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 0.6 | 0.1 | 0.0 | 0.0 | 0.001 |
| Non-completion well testing - flared | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.08 | 0.02 | 0.0 |
| HF Completions - Non-REC with Venting | 109.7 | 109.1 | 78.3 | 100.5 | 99.5 | 94.3 | 109.8 | 154.7 | 139.5 | 159.4 | 217.7 | 285.7 | 223.7 | 258.6 | 292.2 | 331.9 | 376.1 | 370.2 | 386.6 | 212.8 | 204.6 | 189.8 | 65.1 | 89.5 | 26.5 | 1.4 | 1.2 | 3.0 | 1.2 | 0.7 | 0.1 |
| HF Completions - Non-REC with Flaring | 1.6 | 1.5 | 1.1 | 1.4 | 1.4 | 1.3 | 1.6 | 2.2 | 2.0 | 2.3 | 3.1 | 4.2 | 3.5 | 4.2 | 5.0 | 5.9 | 7.1 | 7.4 | 8.2 | 4.8 | 4.9 | 6.5 | 3.3 | 1.5 | 0.9 | 0.4 | 0.1 | 0.5 | 0.6 | 0.4 | 0.1 |
| HF Completions - REC with Venting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 1.3 | 2.4 | 3.8 | 5.6 | 8.1 | 9.8 | 12.4 | 8.2 | 9.4 | 10.9 | 10.6 | 8.7 | 2.7 | 15.8 | 12.6 | 37.7 | 29.0 |
| HF Completions - REC with Flaring | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.4 | 0.7 | 1.1 | 1.6 | 2.3 | 2.8 | 3.6 | 2.3 | 2.7 | 3.1 | 3.9 | 4.5 | 2.3 | 0.8 | 4.6 | 5.7 | 1.3 | 1.0 |
| Non-HF Completions - vented | 5.7 | 6.4 | 6.3 | 6.5 | 6.8 | 6.6 | 7.0 | 7.4 | 7.7 | 7.7 | 7.9 | 8.6 | 8.9 | 9.4 | 9.8 | 10.4 | 11.1 | 11.6 | 12.5 | 12.6 | 12.9 | 13.1 | 11.1 | 6.4 | 1.4 | 14.2 | 8.2 | 0.8 | 0.3 | 0.8 | 2.2 |
| Non-HF Completions - flared | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.00 | 0.04 | 0.01 | 0.04 | 0.1 | 0.7 | 0.2 | 0.0 | 0.0 |
| Well Blowouts | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 60.0 | 53.8 | 0.0 |
| Well Drilling | 0.8 | 0.4 | 0.6 | 0.4 | 0.4 | 0.3 | 0.9 | 0.5 | 0.5 | 0.5 | 0.6 | 0.7 | 0.8 | 0.7 | 0.8 | 1.0 | 1.1 | 1.3 | 1.3 | 1.3 | 0.6 | 0.6 | 0.5 | 0.3 | 0.3 | 0.2 | 0.1 | 0.1 | 0.2 | 0.9 | 0.8 |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Potential Emissions | 2,451.4 | 2,602.3 | 2,606.3 | 2,676.9 | 2,792.4 | 2,722.8 | 2,852.3 | 2,962.3 | 2,999.1 | 2,946.3 | 3,028.1 | 3,221.6 | 3,242.6 | 3,345.5 | 3,425.1 | 3,419.3 | 3,685.2 | 3,792.4 | 3,993.4 | 3,963.9 | 3,889.6 | 3,901.4 | 3,917.1 | 3,912.7 | 3,797.2 | 3,788.1 | 3,701.2 | 3,812.5 | 3,843.0 | 3,802.0 | 3,547.0 |
| Reductions (Includes GasSTAR, MC, and Regulatory) | 0.0 | 0.0 | 0.0 | 6.8 | 8.9 | 9.2 | 21.6 | 29.1 | 38.9 | 62.0 | 58.0 | 62.6 | 61.1 | 75.2 | 86.5 | 83.0 | 98.4 | 107.1 | 137.0 | 141.6 | 163.9 | 168.1 | 99.5 | 100.0 | 94.1 | 95.3 | 96.4 | 107.9 | 90.3 | 91.8 | 91.6 |
| **Net Emissions** | **2,451.4** | **2,602.3** | **2,606.3** | **2,670.1** | **2,783.5** | **2,709.9** | **2,830.7** | **2,933.2** | **2,960.2** | **2,884.4** | **2,970.1** | **3,159.0** | **3,181.5** | **3,270.3** | **3,338.7** | **3,336.3** | **3,586.9** | **3,685.3** | **3,856.4** | **3,822.3** | **3,725.7** | **3,733.3** | **3,817.6** | **3,812.6** | **3,703.1** | **3,692.8** | **3,604.8** | **3,704.7** | **3,752.7** | **3,710.2** | **3,455.4** |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wells) | 13.2 | 13.9 | 14.4 | 14.6 | 15.4 | 14.6 | 15.1 | 15.5 | 15.8 | 16.0 | 16.2 | 17.1 | 17.5 | 17.9 | 18.7 | 19.2 | 20.0 | 20.8 | 21.5 | 21.4 | 21.2 | 21.2 | 21.0 | 20.5 | 20.1 | 20.1 | 19.5 | 19.1 | 18.8 | 18.4 | 17.9 |
| Gas Wells with Hydraulic Fracturing | 5.8 | 6.9 | 7.2 | 7.7 | 8.4 | 8.7 | 9.3 | 10.0 | 10.5 | 10.6 | 12.0 | 14.0 | 15.5 | 17.1 | 18.5 | 20.5 | 22.7 | 25.3 | 27.7 | 28.6 | 29.0 | 29.9 | 30.1 | 29.7 | 29.6 | 29.8 | 29.7 | 29.5 | 29.4 | 29.4 | 29.1 |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | 12.2 | 12.8 | 13.4 | 13.8 | 14.1 | 14.5 | 15.1 | 15.1 | 14.6 | 14.0 | 14.3 | 14.2 | 14.1 | 12.9 | 12.5 | 12.8 | 11.9 | 12.0 | 10.5 | 10.6 | 10.1 | 10.2 | 13.2 | 13.1 | 13.5 | 13.6 | 13.1 | 13.2 | 13.4 | 13.2 | 12.9 |
| Separators | 41.3 | 43.1 | 45.5 | 46.7 | 50.9 | 48.5 | 50.3 | 51.9 | 49.9 | 48.8 | 57.2 | 63.8 | 69.2 | 68.6 | 74.3 | 84.4 | 89.1 | 99.9 | 99.8 | 104.2 | 99.9 | 102.4 | 119.4 | 117.5 | 118.8 | 118.5 | 114.2 | 114.2 | 115.0 | 113.3 | 111.7 |
| Dehydrators | 12.8 | 13.7 | 14.1 | 14.1 | 13.9 | 14.6 | 14.5 | 14.2 | 13.3 | 13.0 | 13.0 | 12.2 | 11.7 | 10.2 | 9.3 | 8.9 | 7.3 | 6.6 | 4.4 | 4.2 | 3.4 | 3.2 | 5.5 | 5.5 | 5.9 | 5.9 | 5.6 | 5.8 | 5.9 | 5.8 | 5.6 |
| Meters/Piping | 42.6 | 44.5 | 47.0 | 48.6 | 50.4 | 51.4 | 53.7 | 54.8 | 52.6 | 51.1 | 54.6 | 57.0 | 58.4 | 55.0 | 56.1 | 60.2 | 59.5 | 63.6 | 60.1 | 61.7 | 58.6 | 59.8 | 72.9 | 72.0 | 73.6 | 73.8 | 71.2 | 71.5 | 72.2 | 71.2 | 69.9 |
| Compressors | 29.9 | 31.1 | 32.3 | 35.0 | 37.2 | 37.5 | 41.6 | 43.8 | 46.9 | 45.8 | 45.7 | 49.7 | 50.8 | 52.7 | 54.6 | 54.1 | 58.8 | 61.5 | 65.6 | 65.9 | 69.8 | 69.2 | 71.1 | 70.4 | 69.8 | 70.3 | 69.2 | 68.3 | 68.2 | 67.2 | 65.5 |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | 21.1 | 27.6 | 26.8 | 28.9 | 31.1 | 31.5 | 34.2 | 37.0 | 38.5 | 39.1 | 42.6 | 46.4 | 47.9 | 50.8 | 52.3 | 56.5 | 60.4 | 63.1 | 68.2 | 69.0 | 70.1 | 54.4 | 51.6 | 62.9 | 22.8 | 2.2 | 7.4 | 8.3 | 1.4 | 4.2 | 0.4 |
| HF Workovers - Non-REC with Flaring | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.8 | 0.9 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 3.3 | 0.3 | 0.3 | 0.4 | 0.1 | 0.1 | 0.5 | 1.0 | 0.6 | 0.1 |
| HF Workovers - REC with Venting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.7 | 0.9 | 1.1 | 1.3 | 1.5 | 1.7 | 0.5 | 2.4 | 0.5 | 8.7 | 5.9 | 15.1 | 17.1 | 9.0 | 6.6 |
| HF Workovers - REC with Flaring | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.1 | 0.3 | 0.03 | 0.2 | 1.6 | 1.2 | 4.6 | 0.04 | 0.1 |
| Non-HF Workovers - vented | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 1.8 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.4 | 0.4 | 0.3 |
| Non-HF Workovers - flared | 0.00 | 0.00 | 0.00 | 0.001 | 0.003 | 0.004 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.0001 | 0.01 | 0.002 | 0.03 | 0.003 | 0.0002 | 0.0004 | 0.002 | 0.0001 |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | 121.9 | 126.8 | 123.1 | 121.6 | 121.2 | 118.8 | 117.0 | 121.1 | 119.2 | 123.7 | 138.1 | 149.9 | 138.8 | 149.9 | 152.6 | 153.1 | 173.4 | 182.0 | 196.6 | 202.3 | 188.7 | 183.1 | 172.1 | 156.2 | 152.9 | 143.2 | 141.8 | 144.9 | 149.0 | 159.5 | 140.3 |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | 510.4 | 544.7 | 541.3 | 574.5 | 632.9 | 571.3 | 648.9 | 722.6 | 755.6 | 737.8 | 753.0 | 873.9 | 891.6 | 953.6 | 985.0 | 1,041.5 | 1,119.1 | 1,156.8 | 1,240.7 | 1,213.2 | 1,199.7 | 1,167.6 | 1,197.0 | 1,217.8 | 1,125.2 | 1,121.8 | 1,069.2 | 1,104.9 | 1,072.9 | 1,024.7 | 950.7 |
| (Low Bleed) | 0.0 | 0.0 | 0.0 | 0.7 | 1.6 | 2.2 | 3.4 | 4.9 | 6.3 | 7.4 | 8.8 | 11.9 | 14.0 | 17.0 | 19.8 | 23.6 | 28.3 | 32.6 | 38.9 | 42.1 | 46.1 | 49.7 | 42.7 | 28.5 | 33.3 | 33.2 | 32.8 | 36.1 | 35.1 | 33.1 | 32.7 |
| (High Bleed) | 308.9 | 329.7 | 327.6 | 343.1 | 373.5 | 331.2 | 369.9 | 404.7 | 415.1 | 397.8 | 396.2 | 448.6 | 445.5 | 462.6 | 462.5 | 471.5 | 486.5 | 480.3 | 488.9 | 450.2 | 415.2 | 372.0 | 319.4 | 284.2 | 194.0 | 106.2 | 107.8 | 113.1 | 92.9 | 72.3 | 43.1 |
| (Intermittent Bleed) | 201.4 | 215.0 | 213.6 | 230.7 | 258.8 | 238.0 | 275.6 | 313.1 | 334.2 | 333.4 | 348.0 | 413.4 | 432.1 | 474.0 | 502.7 | 546.4 | 604.3 | 643.9 | 712.9 | 720.8 | 738.4 | 745.9 | 834.9 | 1,005.1 | 957.8 | 982.3 | 928.4 | 955.7 | 944.9 | 918.7 | 875.4 |
| Chemical Injection Pumps | 27.2 | 27.9 | 28.0 | 31.1 | 36.2 | 32.1 | 38.7 | 44.9 | 49.3 | 48.7 | 50.8 | 61.9 | 65.1 | 72.3 | 77.2 | 84.6 | 94.3 | 100.8 | 112.6 | 114.2 | 118.1 | 119.5 | 119.9 | 118.8 | 117.1 | 118.3 | 116.7 | 116.1 | 115.1 | 113.5 | 110.8 |
| Kimray Pumps | 147.5 | 167.9 | 168.1 | 164.4 | 159.9 | 164.6 | 157.4 | 145.4 | 140.0 | 139.8 | 135.6 | 122.0 | 119.8 | 107.4 | 101.3 | 91.2 | 73.9 | 59.4 | 36.1 | 29.3 | 21.6 | 14.7 | 41.2 | 39.0 | 38.4 | 38.9 | 37.7 | 35.4 | 36.5 | 34.8 | 33.0 |
| Dehydrator Vents | 46.0 | 52.4 | 52.4 | 51.2 | 49.8 | 51.3 | 49.0 | 45.3 | 43.6 | 27.8 | 26.8 | 23.6 | 23.2 | 20.3 | 18.9 | 16.5 | 12.2 | 8.6 | 3.1 | 0.7 | 0.0 | 0.0 | 4.9 | 4.3 | 4.2 | 4.3 | 4.0 | 3.4 | 3.8 | 3.4 | 3.0 |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | 0.0 | 0.0 | 0.0 | 0.05 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.9 | 1.0 | 1.1 | 0.6 | 0.5 | 0.4 | 1.3 | 0.9 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | 0.0 | 0.0 | 0.0 | 9.14E-07 | 1.72E-06 | 2.49E-06 | 3.36E-06 | 4.44E-06 | 5.51E-06 | 6.41E-06 | 7.56E-06 | 9.00E-06 | 1.06E-05 | 1.21E-05 | 1.42E-05 | 1.67E-05 | 1.92E-05 | 2.28E-05 | 2.74E-05 | 2.89E-05 | 3.34E-05 | 4.19E-05 | 6.43E-05 | 8.71E-05 | 1.16E-04 | 1.50E-04 | 0.00E+00 | 1.07E-01 | 6.51E-02 | 8.94E-03 | 2.95E-02 |
| Misc. Onshore Production Flaring (430 - Permian Basin) | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.3 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.1 | 1.2 | 1.3 | 1.4 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.8 | 1.8 | 2.0 | 2.3 | 2.8 | 3.4 | 2.3 | 3.5 | 2.9 | 5.1 | 2.9 |
| Misc. Onshore Production Flaring (Other Basins) | 0.0 | 0.0 | 0.0 | 0.03 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.9 | 1.4 | 1.6 | 1.8 | 1.0 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.6 | 0.7 | 0.7 | 1.0 | 0.6 | 0.7 | 0.6 | 0.4 |
| Large Tanks w/VRU | 0.0 | 0.001 | 0.003 | 0.004 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.4 | 0.1 |
| Large Tanks w/o Control | 6.1 | 5.7 | 5.3 | 5.2 | 5.2 | 4.4 | 4.5 | 4.4 | 4.3 | 4.4 | 3.8 | 4.1 | 4.0 | 3.7 | 3.3 | 3.3 | 3.4 | 3.2 | 3.2 | 2.9 | 3.7 | 3.7 | 4.5 | 5.4 | 5.7 | 5.7 | 6.1 | 4.1 | 6.8 | 1.5 | 2.9 |
| Small Tanks w/Flares | 0.0 | 0.002 | 0.004 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Small Tanks w/o Flares | 10.1 | 9.6 | 9.0 | 9.1 | 9.3 | 8.0 | 8.4 | 8.4 | 8.4 | 8.7 | 7.8 | 8.5 | 8.5 | 8.1 | 7.6 | 7.8 | 8.4 | 8.2 | 8.5 | 8.2 | 10.9 | 11.5 | 14.2 | 17.0 | 17.8 | 18.0 | 22.6 | 16.1 | 16.8 | 18.6 | 13.6 |
| Malfunctioning Separator Dump Valves | 0.005 | 0.005 | 0.004 | 0.004 | 0.005 | 0.004 | 0.004 | 0.004 | 0.004 | 0.005 | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.1 | 0.4 | 0.02 | 0.1 | 0.2 |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | 115.7 | 120.3 | 125.4 | 126.1 | 132.2 | 129.6 | 131.9 | 135.8 | 142.2 | 140.7 | 148.2 | 158.8 | 166.2 | 178.2 | 182.3 | 198.0 | 212.6 | 221.3 | 236.7 | 239.7 | 232.0 | 234.8 | 233.5 | 229.1 | 224.6 | 220.1 | 214.7 | 197.2 | 207.1 | 202.1 | 197.1 |
| Well Clean Ups | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | 0.0 | 5.3 | 10.4 | 16.1 | 22.4 | 27.3 | 34.7 | 42.8 | 50.6 | 57.1 | 65.2 | 78.5 | 88.3 | 101.1 | 113.4 | 128.3 | 146.5 | 163.1 | 185.3 | 198.4 | 213.0 | 226.6 | 170.7 | 128.0 | 83.1 | 68.2 | 64.3 | 63.9 | 86.9 | 77.9 | 55.9 |
| Liquids Unloading without Plunger Lifts | 373.5 | 400.3 | 375.1 | 369.0 | 367.2 | 340.5 | 341.6 | 340.9 | 331.7 | 311.8 | 299.0 | 303.4 | 288.7 | 279.4 | 264.3 | 250.8 | 238.1 | 217.8 | 199.7 | 168.1 | 136.3 | 102.4 | 102.1 | 113.6 | 133.8 | 102.2 | 84.4 | 91.3 | 120.7 | 97.2 | 74.0 |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Compressor BD | 1.2 | 1.2 | 1.2 | 1.4 | 1.4 | 1.4 | 1.6 | 1.7 | 1.8 | 1.8 | 1.8 | 1.9 | 2.0 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.6 | 2.6 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.5 |
| Compressor Starts | 2.6 | 2.7 | 2.8 | 3.0 | 3.2 | 3.2 | 3.6 | 3.8 | 4.1 | 4.0 | 4.0 | 4.3 | 4.4 | 4.6 | 4.7 | 4.9 | 5.2 | 5.4 | 5.7 | 5.8 | 6.1 | 6.1 | 6.1 | 6.1 | 6.0 | 6.1 | 6.0 | 5.9 | 5.9 | 5.8 | 5.7 |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters Vent/Leak - Major Complexes | 134.6 | 139.9 | 136.8 | 139.8 | 140.1 | 143.9 | 142.4 | 147.3 | 142.5 | 134.2 | 142.4 | 140.6 | 140.3 | 136.5 | 136.1 | 43.2 | 131.7 | 118.6 | 107.5 | 101.6 | 40.5 | 34.4 | 29.9 | 23.2 | 16.8 | 13.7 | 20.8 | 16.5 | 16.7 | 15.8 | 18.0 |
| GOM Federal Waters Vent/Leak - Minor Complexes | 19.3 | 19.4 | 19.0 | 19.4 | 19.5 | 19.7 | 19.3 | 19.9 | 19.5 | 18.6 | 20.1 | 20.2 | 19.4 | 18.8 | 18.6 | 17.7 | 18.4 | 16.7 | 15.4 | 14.1 | 11.7 | 9.4 | 7.7 | 6.4 | 4.8 | 3.9 | 2.6 | 2.0 | 2.1 | 1.9 | 2.2 |
| GOM Federal Waters Flaring | 0.05 | 0.05 | 0.03 | 0.03 | 0.03 | 0.04 | 0.1 | 0.1 | 0.1 | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | 0.03 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.05 | 0.1 | 0.04 | 0.03 | 0.03 | 0.02 | 0.03 | 0.03 |
| GOM State Waters Vent/Leak | 14.2 | 13.0 | 17.2 | 19.8 | 27.2 | 26.1 | 27.6 | 30.6 | 29.1 | 26.1 | 25.9 | 27.5 | 28.5 | 25.4 | 23.3 | 10.7 | 29.7 | 25.6 | 29.7 | 24.3 | 11.2 | 10.5 | 13.0 | 11.2 | 8.9 | 5.7 | 8.1 | 7.3 | 11.3 | 11.9 | 18.3 |
| GOM State Waters Flaring | 0.004 | 0.004 | 0.004 | 0.004 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.03 |
| Alaska State Waters Vent/Leak | 1.9 | 2.0 | 2.2 | 2.1 | 2.0 | 2.1 | 2.4 | 2.3 | 2.5 | 2.4 | 2.3 | 2.3 | 2.0 | 1.7 | 1.5 | 1.5 | 1.2 | 1.0 | 0.9 | 0.9 | 0.8 | 0.7 | 0.7 | 0.5 | 0.4 | 0.3 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 |
| Alaska State Waters Flaring | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.005 | 0.004 | 0.003 | 0.003 | 0.000 | 0.002 | 0.001 | 0.001 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressors | 130.2 | 135.1 | 139.1 | 142.4 | 147.0 | 149.7 | 153.9 | 154.4 | 153.9 | 150.8 | 156.3 | 157.6 | 157.0 | 159.5 | 164.1 | 165.7 | 168.5 | 178.2 | 191.1 | 193.8 | 200.6 | 217.5 | 229.6 | 235.6 | 249.2 | 262.9 | 261.7 | 280.4 | 298.2 | 305.9 | 306.9 |
| Tanks | 129.8 | 134.8 | 138.7 | 142.1 | 146.6 | 149.3 | 153.5 | 154.0 | 153.5 | 150.4 | 155.9 | 157.2 | 156.6 | 159.1 | 163.6 | 165.2 | 168.1 | 177.7 | 190.6 | 193.3 | 200.0 | 216.9 | 229.0 | 235.0 | 248.5 | 262.2 | 261.0 | 255.2 | 249.5 | 300.2 | 244.3 |
| Station Blowdowns | 20.5 | 21.3 | 21.9 | 22.5 | 23.2 | 23.6 | 24.3 | 24.3 | 24.3 | 23.8 | 24.6 | 24.8 | 24.7 | 25.1 | 25.9 | 26.1 | 26.6 | 28.1 | 30.1 | 30.5 | 31.6 | 34.3 | 36.2 | 37.1 | 39.3 | 41.4 | 41.2 | 63.9 | 78.5 | 43.9 | 44.9 |
| Dehy Vents - Large units | 35.7 | 37.1 | 38.2 | 39.1 | 40.3 | 41.1 | 42.2 | 42.4 | 42.2 | 41.4 | 42.9 | 43.2 | 43.1 | 43.8 | 45.0 | 45.5 | 46.2 | 48.9 | 52.4 | 53.2 | 55.0 | 59.7 | 63.0 | 64.6 | 68.4 | 72.1 | 71.8 | 61.4 | 56.4 | 56.0 | 24.3 |
| Dehy Vents - Small units | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 |
| High-bleed Pneumatic Devices | 17.4 | 18.0 | 18.6 | 19.0 | 19.6 | 20.0 | 20.5 | 20.6 | 20.5 | 20.1 | 20.9 | 21.0 | 21.0 | 21.3 | 21.9 | 22.1 | 22.5 | 23.8 | 25.5 | 25.9 | 26.8 | 29.0 | 30.6 | 31.4 | 33.3 | 35.5 | 34.9 | 34.4 | 25.1 | 24.1 | 22.3 |
| Intermittent Bleed Pneumatic Devices | 79.7 | 82.8 | 85.2 | 87.2 | 90.0 | 91.7 | 94.2 | 94.6 | 94.2 | 92.3 | 95.7 | 96.5 | 96.2 | 97.7 | 100.5 | 101.5 | 103.2 | 109.1 | 117.0 | 118.7 | 122.8 | 133.2 | 140.6 | 144.3 | 152.6 | 161.0 | 160.4 | 191.5 | 173.8 | 181.9 | 172.4 |
| Low-Bleed Pneumatic Devices | 2.8 | 2.9 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.3 | 3.3 | 3.2 | 3.3 | 3.3 | 3.3 | 3.4 | 3.5 | 3.5 | 3.6 | 3.8 | 4.0 | 4.1 | 4.2 | 4.6 | 4.9 | 5.0 | 5.3 | 5.6 | 5.5 | 6.0 | 5.8 | 7.0 | 7.3 |
| Flare Stacks | 5.3 | 5.5 | 5.7 | 5.8 | 6.0 | 6.1 | 6.3 | 6.3 | 6.3 | 6.2 | 6.4 | 6.4 | 6.4 | 6.5 | 6.7 | 6.8 | 6.9 | 7.3 | 7.8 | 7.9 | 8.2 | 8.9 | 9.4 | 9.6 | 10.2 | 10.7 | 10.7 | 9.3 | 14.0 | 20.5 | 11.1 |
| AGRU | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Pneumatic Pumps | 16.0 | 16.6 | 17.1 | 17.5 | 18.0 | 18.4 | 18.9 | 19.0 | 18.9 | 18.5 | 19.2 | 19.3 | 19.3 | 19.6 | 20.1 | 20.3 | 20.7 | 21.9 | 23.5 | 23.8 | 24.6 | 26.7 | 28.2 | 28.9 | 30.6 | 32.3 | 32.1 | 23.5 | 25.6 | 26.8 | 27.2 |
| Combustion Slip | 172.3 | 178.9 | 184.1 | 188.5 | 194.5 | 198.1 | 203.7 | 204.4 | 203.7 | 199.5 | 206.9 | 208.6 | 207.8 | 211.1 | 217.1 | 219.3 | 223.0 | 235.8 | 252.9 | 256.5 | 265.4 | 287.9 | 303.9 | 311.8 | 329.8 | 348.0 | 346.3 | 371.4 | 395.0 | 405.6 | 407.1 |
| Dehydrator L&V | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.3 | 1.3 | 1.3 | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.7 | 1.9 | 1.9 | 2.1 | 0.7 |
| Yard Piping | 36.8 | 38.2 | 39.3 | 40.3 | 41.5 | 42.3 | 43.5 | 43.6 | 43.5 | 42.6 | 44.2 | 44.5 | 44.4 | 45.1 | 46.3 | 46.8 | 47.6 | 50.3 | 54.0 | 54.7 | 56.7 | 61.4 | 64.9 | 66.6 | 

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Station venting Trans + Storage*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Venting Transmission | 145.5 | 146.4 | 145.3 | 143.1 | 142.6 | 140.8 | 139.2 | 138.9 | 137.4 | 136.5 | 134.2 | 131.6 | 131.7 | 126.6 | 127.0 | 129.0 | 120.6 | 127.1 | 121.6 | 123.3 | 122.0 | 121.9 | 130.0 | 140.4 | 151.3 | 151.8 | 139.4 | 132.7 | 141.8 | 164.5 | 168.9 |
| Station Venting Storage | 30.3 | 31.5 | 32.4 | 32.1 | 31.8 | 31.6 | 31.3 | 31.0 | 30.7 | 30.4 | 30.2 | 29.9 | 29.6 | 29.3 | 29.0 | 28.8 | 29.0 | 28.8 | 29.4 | 29.4 | 29.5 | 29.7 | 29.7 | 29.9 | 29.9 | 29.3 | 29.1 | 29.0 | 28.8 | 29.0 | 28.9 |
| ***LNG Storage*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LNG Stations (eq. leaks, compressors, flares) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.4 | 0.6 | 1.4 |
| LNG Station Blowdowns | 6.6 | 6.7 | 6.8 | 6.9 | 7.0 | 7.1 | 7.3 | 7.4 | 7.5 | 7.6 | 7.7 | 7.8 | 7.9 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.1 | 8.2 | 8.2 | 8.2 | 8.2 | 7.9 | 8.0 | 8.1 | 8.2 | 8.4 |
| LNG Station Engine Exhaust | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.5 | 0.5 | 0.6 |
| LNG Station Turbine Exhaust | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.1 | 0.1 | 0.1 |
| ***LNG Import/Export Terminals*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LNG Import Terminals (eq. leaks, compressors, flares) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.5 | 0.5 | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.3 | 0.2 | 0.1 |
| LNG Import Terminal Blowdowns | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 3.7 | 3.7 | 4.9 | 4.9 | 6.1 | 6.1 | 6.1 | 9.8 | 11.1 | 13.5 | 14.8 | 14.8 | 13.5 | 13.5 | 13.5 | 13.5 | 13.5 | 13.1 | 0.3 | 0.2 |
| LNG Import Terminal Engine Exhaust | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.8 | 1.0 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 0.8 | 0.4 | 0.2 |
| LNG Import Terminal Turbine Exhaust | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 4.04E-06 | 6.06E-06 | 6.06E-06 | 8.08E-06 | 8.08E-06 | 1.01E-05 | 1.01E-05 | 1.01E-05 | 1.62E-05 | 1.82E-05 | 2.22E-05 | 2.42E-05 | 2.42E-05 | 2.22E-05 | 2.22E-05 | 2.22E-05 | 2.22E-05 | 2.22E-05 | 2.75E-05 | 2.46E-03 | 2.63E-03 |
| LNG Export Terminals (eq. leaks, compressors, flares) | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.3 | 1.0 | 1.4 | 2.7 | 4.0 |
| LNG Export Terminal Blowdowns | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 4.00E-05 | 0.1 | 0.0 | 0.01 | 0.1 | 0.3 |
| LNG Export Terminal Engine Exhaust | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.03 | 0.6 | 1.4 |
| LNG Export Terminal Turbine Exhaust | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.001 | 0.001 | 0.04 | 2.0 | 2.0 |
| **DISTRIBUTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Potential Emissions | 1,819.4 | 1,794.9 | 1,751.0 | 1,733.0 | 1,746.3 | 1,619.7 | 1,532.5 | 1,493.6 | 1,447.0 | 1,365.9 | 1,308.3 | 1,258.0 | 1,199.5 | 1,113.5 | 1,071.9 | 1,022.6 | 971.6 | 818.2 | 777.5 | 712.7 | 645.0 | 595.2 | 591.4 | 585.7 | 579.6 | 572.9 | 573.4 | 569.5 | 565.0 | 559.2 | 558.4 |
| Reductions (includes GasSTAR and MC) | 0.0 | 0.0 | 0.0 | 1.0 | 1.8 | 1.3 | 1.6 | 3.4 | 1.7 | 1.6 | 1.5 | 1.6 | 4.3 | 2.7 | 4.0 | 4.5 | 4.8 | 5.4 | 4.3 | 4.1 | 4.6 | 7.6 | 3.4 | 4.1 | 3.9 | 4.3 | 4.2 | 5.3 | 5.8 | 4.1 | 4.1 |
| **Net Emissions** | **1,819.4** | **1,794.9** | **1,751.0** | **1,732.1** | **1,744.5** | **1,618.5** | **1,531.0** | **1,490.2** | **1,445.3** | **1,364.3** | **1,306.7** | **1,256.3** | **1,195.2** | **1,110.7** | **1,068.0** | **1,018.1** | **966.8** | **812.8** | **773.3** | **708.5** | **640.3** | **587.5** | **588.0** | **581.6** | **575.7** | **568.7** | **569.2** | **564.2** | **559.2** | **555.1** | **554.3** |
| ***Pipeline Leaks*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mains - Cast Iron | 268.0 | 258.2 | 243.3 | 239.3 | 246.3 | 205.2 | 199.6 | 179.8 | 167.1 | 152.7 | 140.9 | 131.4 | 117.1 | 107.1 | 98.5 | 88.9 | 79.8 | 71.0 | 62.6 | 54.1 | 46.3 | 39.0 | 37.5 | 35.8 | 34.0 | 32.1 | 30.3 | 28.3 | 26.5 | 24.6 | 23.1 |
| Mains - Unprotected steel | 231.2 | 218.2 | 211.4 | 204.2 | 197.4 | 180.9 | 164.2 | 156.9 | 149.4 | 140.1 | 131.8 | 124.0 | 113.9 | 103.1 | 100.5 | 91.3 | 86.2 | 80.1 | 74.7 | 67.4 | 62.6 | 56.0 | 54.9 | 52.2 | 50.4 | 48.2 | 49.3 | 47.2 | 45.2 | 43.4 | 41.6 |
| Mains - Protected steel | 27.5 | 28.0 | 27.7 | 29.4 | 32.1 | 32.7 | 32.5 | 35.6 | 34.4 | 33.5 | 35.3 | 36.6 | 37.9 | 39.1 | 41.3 | 41.6 | 42.7 | 43.5 | 44.3 | 45.3 | 46.3 | 47.3 | 47.2 | 47.1 | 47.1 | 46.9 | 46.4 | 46.2 | 46.0 | 44.8 | 44.6 |
| Mains - Plastic | 59.4 | 48.8 | 51.0 | 53.5 | 58.0 | 58.5 | 55.0 | 61.8 | 56.0 | 54.5 | 55.1 | 56.9 | 56.2 | 49.1 | 48.1 | 44.8 | 41.7 | 37.9 | 33.3 | 28.8 | 23.8 | 18.7 | 19.1 | 19.5 | 19.9 | 20.4 | 20.8 | 21.3 | 21.8 | 22.3 | 22.7 |
| Services - Unprotected steel | 250.0 | 235.9 | 233.8 | 220.4 | 201.3 | 183.8 | 167.0 | 157.1 | 147.4 | 149.7 | 142.3 | 131.4 | 120.0 | 107.4 | 102.0 | 111.6 | 109.2 | 100.1 | 94.1 | 85.7 | 65.3 | 60.0 | 56.7 | 53.2 | 49.7 | 47.8 | 46.5 | 44.9 | 42.3 | 39.6 | 37.9 |
| Services Protected steel | 67.2 | 79.1 | 67.1 | 65.3 | 68.4 | 64.4 | 55.0 | 58.5 | 50.5 | 48.0 | 44.9 | 43.0 | 40.7 | 37.6 | 37.9 | 32.4 | 29.6 | 27.4 | 25.5 | 23.5 | 21.5 | 19.8 | 19.4 | 19.1 | 18.9 | 18.6 | 18.2 | 17.7 | 17.2 | 16.2 | 15.9 |
| Services - Plastic | 3.4 | 3.5 | 3.7 | 4.2 | 4.7 | 5.0 | 5.2 | 5.9 | 5.9 | 6.0 | 6.8 | 7.2 | 7.7 | 8.0 | 8.6 | 9.1 | 9.6 | 10.1 | 10.5 | 10.9 | 11.2 | 11.7 | 11.9 | 12.1 | 12.3 | 12.5 | 12.7 | 13.0 | 13.3 | 13.5 | 13.7 |
| Services - Copper | 7.8 | 8.0 | 7.7 | 7.9 | 7.7 | 7.1 | 7.4 | 7.7 | 7.2 | 7.1 | 7.0 | 6.8 | 6.7 | 6.7 | 7.0 | 6.1 | 6.1 | 6.0 | 5.6 | 5.3 | 5.3 | 5.2 | 4.9 | 4.8 | 4.6 | 4.4 | 4.2 | 3.9 | 3.6 | 3.4 | 3.2 |
| ***Meter/Regulator (City Gates)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M&R >300 | 140.6 | 141.8 | 139.6 | 139.4 | 142.6 | 131.9 | 123.9 | 119.1 | 116.7 | 105.5 | 98.9 | 93.5 | 88.2 | 78.6 | 72.3 | 64.9 | 57.9 | 31.6 | 26.7 | 20.2 | 14.4 | 9.0 | 9.0 | 9.2 | 9.0 | 8.4 | 8.6 | 8.7 | 8.8 | 8.9 | 8.9 |
| M&R 100-300 | 272.8 | 275.2 | 270.9 | 270.4 | 276.4 | 255.4 | 239.9 | 230.3 | 225.6 | 203.6 | 190.7 | 180.1 | 169.6 | 150.9 | 138.4 | 123.9 | 110.1 | 59.7 | 50.1 | 37.4 | 25.9 | 15.2 | 15.3 | 15.6 | 15.2 | 14.2 | 14.5 | 14.8 | 15.0 | 15.0 | 15.2 |
| M&R <100 | 6.6 | 6.6 | 6.5 | 6.9 | 7.4 | 7.2 | 7.2 | 7.4 | 7.7 | 7.5 | 7.6 | 7.8 | 8.1 | 8.0 | 8.2 | 8.3 | 8.6 | 5.6 | 5.8 | 5.6 | 5.6 | 5.9 | 6.0 | 6.1 | 5.9 | 5.6 | 5.7 | 5.8 | 5.9 | 5.9 | 5.9 |
| Reg >300 | 138.4 | 139.6 | 137.5 | 137.0 | 139.7 | 128.9 | 120.7 | 115.6 | 112.9 | 101.6 | 94.8 | 89.0 | 83.4 | 73.6 | 66.9 | 59.3 | 51.9 | 27.5 | 22.4 | 15.8 | 9.8 | 4.0 | 4.0 | 4.1 | 4.0 | 3.7 | 3.8 | 3.9 | 3.9 | 3.9 | 4.0 |
| R-Vault >300 | 0.7 | 0.7 | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Reg 100-300 | 104.7 | 105.7 | 104.0 | 103.6 | 105.6 | 97.3 | 91.1 | 87.2 | 85.0 | 76.4 | 71.2 | 66.7 | 62.4 | 54.9 | 49.8 | 43.9 | 38.2 | 20.1 | 16.1 | 11.1 | 6.5 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 |
| R-Vault 100-300 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 |
| Reg 40-100 | 8.1 | 8.1 | 8.0 | 8.4 | 9.0 | 8.8 | 8.7 | 8.9 | 9.3 | 9.0 | 9.1 | 9.3 | 9.6 | 9.4 | 9.6 | 9.8 | 10.0 | 6.5 | 6.7 | 6.5 | 6.5 | 6.8 | 6.8 | 7.0 | 6.8 | 6.4 | 6.5 | 6.6 | 6.7 | 6.7 | 6.8 |
| R-Vault 40-100 | 0.6 | 0.6 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.7 | 1.8 | 1.9 | 2.0 | 2.2 | 1.5 | 1.6 | 1.6 | 1.7 | 1.3 | 1.4 | 1.1 | 1.0 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Reg <40 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| ***Customer Meters*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | 58.4 | 59.8 | 60.6 | 61.2 | 62.3 | 63.5 | 64.7 | 65.8 | 67.1 | 68.3 | 69.5 | 70.7 | 71.8 | 72.7 | 73.5 | 75.0 | 75.6 | 76.6 | 76.9 | 77.2 | 77.4 | 77.9 | 78.4 | 78.9 | 79.4 | 80.3 | 80.8 | 81.6 | 82.4 | 83.2 | 84.5 |
| Commercial | 99.1 | 102.0 | 103.2 | 104.5 | 106.1 | 108.5 | 110.5 | 111.4 | 118.0 | 117.2 | 117.3 | 116.9 | 118.5 | 120.6 | 120.3 | 121.6 | 123.4 | 124.2 | 127.4 | 124.5 | 124.1 | 124.5 | 125.3 | 125.7 | 126.7 | 127.6 | 128.1 | 128.7 | 129.1 | 129.9 | 131.7 |
| Industrial | 22.9 | 22.7 | 22.0 | 22.0 | 21.3 | 22.0 | 21.6 | 24.7 | 23.8 | 24.0 | 23.1 | 22.8 | 21.6 | 21.6 | 22.0 | 21.7 | 20.4 | 20.8 | 23.6 | 21.8 | 20.2 | 19.9 | 19.9 | 20.2 | 20.2 | 19.8 | 19.8 | 19.4 | 19.4 | 19.3 | 19.3 |
| ***Routine Maintenance*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valve Releases | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 1.0 | 0.9 | 1.0 | 0.8 | 1.0 | 1.0 | 1.1 | 0.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.0 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 0.5 | 1.2 | 1.2 | 1.2 |
| Pipeline Blowdown | 3.0 | 3.1 | 3.0 | 2.2 | 1.6 | 2.1 | 1.8 | 0.0 | 2.1 | 1.9 | 2.0 | 2.0 | 0.6 | 1.0 | 0.2 | 0.0 | 0.0 | 1.0 | 1.0 | 1.4 | 1.1 | 2.0 | 2.2 | 2.1 | 2.4 | 2.0 | 2.3 | 2.0 | 0.8 | 2.1 | 2.1 |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mishaps (Dig-ins) | 47.4 | 47.8 | 47.0 | 49.4 | 53.3 | 52.1 | 51.9 | 53.1 | 55.6 | 54.0 | 54.7 | 56.3 | 58.1 | 57.3 | 58.6 | 59.5 | 61.1 | 59.7 | 62.4 | 62.4 | 62.8 | 59.5 | 64.1 | 63.9 | 64.4 | 65.1 | 65.5 | 66.7 | 67.2 | 67.9 | 68.6 |
| **OTHER** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **290.0** | **291.6** | **297.8** | **300.4** | **309.5** | **322.2** | **319.9** | **325.3** | **336.5** | **338.8** | **346.2** | **342.1** | **347.5** | **336.5** | **344.5** | **344.5** | **352.1** | **361.6** | **359.9** | **357.6** | **361.2** | **356.3** | **380.7** | **370.7** | **384.5** | **415.2** | **426.3** | **424.5** | **445.2** | **456.6** | **459.1** |
| ***Post-Meter*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | 142.8 | 141.9 | 142.6 | 142.7 | 146.2 | 149.4 | 148.2 | 150.2 | 156.8 | 160.4 | 161.9 | 165.7 | 165.1 | 164.0 | 167.4 | 169.8 | 173.7 | 173.6 | 173.2 | 174.2 | 164.4 | 155.0 | 158.4 | 155.5 | 166.8 | 181.4 | 186.2 | 189.5 | 188.6 | 190.5 | 192.2 |
| Commercial | 16.9 | 17.4 | 17.6 | 17.9 | 18.1 | 18.5 | 18.9 | 19.0 | 20.2 | 20.0 | 20.0 | 20.0 | 20.3 | 20.6 | 20.6 | 20.8 | 21.1 | 21.2 | 21.8 | 21.3 | 21.2 | 21.3 | 21.4 | 21.5 | 21.7 | 21.8 | 21.9 | 22.0 | 22.1 | 22.2 | 22.5 |
| Industrial & Power Plants | 130.3 | 132.3 | 137.6 | 139.8 | 145.2 | 154.3 | 152.8 | 156.1 | 159.5 | 158.3 | 164.2 | 156.4 | 162.1 | 151.9 | 156.5 | 153.8 | 157.3 | 166.8 | 164.9 | 162.1 | 175.6 | 180.0 | 200.9 | 193.7 | 196.0 | 211.9 | 218.1 | 212.9 | 234.5 | 243.8 | 244.3 |
| Natural Gas Vehicles | 1.76E-06 | 3.40E-04 | 6.77E-04 | 1.02E-03 | 1.35E-03 | 1.69E-03 | 2.03E-03 | 2.37E-03 | 2.70E-03 | 3.04E-03 | 3.92E-03 | 4.74E-03 | 5.77E-03 | 6.29E-03 | 6.71E-03 | 7.11E-03 | 7.23E-03 | 7.51E-03 | 8.09E-03 | 9.09E-03 | 9.21E-03 | 1.01E-02 | 1.14E-02 | 1.27E-02 | 1.51E-02 | 1.80E-02 | 2.10E-02 | 2.40E-02 | 2.67E-02 | 2.96E-02 | 3.23E-02 |

## Table 3.6-2: Average CH4 Emission Factors (kg/unit activity) for National Gas Systems Sources, for All Years

Average emission factors for each emission source in this table equal national emissions (from Table 3.6-1) divided by national activity data (from Table 3.6-7).

**Table Footnotes:**

"NA" indicates value not applicable

| Segment/Source | Units | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-completion well testing - vented | kg/event | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,261.8 | 5,561.0 | 728.8 | NA | NA | 1,010.0 | | |
| Non-completion well testing - flared | kg/event | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 1,714.6 | 225.5 | 150.6 | 8,264.6 | 35.5 | NA | | |
| HF Completions - Non-REC with Venting | kg/event | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 24,997.5 | 48,458.7 | 13,240.1 | 11,649.7 | 7,460.4 | 29,561.2 | 8,216.7 | 6,416.4 | 3,508.4 |
| HF Completions - Non-REC with Venting | kg/event | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 24,997.5 | 48,458.7 | 13,240.1 | 11,649.7 | 7,460.4 | 29,561.2 | 8,216.7 | 6,416.4 | 3,508.4 |
| HF Completions - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,451.1 | 3,418.0 | 1,786.2 | 5,075.6 | 6,253.0 | 12,715.3 | 9,433.8 | 7,142.1 | 3,147.0 |
| NH Completions - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,301.5 | 2,267.3 | 813.7 | 5,003.9 | 5,460.8 | 7,242.1 | 1,301.4 | 1,084.8 | 1,276.8 |
| Non-HF Completions - vented | kg/event | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 16,190.3 | 14,312.3 | 7,910.8 | 1,776.9 | 22,656.0 | 28,821.0 | 1,625.5 | 515.7 | 1,014.5 | 2,860.4 |
| Non-HF Completions - flared | kg/event | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,859.8 | 1,929.4 | 1,906.0 | 192.2 | 148.5 | 2,015.1 | 968.2 | 402.7 | 463.4 |
| Well Blowouts | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 60,000,000.0 | 26,900,000.0 | NA | | |
| Well Drilling | kg/well | 50.0 | 49.2 | 49.5 | 50.4 | 50.4 | 50.9 | 51.0 | 51.3 | 51.4 | 51.1 | 51.1 | 50.8 | 50.9 | 50.4 | 51.1 | 50.9 | 50.9 | 52.0 | 52.1 | 52.3 | 51.9 | 51.9 | 51.8 | 52.2 | 52.1 | 52.3 | 51.5 | 51.3 | 52.1 | 51.2 | |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wells) | kg/well | 93.2 | 93.8 | 98.7 | 99.0 | 101.3 | 100.1 | 99.5 | 97.8 | 96.9 | 98.0 | 100.1 | 98.0 | 98.2 | 97.0 | 98.0 | 98.4 | 97.6 | 98.1 | 96.9 | 97.0 | 96.1 | 96.2 | 96.3 | 95.7 | 96.3 | 95.8 | 95.1 | 94.0 | 94.7 | 95.0 | 96.1 |
| Gas Wells with Hydraulic Fracturing | kg/well | 109.1 | 99.5 | 107.8 | 107.5 | 107.7 | 111.0 | 109.1 | 108.1 | 109.2 | 109.2 | 113.0 | 118.4 | 125.1 | 126.9 | 130.5 | 131.4 | 133.6 | 139.2 | 137.7 | 137.5 | 134.4 | 134.5 | 133.0 | 131.6 | 131.5 | 130.2 | 131.0 | 130.0 | 129.4 | 129.2 | 130.0 |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | kg/heater | 254.2 | 259.6 | 271.3 | 274.7 | 276.9 | 286.1 | 284.9 | 277.1 | 263.9 | 254.9 | 265.0 | 253.8 | 253.9 | 228.1 | 227.3 | 230.9 | 212.9 | 220.7 | 186.9 | 191.6 | 174.7 | 175.6 | 227.1 | 226.8 | 237.5 | 236.5 | 230.9 | 234.2 | 239.5 | 239.3 | 240.5 |
| Separators | kg/separator | 363.2 | 333.4 | 361.0 | 355.9 | 365.7 | 359.7 | 347.2 | 333.0 | 306.6 | 299.0 | 337.0 | 336.9 | 350.1 | 324.4 | 332.2 | 353.6 | 343.7 | 363.1 | 334.6 | 342.9 | 322.1 | 325.7 | 378.5 | 370.6 | 385.0 | 382.7 | 372.2 | 374.0 | 379.7 | 379.5 | 383.3 |
| Dehydrators | kg/dehydrator | 471.4 | 451.3 | 473.1 | 482.0 | 488.3 | 497.6 | 511.7 | 515.4 | 495.6 | 483.4 | 492.2 | 493.3 | 489.1 | 447.0 | 432.1 | 439.4 | 396.6 | 395.8 | 302.7 | 310.1 | 249.3 | 247.2 | 454.2 | 437.4 | 455.4 | 454.2 | 437.4 | 451.6 | 464.3 | 462.7 | 463.4 |
| Meters/Piping | kg/meter | 233.1 | 237.2 | 250.1 | 248.2 | 247.3 | 255.1 | 246.3 | 235.0 | 218.4 | 212.0 | 225.0 | 213.9 | 215.8 | 193.2 | 193.6 | 198.5 | 185.7 | 193.7 | 170.1 | 179.8 | 159.8 | 161.0 | 195.9 | 195.3 | 202.4 | 200.9 | 196.5 | 198.4 | 202.1 | 201.9 | 203.2 |
| Compressors | kg/compressor | 1,748.3 | 1,784.4 | 1,858.9 | 1,894.0 | 1,929.0 | 1,992.4 | 1,997.5 | 1,988.2 | 1,894.2 | 1,987.3 | 1,985.6 | 1,973.0 | 1,972.7 | 1,943.7 | 1,969.5 | 1,868.1 | 1,925.5 | 1,978.4 | 1,966.4 | 1,958.6 | 1,975.5 | 1,942.0 | 1,988.8 | 1,988.0 | 1,999.8 | 1,993.8 | 1,990.2 | 1,973.6 | 1,986.1 | 1,984.5 | 1,982.6 |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | kg/event | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 44,554.6 | 24,997.5 | 48,458.7 | 13,240.1 | 11,649.7 | 7,460.4 | 29,561.2 | 8,216.7 | 6,416.4 | 3,508.4 |
| HF Workovers - Non-REC with Flaring | kg/event | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,677.8 | 5,702.2 | 5,677.8 | 565.5 | 2,018.7 | 4,084.7 | 2,430.4 | 1,831.3 | | |
| HF Workovers - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,028.8 | 4,451.1 | 3,410.9 | 1,786.2 | 5,075.6 | 6,253.0 | 12,715.3 | 9,433.8 | 7,142.1 | 3,147.0 |
| HF Workovers - REC with Flaring | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,967.7 | 2,301.5 | 2,267.3 | 813.7 | 5,003.9 | 5,460.8 | 7,242.1 | 1,301.4 | 1,084.8 | 1,276.8 |
| Non-HF Workovers - vented | kg/event | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 88.6 | 190.5 | 56.5 | 62.3 | 72.2 | 73.0 | 85.7 | 51.6 | 52.8 | 32.3 |
| Non-HF Workovers - flared | kg/event | NA | NA | NA | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 500.0 | 1.1 | 73.4 | 2.3 | 73.5 | 8.1 | 0.7 | 0.7 | 9.9 | 0.8 | |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | kg/MMbbl produced water | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,802.9 | 50,572.9 | 50,591.0 | 50,574.1 | 50,590.9 | 50,594.7 | 50,595.3 | 50,602.8 | 50,518.9 | 50,539.9 | 50,547.2 | 50,529.0 | 50,520.6 | 50,502.6 | 50,472.3 | 50,465.1 | 50,442.6 | 50,438.8 | 50,446.8 | 50,456.5 | 50,479.1 | 50,435.1 |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | kg/controller | 2,527.3 | 2,527.3 | 2,527.3 | 2,464.1 | 2,400.9 | 2,337.7 | 2,274.5 | 2,211.3 | 2,148.1 | 2,084.9 | 2,021.7 | 1,958.5 | 1,895.3 | 1,832.1 | 1,768.9 | 1,705.7 | 1,642.4 | 1,579.2 | 1,516.0 | 1,452.8 | 1,389.6 | 1,326.4 | 1,355.6 | 1,392.2 | 1,304.9 | 1,287.7 | 1,282.3 | 1,255.1 | 1,254.5 | 1,247.7 | 1,217.5 | |
| (Low Bleed) | kg/controller | NA | NA | NA | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | 160.6 | |
| (High Bleed) | kg/controller | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | 4,370.7 | |
| (Intermittent Bleed) | kg/controller | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | 1,534.7 | |
| Chemical Injection Pumps | kg/pump | 1,743.4 | 1,743.4 | 1,743.4 | 1,731.7 | 1,720.0 | 1,708.3 | 1,696.6 | 1,684.9 | 1,673.2 | 1,661.5 | 1,649.8 | 1,638.1 | 1,626.4 | 1,614.7 | 1,603.0 | 1,591.3 | 1,579.6 | 1,568.0 | 1,556.3 | 1,544.6 | 1,532.9 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | 1,521.2 | |
| Kimray Pumps | kg/MMscf | 18.6 | 18.9 | 19.1 | 19.1 | 19.2 | 19.2 | 18.9 | 18.1 | 17.8 | 17.8 | 17.6 | 16.9 | 17.1 | 16.1 | 16.0 | 15.4 | 13.7 | 12.1 | 8.4 | 7.1 | 5.4 | 9.8 | 10.7 | 10.2 | 10.2 | 10.0 | 9.5 | 9.8 | 9.5 | 9.2 | |
| Dehydrator Vents | kg/MMscf | 5.2 | 5.3 | 5.4 | 5.3 | 5.3 | 5.3 | 5.3 | 5.0 | 4.9 | 3.2 | 3.1 | 2.9 | 2.9 | 2.7 | 2.7 | 2.5 | 2.0 | 1.6 | 0.7 | 0.2 | 0.0 | 0.0 | 1.1 | 1.0 | 1.0 | 1.0 | 0.8 | 0.9 | 0.8 | 0.7 | |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin (LA TX)) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0.03 | 0.04 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.1 | 0.4 | 0.3 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0.00001 | 0.00002 | 0.00003 | 0.0000 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0 | 0.15 | 0.07 | 0.01 | 0.03 |
| Misc. Onshore Production Flaring (430 - Permian Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 | 1.1 | 1.2 | 1.2 | 1.3 | 1.4 | 1.4 | 0.9 | 1.1 | 0.7 | 0.9 | 0.5 |
| Misc. Onshore Production Flaring (Other Basins) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0.003 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.03 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | kg/bbl | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.005 | 0.004 | 0.003 |
| Large Tanks w/VRU | kg/bbl | NA | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.006 | 0.005 | 0.011 | 0.003 |
| Large Tanks w/o Control | kg/bbl | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.3 |
| Small Tanks w/Flares | kg/bbl | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.004 |
| Small Tanks w/o Flares | kg/bbl | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.8 | 0.8 | 0.6 | 0.8 | 1.1 | 0.5 |
| Malfunctioning Separator Dump Valves | kg/bbl | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0004 | 0.0028 | 0.0001 | 0.0001 | 0.0001 |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | kg/MMHPhr | 4,323.7 | 4,395.9 | 4,567.7 | 4,525.5 | 4,579.2 | 4,589.6 | 4,590.4 | 4,604.2 | 4,680.1 | 4,589.2 | 4,587.2 | 4,585.4 | 4,571.6 | 4,649.8 | 4,665.0 | 4,571.6 | 4,571.0 | 4,455.1 | 4,498.9 | 4,448.0 | 4,292.2 | 4,291.9 | 4,301.6 | 4,302.0 | 4,265.8 | 4,216.8 | 4,216.2 | 4,196.1 | 4,193.8 | 4,166.4 | 4,150.7 | |
| ***Well Clean Ups*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | kg/well | NA | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 4,710.9 | 3,794.0 | 3,129.5 | 2,019.5 | 1,477.5 | 1,665.7 | 2,188.6 | 2,407.4 | 2,274.7 | 1,518.6 | |
| Liquids Unloading without Plunger Lifts | kg/well | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,416.9 | 3,098.0 | 1,788.7 | 1,283.3 | 1,405.0 | 1,383.0 | 4,845.4 | 4,335.1 | 4,106.7 |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | kg/vessel | 1.5 | 1.5 | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.5 | 1.6 | 1.6 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| Compressor BD | kg/compressor | 67.5 | 68.9 | 71.8 | 73.1 | 74.5 | 75.8 | 77.1 | 76.7 | 77.0 | 76.7 | 76.7 | 76.2 | 76.2 | 75.1 | 76.1 | 75.9 | 75.6 | 77.0 | 77.1 | 76.8 | 76.6 | 76.9 | 76.9 | 76.7 | 77.3 | 77.1 | 76.9 | 76.3 | 76.8 | 76.7 | 76.6 | |
| Compressor Starts | kg/compressor | 151.0 | 154.2 | 160.6 | 163.6 | 166.6 | 169.5 | 172.6 | 171.6 | 172.3 | 171.7 | 171.5 | 170.4 | 170.4 | 167.9 | 170.2 | 169.7 | 169.1 | 172.2 | 172.4 | 171.7 | 171.5 | 172.1 | 171.9 | 171.7 | 172.9 | 172.4 | 172.0 | 170.6 | 171.7 | 171.6 | 171.4 | |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | kg/PRV | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters Vent/Leak - Major Complexes | kg/complex | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 88,814.1 | 261,907.1 | 261,907.1 | 261,907.1 | 261,907.1 | 123,279.7 | 123,279.7 | 123,279.7 | 115,631.0 | 115,631.0 | 115,631.0 | 191,761.8 | 191,761.8 | 191,761.8 | 191,761.8 | |
| GOM Federal Waters Vent/Leak - Minor Complexes | kg/complex | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 35,022.4 | 25,129.2 | 25,129.2 | 25,129.2 | 25,129.2 | 25,129.2 |
| GOM Federal Waters Flaring | kg/MMBtu (of flared gas) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| GOM State Waters Vent/Leak | kg/MMcf | 53.2 | 59.9 | 58.2 | 61.3 | 63.5 | 65.9 | 65.5 | 70.2 | 71.0 | 72.0 | 76.1 | 78.0 | 86.0 | 79.2 | 85.3 | 44.6 | 126.1 | 111.5 | 116.4 | 111.2 | 58.4 | 61.3 | 73.7 | 73.8 | 70.1 | 53.2 | 78.5 | 84.8 | 84.8 | 84.8 | 84.8 |
| GOM State Waters Flaring | kg/MMcf | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.4 |
| Alaska State Waters Vent/Leak | kg/MMcf | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 19.7 | 34.5 | 25.4 | 29.5 | 35.2 | 30.5 |
| Alaska State Waters Flaring | kg/MMcf | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.004 | 0.1 | 0.1 | 0.1 | 0.1 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressors | kg/compressor | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 | 16,118.4 |
| Tanks | kg/tank | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 | 5,606.4 |
| Station Blowdowns | kg/event | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 | 122.4 |
| Dehy Vents - Large units | kg/dehydrator | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,297.1 | 24,292.0 | 18,927.2 | 16,777.7 | 15,899.1 | 24,325.3 | |
| Dehy Vents - Small units | kg/dehydrator | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,185.2 | 1,317.8 | 1,212.9 | 1,281.6 | 1,249.9 |
| High-Bleed Pneumatic Devices | kg/device | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 5,031.2 | 4,890.8 | 5,113.4 | 5,092.8 | 5,113.4 | 5,092.8 | 5,089.5 |
| Intermittent Bleed Pneumatic Devices | kg/device | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,565.2 | 1,566.1 | 1,718.0 | 1,727.8 | 1,754.8 | 1,721.0 | |
| Low-Bleed Pneumatic Devices | kg/device | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 177.8 | 169.0 | 174.3 | 179.2 | 177.7 |
| Flare Stacks | kg/flare | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2,592.0 | 2

Table 3.6-3: U.S. Production Sector CH4 Content in Natural Gas by NEMS Region (General Sources)

| Year | North East | Midcontinent | Rocky Mountain | South West | West Coast | Gulf Coast | Lower 48 States |
|---|---|---|---|---|---|---|---|
| 1990 | 84.0% | 78.3% | 67.0% | 64.4% | 75 3% | 79.8% | n/a |
| 1991 | 83.8% | 78.7% | 69.1% | 67.1% | 78.1% | 80.1% | n/a |
| 1992 | 83.5% | 79.1% | 71.4% | 75.4% | 80 8% | 82.7% | n/a |
| 1993 | 82.9% | 79.9% | 73.4% | 76.1% | 83.6% | 84.1% | n/a |
| 1994 | 82.0% | 80.7% | 75.5% | 77.4% | 86.4% | 85.6% | n/a |
| 1995 | 81.5% | 81.6% | 77.6% | 79.0% | 89.1% | 87.2% | n/a |
| 1996 | 81.2% | 82.6% | 80.5% | 80.5% | 91 9% | 88.7% | 84 2% |
| 1997 | 80.3% | 82.5% | 80.4% | 80.5% | 91 9% | 88.6% | 84.1% |
| 1998 | 81.0% | 82.5% | 80.5% | 80.5% | 91 9% | 88.6% | 84 2% |
| 1999 | 80.5% | 82.5% | 80.4% | 80.5% | 91 9% | 88.7% | 84 2% |
| 2000 | 80.8% | 82.5% | 80.2% | 80.5% | 91 9% | 88.7% | 84 0% |
| 2001 | 80.3% | 82.5% | 79.5% | 80.5% | 91 9% | 88.7% | 83 8% |
| 2002 | 80.4% | 82.5% | 79.3% | 80.5% | 91 9% | 88.6% | 83 5% |
| 2003 | 76.4% | 82.6% | 79.1% | 80.5% | 91 9% | 88.6% | 83 2% |
| 2004 | 80.4% | 82.7% | 79.0% | 80.5% | 91 9% | 88.6% | 83.4% |
| 2005 | 80.1% | 82.7% | 79.0% | 80.5% | 91 9% | 88.6% | 83.4% |
| 2006 | 79.5% | 83.0% | 78.9% | 80.5% | 91 9% | 88.6% | 83.4% |
| 2007 | 85.8% | 82.7% | 77.5% | 80.5% | 91 9% | 88.6% | 83 9% |
| 2008 | 86.0% | 82.7% | 77.7% | 80.5% | 91 9% | 88.5% | 83 9% |
| 2009 | 85.1% | 82.7% | 77.5% | 80.5% | 91 9% | 88.5% | 83.6% |
| 2010 | 84.3% | 82.8% | 77.4% | 80.5% | 91 9% | 88.3% | 83.4% |
| 2011 | 85.2% | 82.6% | 77.5% | 80.5% | 91 9% | 88.2% | 83 3% |
| 2012 | 84.8% | 82.5% | 78.2% | 80.5% | 91 9% | 88.2% | 83 0% |
| 2013 | 84.2% | 82.5% | 77.9% | 80.5% | 91 9% | 88.9% | 82 9% |
| 2014 | 86.0% | 82.5% | 77.6% | 80.5% | 91 9% | 88.9% | 82 3% |
| 2015 | 85.3% | 82.4% | 77.6% | 80.5% | 91 9% | 88.9% | 82 2% |
| 2016 | 85.3% | 82.4% | 76.4% | 80.5% | 91 9% | 88.9% | 81.6% |
| 2017 | 83.3% | 82.9% | 76.4% | 80.5% | 91 9% | 89.0% | 81.6% |
| 2018 | 84.5% | 82.7% | 77.0% | 80.5% | 91 9% | 88.9% | 82.4% |
| 2019 | 84.3% | 82.6% | 77.1% | 80.5% | 91 9% | 88.9% | 82 5% |
| 2020 | 84.3% | 82.6% | 77.1% | 80.5% | 91 9% | 88.9% | 82 5% |

Table 3.6-4: U.S. Production Sector CH4 Content in Natural Gas by NEMS Region (Gas Wells Without Hydraulic Fracturing)

| Year | North East | Midcontinent | Rocky Mountain | South West | West Coast | Gulf Coast | Lower 48 States |
|---|---|---|---|---|---|---|---|
| 1990 | 84.0% | 78.3% | 67.0% | 64.4% | 75.3% | 79 8% | n/a |
| 1991 | 83.8% | 78.7% | 69.1% | 67.1% | 78.1% | 80.1% | n/a |
| 1992 | 83.5% | 79.1% | 71.4% | 75.4% | 80.8% | 82.7% | n/a |
| 1993 | 82.9% | 79.9% | 73.4% | 76.1% | 83.6% | 84.1% | n/a |
| 1994 | 82.0% | 80.7% | 75.5% | 77.4% | 86.4% | 85.6% | n/a |
| 1995 | 81.5% | 81.6% | 77.6% | 79.0% | 89.1% | 87 2% | n/a |
| 1996 | 81.2% | 82.5% | 79.6% | 80.5% | 91.9% | 88.6% | 84 0% |
| 1997 | 80.5% | 82.5% | 79.5% | 80.5% | 91.9% | 88.6% | 83 9% |
| 1998 | 81.2% | 82.5% | 79.5% | 80.5% | 91.9% | 88.6% | 84 0% |
| 1999 | 80.7% | 82.5% | 79.5% | 80.5% | 91.9% | 88.7% | 83 9% |
| 2000 | 81.0% | 82.5% | 79.2% | 80.5% | 91.9% | 88.7% | 83 8% |
| 2001 | 80.4% | 82.5% | 78.3% | 80.5% | 91.9% | 88.6% | 83 5% |
| 2002 | 80.5% | 82.5% | 78.1% | 80.5% | 91.9% | 88.6% | 83 2% |
| 2003 | 76.5% | 82.6% | 77.9% | 80.5% | 91.9% | 88.6% | 82 9% |
| 2004 | 80.5% | 82.6% | 77.8% | 80.5% | 91.9% | 88.6% | 83.1% |
| 2005 | 80.3% | 82.7% | 77.7% | 80.5% | 91.9% | 88.6% | 83.1% |
| 2006 | 79.6% | 83.0% | 77.7% | 80.5% | 91.9% | 88.6% | 83.1% |
| 2007 | 85.6% | 82.7% | 75.8% | 80.5% | 91.9% | 88.6% | 83 5% |
| 2008 | 85.6% | 82.7% | 76.0% | 80.5% | 91.9% | 88 5% | 83 5% |
| 2009 | 84.7% | 82.7% | 75.8% | 80.5% | 91.9% | 88 5% | 83.1% |
| 2010 | 83.8% | 82.8% | 75.6% | 80.5% | 91.9% | 88 3% | 82 9% |
| 2011 | 85.0% | 82.6% | 75.8% | 80.5% | 91.9% | 88 2% | 82 8% |
| 2012 | 84.4% | 82.5% | 76.7% | 80.5% | 91.9% | 88 2% | 82 5% |
| 2013 | 83.9% | 82.5% | 76.3% | 80.5% | 91.9% | 88 9% | 82.4% |
| 2014 | 85.6% | 82.4% | 76.0% | 80.5% | 91.9% | 88 9% | 81.7% |
| 2015 | 85.1% | 82.3% | 76.1% | 80.5% | 91.9% | 88 9% | 81.6% |
| 2016 | 85.0% | 82.4% | 74.5% | 80.5% | 91.9% | 88 9% | 80 8% |
| 2017 | 82.7% | 82.9% | 74.5% | 80.5% | 91.9% | 89 0% | 80 8% |
| 2018 | 84.1% | 82.7% | 75.3% | 80.5% | 91.9% | 88 9% | 81 8% |
| 2019 | 83.9% | 82.6% | 75.4% | 80.5% | 91.9% | 88 9% | 81 9% |
| 2020 | 83.7% | 82.7% | 75.4% | 80.5% | 91.9% | 89 0% | 81 9% |

Table 3.6-5: U.S. Production Sector CH4 Content in Natural Gas by NEMS Region (Gas Wells With Hydraulic Fracturing)

| Year | North East | Midcontinent | Rocky Mountain | South West | West Coast | Gulf Coast | Lower 48 States |
|---|---|---|---|---|---|---|---|
| 1990 | 84 0% | 78.3% | 67.0% | 64.4% | 75.3% | 79.8% | n/a |
| 1991 | 83 8% | 78.7% | 69.1% | 67.1% | 78.1% | 80.1% | n/a |
| 1992 | 83 5% | 79.1% | 71.4% | 75.4% | 80.8% | 82.7% | n/a |
| 1993 | 82 9% | 79.9% | 73.4% | 76.1% | 83.6% | 84.1% | n/a |
| 1994 | 82 0% | 80.7% | 75.5% | 77.4% | 86.4% | 85.6% | n/a |
| 1995 | 81 5% | 81.6% | 77.6% | 79 0% | 89.1% | 87.2% | n/a |
| 1996 | 83 2% | 92.6% | 74.4% | 80 5% | 91.9% | 88.7% | 82.1% |
| 1997 | 83.1% | 92.6% | 74.9% | 80 5% | 91.9% | 88.6% | 82.1% |
| 1998 | 83.1% | 92.6% | 75.5% | 80 5% | 91.9% | 88.6% | 82 3% |
| 1999 | 83.1% | 92.6% | 75.3% | 80 5% | 91.9% | 88.7% | 81 9% |
| 2000 | 83 0% | 92.6% | 76.4% | 80 5% | 91.9% | 88.7% | 82 5% |
| 2001 | 83 0% | 92.6% | 78.9% | 80 5% | 91.9% | 88.7% | 83.6% |
| 2002 | 83 0% | 92.6% | 80.5% | 80 5% | 91.9% | 88.6% | 84.4% |
| 2003 | 83.1% | 92.6% | 81.4% | 80 5% | 91.9% | 88.6% | 84 9% |
| 2004 | 83 0% | 92.6% | 81.7% | 80 5% | 91.9% | 88.6% | 85 2% |
| 2005 | 83 0% | 92.6% | 82.0% | 80 5% | 91.9% | 88.6% | 85 3% |
| 2006 | 83 0% | 92.6% | 82.6% | 80 5% | 91.9% | 88.6% | 85.7% |
| 2007 | 83 5% | 92.6% | 86.5% | 80 5% | 91.9% | 88.6% | 88.7% |
| 2008 | 84.1% | 92.6% | 86.3% | 80 5% | 91.9% | 88.5% | 88.4% |
| 2009 | 84.1% | 92.6% | 86.8% | 80 5% | 91.9% | 88.5% | 88.7% |
| 2010 | 84 3% | 92.6% | 86.8% | 80 5% | 91.9% | 88.3% | 89.1% |
| 2011 | 83.6% | 92.6% | 87.9% | 80 5% | 91.9% | 88.2% | 89.4% |
| 2012 | 84 0% | 92.6% | 87.6% | 80 5% | 91.9% | 88.2% | 89.1% |
| 2013 | 83 9% | 92.6% | 88.1% | 80 5% | 91.9% | 88.9% | 89 3% |
| 2014 | 84 0% | 92.6% | 88.8% | 80 5% | 91.9% | 88.9% | 90 0% |
| 2015 | 83.1% | 92.6% | 89.4% | 80 5% | 91.9% | 88.9% | 90 3% |
| 2016 | 84 0% | 92.6% | 91.1% | 80 5% | 91.9% | 88.9% | 91 5% |
| 2017 | 84 2% | 92.6% | 91.2% | 80 5% | 91.9% | 89.0% | 91 3% |
| 2018 | 84.1% | 92.6% | 89.9% | 80 5% | 91.9% | 88.9% | 90 3% |
| 2019 | 84.1% | 92.6% | 90.4% | 80 5% | 91.9% | 88.9% | 90.7% |
| 2020 | 84 3% | 92.6% | 90.4% | 80 5% | 91.9% | 89.0% | 90 8% |

| Table 3.6-6: CH4 Emission Factors for Natural Gas Systems, Data Sources/Methodology | | |
|---|---|---|
| **Segment/Source** | **Units** | **Data Source(s)/Methodology** |
| **EXPLORATION** | | |
| Non-completion well testing - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Non-completion well testing - flared | kg/event | |
| HF Completions - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Completions - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Completions - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Completions - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| Non-HF Completions - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Non-HF Completions - flared | kg/event | |
| Well Blowouts | n/a | Added MT/event in each year anomalous blowouts were noted. See EPA 2021e for additional detail. |
| Well Drilling | kg/well | Radian/API 1992 |
| **PRODUCTION** | | |
| **Gas Wells** | | |
| Total Producing Gas Wells | kg/well | n/a |
| Non-associated Gas Wells (less fractured wells) | kg/well | GRI/EPA 1996 |
| Gas Wells with Hydraulic Fracturing | kg/well | GRI/EPA 1996 |
| **Well Pad Equipment** | | |
| Heaters | kg/heater | GRI/EPA 1996 |
| Separators | kg/separator | GRI/EPA 1996 |
| Dehydrators | kg/dehydrator | GRI/EPA 1996 |
| Meters/Piping | kg/meter | GRI/EPA 1996 |
| Compressors | kg/compressor | GRI/EPA 1996 |
| **Well Workovers** | | |
| HF Workovers - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Workovers - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Workovers - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| HF Workovers - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2013 and EPA 2018b for additional detail. |
| Non-HF Workovers - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Non-HF Workovers - flared | kg/event | |
| **Normal Operations** | | |
| Pneumatic Device Vents | kg/controller | Calculated weighted average of bleed type emission factors. |
| Pneumatic Device Vents - Low Bleed (LB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category. Refer to EPA 2016a for additional detail. |
| Pneumatic Device Vents - High Bleed (HB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category. Refer to EPA 2016a for additional detail. |
| Pneumatic Device Vents - Intermittent Bleed (IB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category. Refer to EPA 2016a for additional detail. |
| Chemical Injection Pumps | kg/pump | Calculated using RY2014 GHGRP subpart W data. Refer to EPA 2016a for additional detail. |
| Kimray Pumps | kg/MMscf | GRI/EPA 1996 |
| Dehydrator Vents | kg/MMscf | GRI/EPA 1996 |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | kg/MMscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b for additional detail. |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/MMscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b for additional detail. |
| Misc. Onshore Production Flaring (430 - Permian Basin) | kg/MMscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b for additional detail. |
| Misc. Onshore Production Flaring (Other Basins) | kg/MMscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b for additional detail. |
| **Condensate Tank Vents** | | |
| Large Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for |
| Large Tanks w/VRU | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for additional detail. |
| Large Tanks w/o Control | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for additional detail. |
| Small Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for additional detail. |
| Small Tanks w/o Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for additional detail. |
| Malfunctioning Separator Dump Valves | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017a for additional detail. |
| **Compressor Exhaust Vented** | | |
| Gas Engines | kg/MMHPhr | GRI/EPA 1996 |
| **Well Clean Ups** | | |
| Liquids Unloading with Plunger Lifts | kg/venting well | 2011-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2010: Year 2011 emission factors. Refer to EPA 2018b for additional detail. |
| Liquids Unloading without Plunger Lifts | kg/venting well | 2011-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2010: Year 2011 emission factors. Refer to EPA 2018b for additional detail. |
| **Blowdowns** | | |
| Vessel Blowdowns | kg/vessel | GRI/EPA 1996 |
| Compressor Blowdowns | kg/compressor | GRI/EPA 1996 |
| Compressor Starts | kg/compressor | GRI/EPA 1996 |
| **Upsets** | | |
| Pressure Relief Valves | kg/PRV | GRI/EPA 1996 |
| **Produced Water** | | |
| Natural Gas Wells | kg/MMbbl produced water | EPA 2017d. Refer to EPA 2021b for additional details. |
| **Offshore** | | |
| GOM Federal Waters (All sources, except flares) | kg/complex | 1990-2004, 2006-2009: Calculated from year 2008 BOEM data (BOEM 2008). 2005: Calculated from year 2005 BOEM data (BOEM 2005). 2010-2012: Calculated from year 2011 BOEM data (BOEM 2011). 2013-2015: Calculated from year 2014 BOEM data (BOEM 2014). 2016 forward: Calculated from year 2017 BOEM data (BOEM 2017). Refer to EPA 2020a for detail. |
| GOM Federal Waters Flaring | kg/MMBtu (of flared gas) | Calculated from flaring volumes reported in OGOR-B reports (BOEM 2021d). Refer to EPA 2020a for detail. |
| GOM State Waters (All sources, except flares) | kg/MMcf | Equals GOM federal waters emissions divided by GOM federal waters gas production from gas wells (BOEM 2021b, BOEM 2021c), calculated for each year. Refer to EPA 2020a for detail. |
| GOM State Waters Flaring | kg/MMcf | Equals GOM federal waters emissions divided by GOM federal waters gas production from gas wells (BOEM 2021b, BOEM 2021c), calculated for each year. Refer to EPA 2020a for detail. |
| Alaska State Waters (All sources, except flares) | kg/MMcf | 2015 forward: Calculated using year-specific GHGRP subpart W and subpart C data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2020a for detail. |
| Alaska State Waters Flaring | kg/MMcf | 2015 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2020a for detail. |
| **Gathering and Boosting** | | |
| G&B Stations | | |
| Compressors | kg/compressor | Zimmerle 2019. Refer to EPA 2020b for detail. |

| | | |
|---|---|---|
| Tanks | kg/tank | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Station Blowdowns | kg/event | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Dehy Vents - Large units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Dehy Vents - Small units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| High-bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Intermittent Bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Low-Bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Flare Stacks | kg/flare | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| AGRU | kg/AGRU | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Pneumatic Pumps | kg/pump | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Combustion Slip | kg/unit | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Dehydrator L&V | kg/dehydrator | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Yard Piping | kg/station | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Separators | kg/separator | Zimmerle 2019. Refer to EPA 2020b for detail. |
| Desiccant Dehydrators | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| G&B Pipeline Leaks | kg/mile | 2016-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2019a for additional detail. |
| G&B Pipeline Blowdowns | kg/mile | 2016-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2019a for additional detail. |
| **GAS PROCESSING PLANTS** | | |
| Plant Grouped Emission Sources | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Plant Fugitives | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Reciprocating Compressors | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Centrifugal Compressors (wet seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Centrifugal Compressors (dry seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Flares | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Dehydrators | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). For centrifugal compressors with dry seals, dry seal emissions are not included in subpart W; dry seal emissions are added using information from EPA 2006. 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| Compressor Exhaust | | |
| Gas Engines | kg/MMHPhr | GRI/EPA 1996 |
| Gas Turbines | kg/MMHPhr | GRI/EPA 1996 |
| AGR Vents | kg/AGR unit | GRI/EPA 1996 |
| Pneumatic Devices | kg/plant | GRI/EPA 1996 |
| Blowdowns/Venting | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: Emission factors from GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2017b for additional detail. |
| **TRANSMISSION AND STORAGE** | | |
| Pipeline Leaks | kg/mile | GRI/EPA 1996 |
| ***Compressor Stations (Transmission)*** | | |
| Station + Compressor Fugitive Emissions | kg/station | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Reciprocating Compressor | kg/compressor | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (total) | kg/compressor | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (wet seals) | kg/compressor | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (dry seals) | kg/compressor | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| ***Compressor Stations (Storage)*** | | |
| Station + Compressor Fugitive Emissions | kg/station | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Reciprocating Compressor | kg/compressor | 2011-2020: Calculated using Zimmerle et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016c for additional detail. |
| Wells (Storage) | kg/well | GRI/EPA 1996. Note, total emissions estimate for years 2015 and 2016 are supplemented by data from the Aliso Canyon leak (EPA 2017c). |
| M&R (Trans. Co. Interconnect) | kg/station | GRI/EPA 1996 |
| M&R (Farm Taps + Direct Sales) | kg/station | GRI/EPA 1996 |
| ***Normal Operation*** | | |
| Dehydrator vents (Transmission) | kg/MMscf | GRI/EPA 1996 |
| Dehydrator vents (Storage) | kg/MMscf | GRI/EPA 1996 |
| Flaring (Transmission) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Flaring (Storage) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| ***Compressor Exhaust*** | | |
| Engines (Transmission) | kg/MMHPhr | GRI/EPA 1996 |
| Turbines (Transmission) | kg/MMHPhr | GRI/EPA 1996 |
| Engines (Storage) | kg/MMHPhr | GRI/EPA 1996 |
| Turbines (Storage) | kg/MMHPhr | GRI/EPA 1996 |
| Generators (Engines) | kg/MMHPhr | GRI/EPA 1996 |
| Generators (Turbines) | kg/MMHPhr | GRI/EPA 1996 |
| ***Pneumatic Devices Trans + Stor*** | | |
| Pneumatic Devices Transmission | kg/device | 1990-1992: GRI/EPA 1996. 2011-2020: Calculated weighted average of bleed type emission factors. 1993-2010: Linear interpolation. |
| (High Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |
| (Intermittent Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |

| | | |
|---|---|---|
| (Low Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |
| Pneumatic Devices Storage | kg/device | 1990-1992: GRI/EPA 1996. 2011-2020: Calculated weighted average of bleed type emission factors. 1993-2010: Linear interpolation. |
| (High Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |
| (Intermittent Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |
| (Low Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2016c for additional detail. |
| ***Routine Maintenance/Upsets*** | | |
| Pipeline venting | kg/mile | 1990-2015: GRI/EPA 1996. 2016-2020: Calculated using year-specific GHGRP subpart W RY2016-2020 data (EPA 2021c). Refer to EPA 2019c for additional detail. |
| ***Station venting Trans + Storage*** | | |
| Station Venting Transmission | kg/station | GRI/EPA 1996 |
| Station Venting Storage | kg/station | GRI/EPA 1996 |
| **LNG Storage** | | |
| LNG Stations (eq. leaks, compressors, flares) | kg/facility | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Station Blowdowns | kg/facility | GRI/EPA 1996 |
| LNG Station Engine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| LNG Station Turbine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| **LNG Import/Export Terminals** | | |
| LNG Import Terminals (eq. leaks, compressors, flares) | kg/terminal | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Blowdowns | kg/terminal | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Engine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| LNG Import Terminal Turbine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| LNG Export Terminals (eq. leaks, compressors, flares) | kg/terminal | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Blowdowns | kg/terminal | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Engine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| LNG Export Terminal Turbine Exhaust | kg/MMHPhr | GRI/EPA 1996 |
| **DISTRIBUTION** | | |
| ***Pipeline Leaks*** | | |
| Mains - Cast Iron | kg/mile | 2011-2020: Calculated using data from Lamb et al. 2015 and GRI/EPA 1996. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Mains - Unprotected steel | kg/mile | 2011-2020: Calculated using data from Lamb et al. 2015 and GRI/EPA 1996. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Mains - Protected steel | kg/mile | 2011-2020: Calculated using data from Lamb et al. 2015 and GRI/EPA 1996. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Mains - Plastic | kg/mile | 2011-2020: Calculated using data from Lamb et al. 2015 and GRI/EPA 1996. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Total Pipeline Miles | kg/mile | n/a |
| Services - Unprotected steel | kg/service | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Services Protected steel | kg/service | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Services - Plastic | kg/service | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Services - Copper | kg/service | GRI/EPA 1996 |
| Total Services | kg/service | n/a |
| ***Meter/Regulator (City Gates)*** | | |
| M&R >300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| M&R 100-300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| M&R <100 | kg/station | GRI/EPA 1996. Refer to EPA 2016d for additional detail. |
| Reg >300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| R-Vault >300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Reg 100-300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| R-Vault 100-300 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Reg 40-100 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| R-Vault 40-100 | kg/station | 2011-2020: Calculated using data from Lamb et al. 2015. 1990-1992: GRI/EPA 1996. 1993-2010: Linear interpolation. Refer to EPA 2016d for additional detail. |
| Reg <40 | kg/station | GRI/EPA 1996. Refer to EPA 2016d for additional detail. |
| ***Customer Meters*** | | |
| Residential | kg/outdoor meter | Calculated using data from GRI/EPA 1996, GTI 2009, and Clearstone 2011. Refer to EPA 2021a for additional detail. |
| Commercial | kg/meter | Calculated using data from GTI 2009 and GTI 2019. Refer to EPA 2021a for additional details. |
| Industrial | kg/meter | Calculated using data from GTI 2009 and GTI 2019. Refer to EPA 2021a for additional details. |
| ***Rountine Maintenance*** | | |
| Pressure Relief Valve Releases | kg/mile main | GRI/EPA 1996 |
| Pipeline Blowdown | kg/mile | GRI/EPA 1996 |
| ***Upsets*** | | |
| Mishaps (Dig-ins) | kg/mile | GRI/EPA 1996 |
| **POST-METER** | | |
| Residential | kg/NG house | CH4 EF is from the Fischer study (Fischer et al. 2018). To avoid double-counting of emissions, CH4 emissions from residential natural gas fuel combustion source are deducted from the residenial post-meter estimates. |
| Commercial | kg/appliance | IPCC 2019 |
| Industrial & EGUs | kg/BCF | IPCC 2019 |
| Natural Gas Vehicles | kg/vehicle | IPCC 2019 |

**Table 3.6-7: Activity Data for Natural Gas Systems Sources, for All Years**

**Table Footnotes:**

"NA" indicates value not estimated

| Segment/Source | Units | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-completion well testing - vented | events | 187 | 208 | 205 | 211 | 221 | 216 | 228 | 241 | 260 | 251 | 258 | 262 | 291 | 307 | 320 | 308 | 361 | 379 | 406 | 412 | 421 | 424 | 427 | 423 | 417 | 422 | 401 | 130 | 0 | 0 | 1 |
| Non-completion well testing - flared | events | 13 | 14 | 14 | 15 | 15 | 15 | 16 | 17 | 17 | 17 | 18 | 20 | 21 | 22 | 23 | 22 | 26 | 27 | 29 | 29 | 30 | 30 | 30 | 29 | 29 | 29 | 28 | 10 | 0 | 0 | 650 |
| HF Completions - Non-REC with Venting | events | 2 662 | 2 650 | 1 758 | 2 216 | 2 333 | 2 117 | 2 663 | 3 671 | 3 131 | 3 578 | 4 885 | 6 413 | 5 022 | 5 904 | 6 558 | 7 650 | 8 841 | 8 308 | 8 678 | 4 775 | 4 599 | 8 263 | 2 605 | 1 388 | 2 060 | 337 | 161 | 103 | 146 | 164 | 16 |
| HF Completions - Non-REC with Flaring | events | 274 | 272 | 195 | 251 | 248 | 235 | 274 | 386 | 348 | 398 | 543 | 763 | 608 | 736 | 873 | 1 043 | 1 247 | 1 299 | 1 660 | 845 | 870 | 1 151 | 882 | 671 | 646 | 326 | 138 | 163 | 152 | 159 | 39 |
| HF Completions - REC with Venting | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 199 | 336 | 162 | 935 | 1 397 | 2 004 | 2 435 | 3 086 | 2 036 | 2 329 | 2 698 | 2 186 | 2 918 | 1 526 | 3 107 | 2 010 | 2 961 | 3 072 | 2 504 |
| HF Completions - REC with Flaring | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 77 | 126 | 230 | 363 | 542 | 778 | 946 | 1 198 | 790 | 904 | 1 047 | 1 677 | 1 900 | 2 775 | 1 751 | 807 | 781 | 1 220 | 941 |
| Non-HF Completions - vented | events | 314 | 306 | 169 | 420 | 418 | 428 | 431 | 457 | 473 | 475 | 488 | 519 | 532 | 582 | 626 | 660 | 685 | 737 | 770 | 781 | 787 | 827 | 772 | 801 | 808 | 624 | 285 | 481 | 578 | 790 | 770 |
| Non-HF Completions - flared | events | 11 | 10 | 12 | 12 | 13 | 13 | 15 | 16 | 16 | 15 | 16 | 17 | 18 | 18 | 19 | 21 | 22 | 23 | 24 | 24 | 25 | 27 | 25 | 26 | 27 | 20 | 9 | 15 | 526 | 326 | 326 |
| Non-Fliteboards | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Non-Drilling | wells | 15 549 | 8 736 | 11 520 | 8 498 | 8 011 | 6 762 | 17 186 | 10 931 | 9 353 | 10 866 | 14 248 | 16 712 | 13 936 | 16 774 | 20 068 | 22 501 | 26 479 | 25 397 | 24 291 | 11 716 | 12 296 | 9 517 | 5 687 | 5 050 | 4 725 | 2 596 | 1 897 | 3 090 | 18 475 | 16 642 | 16 642 |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Gas Wells** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Active Gas Wells | wells | 194 344 | 217 197 | 212 956 | 228 109 | 224 062 | 227 355 | 250 929 | 259 167 | 260 390 | 267 479 | 292 715 | 302 058 | 313 165 | 332 088 | 351 129 | 375 617 | 393 449 | 422 262 | 428 418 | 427 816 | 437 091 | 432 689 | 444 075 | 439 351 | 443 645 | 438 181 | 432 983 | 429 912 | 426 470 | 432 268 |
| Non-associated Gas Wells (less fractured wells) | wells | 141 654 | 148 515 | 146 262 | 147 431 | 151 908 | 145 626 | 152 145 | 158 671 | 163 426 | 162 976 | 161 480 | 174 790 | 177 973 | 184 844 | 191 191 | 191 206 | 205 616 | 212 107 | 221 582 | 220 643 | 221 092 | 220 607 | 238 068 | 214 241 | 208 768 | 209 269 | 205 028 | 202 858 | 198 753 | 193 320 | 186 707 |
| Gas Wells with Hydraulic Fracturing | wells | 52 690 | 68 682 | 66 732 | 71 918 | 72 415 | 78 617 | 85 220 | 92 288 | 96 511 | 97 164 | 106 199 | 117 821 | 124 185 | 134 321 | 141 354 | 155 923 | 170 211 | 181 562 | 200 770 | 207 776 | 215 998 | 212 092 | 236 006 | 225 670 | 224 877 | 228 832 | 227 093 | 227 619 | 227 163 | 226 028 |
| **Well Pad Equipment** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | heaters | 48 047 | 49 138 | 49 396 | 52 356 | 51 358 | 50 816 | 52 967 | 54 465 | 55 283 | 54 985 | 53 996 | 56 018 | 55 556 | 56 368 | 55 221 | 55 585 | 55 760 | 56 419 | 56 127 | 55 439 | 57 313 | 57 950 | 58 171 | 57 825 | 56 808 | 57 288 | 56 600 | 56 521 | 55 852 | 55 074 | 52 739 |
| Separators | separators | 113 620 | 129 430 | 126 077 | 131 261 | 139 132 | 138 752 | 144 887 | 151 686 | 162 643 | 163 140 | 169 603 | 188 013 | 197 516 | 211 678 | 223 573 | 228 768 | 259 263 | 276 191 | 288 227 | 302 827 | 09 338 | 314 616 | 331 427 | 312 421 | 308 019 | 311 184 | 306 909 | 305 396 | 302 810 | 298 633 | 291 398 |
| Dehydrators | dehydrators | 27 091 | 30 306 | 29 646 | 29 167 | 28 105 | 28 625 | 27 842 | 28 491 | 29 332 | 26 819 | 26 633 | 28 104 | 28 109 | 28 542 | 28 504 | 28 727 | 28 740 | 28 742 | 28 757 | 28 268 | 28 872 | 28 787 | 14 642 | 13 580 | 13 146 | 13 167 | 13 064 | 12 878 | 12 650 | 12 861 | 12 748 |
| Meters/Piping | meters | 182 994 | 87 498 | 187 929 | 195 825 | 203 968 | 203 560 | 218 005 | 233 104 | 240 716 | 240 831 | 242 509 | 266 402 | 270 426 | 284 711 | 289 417 | 303 294 | 320 615 | 328 262 | 353 197 | 354 675 | 66 720 | 371 156 | 372 308 | 368 820 | 363 565 | 367 355 | 362 255 | 360 869 | 357 467 | 352 693 | 343 947 |
| Compressors | compressors | 17 227 | 17 240 | 17 388 | 18 455 | 18 306 | 18 335 | 20 918 | 22 961 | 23 915 | 23 915 | 23 0 0 | 23 025 | 25 196 | 25 772 | 27 123 | 27 722 | 28 935 | 30 536 | 31 065 | 31 065 | 33 347 | 35 353 | 35 353 | 36 753 | 35 324 | 35 324 | 36 799 | 36 924 | 36 924 | 38 324 | 38 324 |
| **Well Workovers** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | events | 674 | 630 | 649 | 669 | 706 | 767 | 850 | 865 | 877 | 936 | 1 041 | 1 025 | 1 160 | 1 175 | 1 269 | 1 354 | 1 417 | 1 435 | 1 501 | 1 598 | 1 572 | 1 220 | 2 065 | 1 288 | 1 723 | 187 | 986 | 279 | 136 | 658 | 110 |
| HF Workovers - Non-REC with Flaring | events | 53 | 49 | 67 | 72 | 78 | 78 | 85 | 92 | 96 | 97 | 106 | 118 | 129 | 134 | 141 | 156 | 170 | 182 | 201 | 208 | 236 | 580 | 69 | 138 | 202 | 62 | 123 | 168 | 216 | 252 | 18 |
| HF Workovers - REC with Venting | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 42 | 64 | 96 | 133 | 173 | 216 | 274 | 318 | 368 | 616 | 183 | 715 | 295 | 1 721 | 910 | 1 191 | 1 8 4 | 1 262 | 2 093 |
| HF Workovers - REC with Flaring | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 8 | 12 | 18 | 25 | 32 | 41 | 51 | 60 | 68 | 116 | 34 | 135 | 55 | 325 | 172 | 225 | 34 | 238 | 395 |
| Non-HF Workovers - vented | events | 6 162 | 6 060 | 6 362 | 6 419 | 6 603 | 6 627 | 6 667 | 6 883 | 7 091 | 7 049 | 7 001 | 7 575 | 7 705 | 8 004 | 8 273 | 8 681 | 8 883 | 9 149 | 9 574 | 9 530 | 9 545 | 9 525 | 8 354 | 9 214 | 8 242 | 8 703 | 8 582 | 8 551 | 8 028 | 8 217 | 8 022 |
| Non-HF Workovers - flared | events | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Produced Water* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | MMBbls produced water | 2 399 | 2 497 | 2 423 | 2 394 | 2 386 | 2 318 | 2 305 | 2 384 | 2 347 | 2 6 | 2 721 | 2 563 | 2 745 | 2 962 | 2 962 | 3 017 | 3 035 | 3 427 | 3 620 | 3 890 | 4 001 | 3 735 | 3 624 | 3 608 | 3 895 | 3 029 | 2 840 | 2 810 | 2 873 | 2 914 | 3 160 |
| **Normal Operations** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | controllers | 202 931 | 215 528 | 214 166 | 218 192 | 262 608 | 244 604 | 285 291 | 326 780 | 311 753 | 352 862 | 372 428 | 446 238 | 470 452 | 520 529 | 556 810 | 610 424 | 681 360 | 732 511 | 818 361 | 835 076 | 863 195 | 880 373 | 699 277 | 882 013 | 874 737 | 862 274 | 875 134 | 833 815 | 872 342 | 855 246 |
| (Low Bleed) | controllers | 0 | 0 | 0 | 4 309 | 4 764 | 13 551 | 21 090 | 30 193 | 39 055 | 51 073 | 74 224 | 86 448 | 105 825 | 123 560 | 146 751 | 176 830 | 205 076 | 243 999 | 292 375 | 267 208 | 303 116 | 316 665 | 337 181 | 266 954 | 277 729 | 207 569 | 206 753 | 204 368 | 224 761 | 224 128 | 226 050 |
| (High Bleed) | controllers | 55 427 | 75 458 | 75 458 | 81 767 | 83 533 | 83 533 | 86 648 | 92 385 | 94 972 | 96 107 | 102 641 | 102 641 | 101 538 | 101 538 | 105 387 | 107 881 | 111 355 | 109 952 | 112 483 | 113 252 | 109 952 | 112 483 | 113 252 | 86 117 | 76 446 | 42 109 | 39 648 | 33 010 | 21 260 | 21 260 | 14 585 |
| (Intermittent Bleed) | controllers | 131 218 | 140 693 | 139 208 | 150 340 | 368 630 | 155 087 | 179 562 | 203 961 | 217 755 | 257 256 | 276 764 | 269 571 | 281 594 | 308 896 | 327 169 | 356 020 | 393 757 | 439 945 | 464 301 | 469 687 | 481 132 | 486 044 | 543 979 | 464 870 | 524 066 | 640 073 | 606 964 | 622 701 | 615 652 | 598 582 | 532 890 |
| Chemical Injection Pumps | active pumps | 15 578 | 15 931 | 16 061 | 17 931 | 21 159 | 18 703 | 22 822 | 26 961 | 27 427 | 29 280 | 30 654 | 27 795 | 29 033 | 34 792 | 38 191 | 39 683 | 59 683 | 46 734 | 72 193 | 74 914 | 77 960 | 78 365 | 78 365 | 77 771 | 76 706 | 76 328 | 75 650 | 72 973 | 72 973 | 72 973 | 72 973 |
| Kimray Pumps | MMscf | 7 930 182 | 8 871 835 | 8 691 632 | 8 588 557 | 8 843 288 | 8 575 228 | 8 219 825 | 8 038 225 | 7 856 214 | 7 856 669 | 7 701 353 | 7 209 298 | 7 025 736 | 6 656 752 | 6 3 8 2 5 7 | 5 929 266 | 5 578 742 | 6 933 557 | 4 398 556 | 4 126 215 | 3 974 497 | 3 837 870 | 3 800 828 | 3 823 616 | 3 769 176 | 3 837 950 | 3 735 597 | 3 737 075 | 3 705 918 | 3 664 389 | 3 581 793 |
| Dehydrator Vents | MMscf | 8 960 566 | 9 956 575 | 9 734 512 | 9 606 942 | 9 842 968 | 9 542 215 | 9 197 102 | 9 033 267 | 8 823 338 | 8 824 466 | 8 643 403 | 8 093 195 | 7 865 221 | 7 475 755 | 7 086 308 | 6 643 621 | 6 256 779 | 7 744 148 | 4 913 264 | 4 611 424 | 4 440 744 | 4 288 417 | 4 247 966 | 4 280 275 | 4 220 172 | 4 178 714 | 4 183 196 | 4 182 275 | 4 144 627 | 4 100 211 | 4 003 013 |
| Misc. Onshore Production Flaring (200 - Gulf Coast Basin [LA-TX]) | MMscf | 3 058 717 | 3 082 437 | 3 123 567 | 3 233 425 | 3 223 666 | 3 332 112 | 3 506 691 | 3 451 517 | 3 660 810 | 3 372 870 | 3 928 896 | 3 471 647 | 3 231 439 | 3 117 864 | 3 055 724 | 2 909 575 | 2 848 033 | 2 796 565 | 2 664 190 | 2 335 269 | 2 102 688 | 2 190 899 | 2 068 843 | 2 002 328 | 2 015 339 | 3 387 791 | 3 003 717 | 2 830 912 | 2 966 694 | 3 046 365 | 2 685 132 |
| Misc. Onshore Production Flaring (300 - W Texas Basin) | MMscf | 85 335 | 85 168 | 84 936 | 89 998 | 84 779 | 81 815 | 82 756 | 87 491 | 90 353 | 90 126 | 93 029 | 98 454 | 104 108 | 108 030 | 1 6 128 | 126 663 | 134 780 | 149 432 | 168 388 | 167 836 | 82 696 | 216 933 | 336 475 | 608 297 | 521 064 | 641 868 | 657 656 | 722 399 | 901 226 | 1 118 628 | 1 033 667 |
| Misc. Onshore Production Flaring (400 - Permian Basin) | MMscf | 1 916 664 | 1 996 130 | 1 948 648 | 1 917 056 | 1 863 765 | 1 883 055 | 1 948 081 | 1 951 626 | 1 948 388 | 1 894 980 | 1 928 901 | 1 950 993 | 1 899 243 | 1 895 080 | 1 927 052 | 1 696 42 | 1 720 787 | 1 739 780 | 1 742 452 | 1 691 396 | 1 612 160 | 1 557 314 | 1 625 855 | 1 766 017 | 2 069 734 | 2 372 872 | 2 576 884 | 2 879 905 | 3 166 352 | 3 669 839 | 4 008 252 |
| Misc. Onshore Production Flaring (Other Basins) | MMscf | 0 167 166 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Condensate Tank Vents** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | bbl | 30 287 824 | 33 628 692 | 32 611 267 | 34 116 265 | 35 652 656 | 31 903 283 | 34 431 440 | 35 651 262 | 36 891 991 | 39 596 785 | 36 568 267 | 41 103 693 | 42 302 665 | 41 912 093 | 30 602 361 | 43 086 252 | 48 152 067 | 48 606 291 | 52 453 763 | 52 128 510 | 71 904 894 | 79 068 222 | 96 956 478 | 116 564 222 | 121 923 811 | 123 172 178 | 107 264 500 | 100 020 849 | 120 127 288 | 153 973 959 | 153 903 692 |
| Large Tanks w/Rec | bbl | 0 | 0 | 0 | 0 | 1 326 545 | 3 842 968 | 2 925 281 | 3 025 196 | 3 025 196 | 3 025 196 | 4 202 858 | 4 252 955 | 5 141 957 | 5 303 530 | 6 059 795 | 6 245 911 | 6 256 779 | 6 933 557 | 8 728 429 | 9 831 262 | 8 728 429 | 9 831 262 | 8 728 429 | 9 831 262 | 8 728 429 | 9 831 262 | 8 728 429 | 9 831 262 | 8 728 429 | 9 831 262 | 8 728 429 |
| Large Tanks w/o Control | bbl | 30 287 824 | 33 067 130 | 29 594 173 | 29 418 433 | 29 267 852 | 24 874 140 | 25 669 283 | 24 990 376 | 26 473 862 | 26 805 595 | 23 631 219 | 22 501 153 | 22 417 852 | 20 085 360 | 18 606 578 | 18 684 243 | 19 258 257 | 17 985 193 | 17 423 306 | 6 435 991 | 20 660 703 | 20 633 474 | 21 320 155 | 30 457 220 | 21 818 989 | 32 146 780 | 32 265 253 | 25 917 076 | 39 777 480 | 26 334 439 | 32 822 568 |
| Small Tanks | bbl | 0 | 561 562 | 1 017 094 | 4 697 832 | 5 385 111 | 3 186 175 | 6 836 876 | 7 635 690 | 7 392 933 | 9 771 590 | 8 733 190 | 16 349 387 | 14 743 156 | 16 523 203 | 5 936 988 | 18 476 326 | 22 637 561 | 23 687 905 | 25 301 751 | 36 256 819 | 42 750 823 | 49 774 354 | 65 966 802 | 76 705 629 | 91 376 778 | 75 284 910 | 58 989 971 | 73 330 560 | 87 617 973 | 117 414 051 | 100 744 253 |
| Small Tanks w/o Flares | bbl | 20 378 609 | 19 361 862 | 18 153 675 | 18 380 186 | 18 589 588 | 16 098 757 | 16 316 087 | 16 837 266 | 16 868 993 | 17 304 502 | 15 643 767 | 17 016 399 | 17 537 811 | 16 227 125 | 15 197 607 | 15 588 483 | 16 505 018 | 16 418 017 | 17 112 336 | 6 683 261 | 21 862 336 | 22 196 179 | 28 643 388 | 33 180 695 | 35 767 865 | 36 134 089 | 29 271 760 | 25 636 832 | 21 298 298 | 17 511 730 | 25 913 164 |
| Malfunctioning Separator Dump Valves | bbl | 68 573 248 | 66 126 132 | 63 064 737 | 64 955 574 | 66 738 611 | 58 778 784 | 62 452 458 | 63 677 056 | 64 955 574 | 68 573 248 | 62 452 458 | 68 187 527 | 71 024 946 | 68 573 248 | 65 313 853 | 68 573 248 | 75 932 596 | 75 310 217 | 80 208 509 | 78 933 951 | 107 348 835 | 116 333 033 | 142 463 008 | 171 938 121 | 179 397 798 | 161 236 585 | 161 526 756 | 136 414 606 | 187 572 927 | 213 822 411 | 188 293 976 |
| **Compressor Exhaust Vented** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | MMHPhr | 26 762 | 27 367 | 27 660 | 27 856 | 28 238 | 28 728 | 29 686 | 30 093 | 30 660 | 32 216 | 34 623 | 36 356 | 38 326 | 40 837 | 43 312 | 46 516 | 48 837 | 52 929 | 53 887 | 54 008 | 54 686 | 56 278 | 53 252 | 51 664 | 52 185 | 50 986 | 50 105 | 49 175 | 48 696 | 47 681 | |
| **Well Clean Ups** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | venting wells | 0 | 1 125 | 2 204 | 3 808 | 4 749 | 5 795 | 7 367 | 9 086 | 10 741 | 12 123 | 13 847 | 16 656 | 18 750 | 21 663 | 26 079 | 27 245 | 31 089 | 34 619 | 39 326 | 42 107 | 45 221 | 48 091 | 46 989 | 40 950 | 41 114 | 46 121 | 39 576 | 29 182 | 36 086 | 34 268 | 36 791 |
| Liquids Unloading without Plunger Lifts | venting wells | 109 319 | 117 144 | 109 772 | 102 997 | 107 475 | 99 648 | 99 961 | 93 757 | 97 064 | 91 252 | 87 699 | 88 786 | 84 502 | 81 768 | 77 347 | 71 419 | 69 682 | 63 753 | 58 466 | 49 192 | 39 888 | 29 968 | 33 313 | 36 603 | 33 210 | 31 125 | 24 161 | 26 967 | 24 9 3 | 22 331 | 18 010 |
| **Blowdowns** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel Blowdowns | vessels | 188 762 | 208 867 | 205 168 | 210 993 | 214 885 | 214 815 | 226 278 | 237 370 | 243 668 | 244 983 | 249 982 | 270 062 | 277 199 | 290 169 | 300 291 | 314 925 | 333 658 | 346 282 | 368 006 | 373 363 | 81 331 | 385 587 | 386 795 | 383 160 | 377 705 | 381 582 | 376 360 | 374 684 | 371 366 | 366 158 | 352 320 |
| Compressor Blowdowns | compressors | 17 227 | 17 240 | 17 388 | 18 455 | 18 306 | 18 114 | 20 808 | 22 961 | 23 915 | 23 915 | 23 0 0 | 23 025 | 25 196 | 25 772 | 27 123 | 27 722 | 28 935 | 30 536 | 31 065 | 31 065 | 33 347 | 35 353 | 35 353 | 36 753 | 35 324 | 35 324 | 36 799 | 36 924 | 36 924 | 38 324 | 38 324 |
| Compressor Starts | compressors | 17 227 | 17 240 | 17 388 | 18 455 | 18 306 | 18 114 | 20 808 | 22 961 | 23 915 | 23 915 | 23 0 0 | 23 025 | 25 196 | 25 772 | 27 123 | 27 722 | 28 935 | 30 536 | 31 065 | 31 065 | 33 347 | 35 353 | 35 353 | 36 753 | 35 324 | 35 324 | 36 799 | 36 924 | 34 3 8 | 33 960 | 33 039 |
| **Upsets** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | PRV | 683 082 | 580 285 | 529 440 | 531 833 | 570 529 | 556 916 | 590 019 | 623 750 | 643 122 | 647 252 | 665 225 | 727 603 | 750 827 | 792 350 | 826 668 | 872 803 | 933 667 | 978 545 | 1 049 862 | 1 064 919 | 1 086 478 | 1 100 619 | 1 102 839 | 1 063 699 | 1 077 913 | 1 088 989 | 1 074 095 | 1 068 733 | 1 059 835 | 1 045 087 | 1 013 750 |
| **Offshore** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOEM Federal Waters - Major Complexes | # complexes | 514 | 534 | 522 | 534 | 535 | 550 | 544 | 561 | 546 | 542 | 546 | 537 | 536 | 521 | 520 | 487 | 501 | 453 | 411 | 388 | 328 | 279 | 242 | 260 | 245 | 116 | 109 | 86 | 87 | 82 | 94 |
| SOEM Federal Waters - Minor Complexes | # complexes | 552 | 555 | 542 | 555 | 556 | 563 | 551 | 564 | 557 | 531 | 574 | 576 | 553 | 536 | 530 | 506 | 527 | 476 | 460 | 402 | 332 | 267 | 220 | 182 | 138 | 111 | 102 | 80 | 82 | 77 | 88 |
| NOM Federal Waters - Flaring | MMBtu/yr[of flared gas] | 830 000 | 795 976 | 587 743 | 587 527 | 601 948 | 710 565 | 877 827 | 1 111 731 | 1 138 722 | 858 799 | 726 090 | 738 229 | 758 200 | 558 505 | 590 183 | 650 905 | 527 761 | 575 620 | 1 297 067 | 1 238 278 | 1 656 807 | 1 580 951 | 1 142 332 | 856 980 | 921 996 | 636 831 | 537 236 | 438 165 | 652 137 | 661 470 | 498 202 |
| SOM Stripe Waters | MMcf gas | 266 866 | 217 615 | 294 857 | 328 149 | 428 583 | 396 091 | 420 864 | 436 724 | 410 372 | 363 171 | 392 460 | 352 697 | 343 398 | 320 007 | 272 958 | 228 955 | 335 715 | 280 096 | 215 357 | 218 841 | 192 492 | 171 746 | 176 753 | 151 102 | 127 451 | 107 152 | 102 599 | 86 681 | 75 288 | 72 219 | 68 736 |
| Alaska State Waters | MMcf gas | 91 539 | 91 285 | 111 180 | 105 988 | 105 327 | 119 645 | 116 966 | 115 955 | 119 515 | 115 101 | 115 861 | 103 146 | 101 623 | 89 417 | 79 868 | 75 327 | 62 366 | 49 132 | 45 160 | 44 525 | 42 930 | 37 102 | 38 103 | 37 267 | 22 726 | 16 512 | 17 062 | 13 726 | 10 719 | 10 956 | 10 316 |
| **Gathering and Boosting** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **GBA Stations** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressors | compressors | 8 076 | 8 288 | 8 628 | 8 837 | 9 138 | 9 288 | 9 548 | 9 981 | 9 548 | 9 353 | 9 699 | 9 779 | 9 765 | 9 897 | 9 775 | 9 765 | 10 228 | 10 653 | 11 054 | 11 854 | 12 022 | 12 492 | 13 694 | 14 246 | 13 926 | 15 465 | 16 352 | 16 205 | 17 394 | 18 502 | 18 978 |
| Tanks | tanks | 27 157 | 29 530 | 28 752 | 29 331 | 29 208 | 27 378 | 27 971 | 27 971 | 27 379 | 26 830 | 27 930 | 28 031 | 28 031 | 27 930 | 28 082 | 28 187 | 29 973 | 29 973 | 31 699 | 33 860 | 38 676 | 39 976 | 38 069 | 40 852 | 41 552 | 48 552 | 46 791 | 46 564 | 49 327 | 49 565 | 49 565 |
| Station Blowdowns | blown dwn events | 167 671 | 174 096 | 179 141 | 182 694 | 186 126 | 192 816 | 198 237 | 198 994 | 198 299 | 194 192 | 201 961 | 203 039 | 202 247 | 205 499 | 211 629 | 213 399 | 217 053 | 229 536 | 236 424 | 249 615 | 268 338 | 280 536 | 295 795 | 303 672 | 320 991 | 338 677 | 337 077 | 515 474 | 365 701 | 355 723 | 345 451 |
| Dehy Vents - Large units | dehydrators | 1 670 | 1 526 | 1 571 | 1 695 | 1 860 | 1 905 | 1 718 | 1 761 | 1 739 | 1 702 | 1 761 | 1 785 | 1 770 | 1 735 | 1 802 | 1 814 | 1 855 | 1 883 | 1 965 | 2 010 | 2 168 | 2 266 | 2 456 | 2 599 | 2 865 | 2 955 | 2 933 | 2 982 | 2 955 | 3 033 | 3 052 |
| Dehy Vents - Small units | dehydrators | 257 | 246 | 274 | 281 | 290 | 295 | 303 | 305 | 303 | 297 | 308 | 311 | 310 | 311 | 324 | 327 | 332 | 331 | 337 | 332 | 291 | 329 | 419 | 453 | 465 | 491 | 518 | 516 | 540 | 492 | 494 |
| High-Bleed Pneumatic Devices | devices | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 1 818 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 | 4 211 |
| Intermittent Bleed Pneumatic Devices | devices | 50 930 | 52 878 | 54 415 | 55 733 | 57 507 | 58 573 | 60 214 | 60 424 | 61 163 | 61 670 | 61 432 | 62 420 | 64 191 | 64 819 | 65 929 | 69 715 | 74 750 | 75 810 | 78 470 | 79 435 | 80 197 | 81 050 | 89 847 | 92 180 | 87 592 | 102 872 | 102 186 | 111 485 | 100 597 | 103 648 | 102 192 |
| Low-Bleed Pneumatic Devices | devices | 15 551 | 16 128 | 16 572 | 16 974 | 17 514 | 17 829 | 18 319 | 18 401 | 18 619 | 17 964 | 18 628 | 18 762 | 18 719 | 19 012 | 19 550 | 19 701 | 20 075 | 21 232 | 22 768 | 23 092 | 23 898 | 25 919 | 27 064 | 28 076 | 29 603 | 31 221 | 31 182 | 35 562 | 34 336 | 34 446 | 35 014 |
| Pneumatic Pumps | devices | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 | 1 748 |
| Flares | flares | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Pneumatic Pumps | devices | 8 966 | 9 039 | 9 178 | 8 811 | 10 135 | 10 212 | 10 600 | 10 600 | 10 600 | 10 288 | 10 767 | 10 857 | 10 815 | 10 989 | 11 300 | 11 651 | 11 606 | 12 273 | 13 161 | 13 338 | 13 818 | 14 981 | 15 857 | 16 228 | 17 144 | 18 110 | 18 025 | 13 936 | 14 668 | 15 776 | 16 372 |
| Combustion Slip | MMscf | 8 435 | 8 758 | 9 023 | 8 841 | 9 326 | 9 713 | 9 985 | 10 025 | 10 025 | 9 731 | 10 182 | 10 226 | 10 187 | 10 350 | 10 643 | 10 973 | 10 930 | 11 560 | 12 396 | 12 563 | 13 014 | 14 109 | 14 937 | 15 282 | 16 148 | 17 060 | 16 977 | 18 236 | 18 268 | 19 364 | 19 902 |
| Dehydrator Ldhr | dehydrators | 1 727 | 1 793 | 1 845 | 1 809 | 1 910 | 1 986 | 2 043 | 2 049 | 2 051 | 2 039 | 2 076 | 2 091 | 2 083 | 2 117 | 2 176 | 2 244 | 2 235 | 2 364 | 2 535 | 2 571 | 2 660 | 2 885 | 3 056 | 3 123 | 3 306 | 3 488 | 3 471 | 3 783 | 3 810 | 4 035 | 3 929 |
| Vent Piping | stations | 3 933 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 | 3 934 |
| Separators | separators | 9 967 | 6 176 | 6 356 | 6 508 | 6 715 | 6 880 | 7 031 | 7 056 | 7 031 | 6 788 | 7 032 | 7 202 | 7 271 | 7 179 | 7 289 | 7 695 | 7 569 | 7 448 | 8 145 | 8 700 | 8 853 | 9 168 | 9 897 | 10 395 | 10 764 | 11 385 | 12 053 | 11 955 | 12 233 | 13 081 | 13 261 |
| Desiccant Dehydrators | desiccant dehydrators | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 29 | 28 | 27 | 28 | 28 | 29 | 30 | 30 | 30 | 32 | 32 | 35 | 35 | 36 | 39 | 42 | 43 | 45 | 48 | 47 | 36 | 38 | 70 | 58 |
| GBA Pipeline Miles | miles | 238 758 | 269 600 | 267 935 | 251 896 | 258 670 | 253 776 | 260 208 | 267 580 | 273 699 | 274 999 | 283 472 | 300 982 | 312 176 | 323 523 | 3 6 151 | 351 769 | 371 102 | 388 066 | 408 610 | 414 691 | 414 951 | 418 910 | 423 218 | 422 825 | 417 993 | 413 255 | 410 888 | 406 910 | 398 810 | 393 247 | 383 128 |
| GBA Pipeline Blowdowns | miles | 238 758 | 269 600 | 267 935 | 251 896 | 258 670 | 253 776 | 260 208 | 267 580 | 273 699 | 274 999 | 283 472 | 300 982 | 312 176 | 323 523 | 3 6 151 | 351 769 | 371 102 | 388 066 | 408 610 | 414 691 | 414 951 | 418 910 | 423 218 | 422 825 | 417 993 | 413 255 | 410 888 | 406 910 | 398 810 | 393 247 | 383 128 |
| **GBA PROCESSING PLANTS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Facilities | plants | 741 | 734 | 732 | 726 | 721 | 675 | 623 | 621 | 559 | 581 | 585 | 570 | 590 | 574 | 572 | 566 | 571 | 578 | 577 | 579 | 585 | 606 | 606 | 650 | 647 | 667 | 667 | 667 | 667 | 667 | 667 |
| Reciprocating Compressors | compressors | 4 114 | 4 096 | 4 126 | 4 067 | 4 095 | 3 917 | 3 827 | 3 826 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 | 3 845 |
| Centrifugal Compressors (wet seals) | compressors | 665 | 680 | 665 | 648 | 636 | 581 | 526 | 505 | 453 | 461 | 454 | 452 | 437 | 414 | 402 | 377 | 380 | 370 | 361 | 350 | 342 | 341 | 341 | 366 | 376 | 376 | 398 | 342 | 347 | 356 | 346 |
| Centrifugal Compressors (dry seals) | compressors | 0 | 0 | 0 | 16 | 32 | 85 | 56 | 69 | 76 | 92 | 107 | 118 | 137 | 147 | 162 | 178 | 190 | 206 | 223 | 239 | 257 | 283 | 283 | 303 | 311 | 311 | 309 | 339 | 335 | 363 | 403 |
| Dehydrators | plants | 741 | 734 | 732 | 726 | 721 | 675 | 623 | 621 | 559 | 581 | 585 | 570 | 590 | 

## Table 3.6-8: Activity Data for Natural Gas Systems, Data Sources/Methodology

**Table Notes:**

For certain Exploration and Production segment sources, activity and emissions are calculated at a NEMS region-level, then summed to a national total.

*Italics indicate names of activity data elements documented elsewhere within the table*

| Segment/Source | Units | Data Source(s)/Methodology |
|---|---|---|
| **EXPLORATION** | | |
| Non-completion well testing - vented | events/yr | 2015-2020: [National-average activity factor (number of events per gas well) calculated from year-specific GHGRP subpart W data (EPA 2021c)] * [NEMS region-specific total producing gas well count in year N]. 1990-2014: [Year 2015 activity factor]* [NEMS region-specific total producing gas well count in year N]. Refer to EPA 2019c for additional detail. |
| Non-completion well testing - flared | events/yr | 2015-2020: [National-average activity factor (number of events per gas well) calculated from year-specific GHGRP subpart W data (EPA 2021c)] * [NEMS region-specific total producing gas well count in year N]. 1990-2014: [Year 2015 activity factor]* [NEMS region-specific total producing gas well count in year N]. Refer to EPA 2019c for additional detail. |
| HF Completions - Non-REC with Venting | events/yr | 2011-2020: year-specific, NEMS region-specific GHGRP subpart W # of hydraulically fractured well completions in the control category, as reported (EPA 2021c). 1990-2000: estimated NEMS region total HF completions based on DrillingInfo data (Enverus DrillingInfo 2021), assuming 0% RECs 1990-2000 and 10% flared events. 2001-2010: estimated NEMS region total HF completions based on DrillingInfo data, assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Completions - Non-REC with Flaring | events/yr | 2011-2020: year-specific, NEMS region-specific GHGRP subpart W # of hydraulically fractured well completions in the control category, as reported (EPA 2021c). 1990-2000: estimated NEMS region total HF completions based on DrillingInfo data (Enverus DrillingInfo 2021), assuming 0% RECs 1990-2000 and 10% flared events. 2001-2010: estimated NEMS region total HF completions based on DrillingInfo data, assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Completions - REC with Venting | events/yr | 2011-2020: year-specific, NEMS region-specific GHGRP subpart W # of hydraulically fractured well completions in the control category, as reported (EPA 2021c). 1990-2000: estimated NEMS region total HF completions based on DrillingInfo data (Enverus DrillingInfo 2021), assuming 0% RECs 1990-2000 and 10% flared events. 2001-2010: estimated NEMS region total HF completions based on DrillingInfo data, assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Completions - REC with Flaring | events/yr | 2011-2020: year-specific, NEMS region-specific GHGRP subpart W # of hydraulically fractured well completions in the control category, as reported (EPA 2021c). 1990-2000: estimated NEMS region total HF completions based on DrillingInfo data (Enverus DrillingInfo 2021), assuming 0% RECs 1990-2000 and 10% flared events. 2001-2010: estimated NEMS region total HF completions based on DrillingInfo data, assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| Non-HF Completions - vented | events/yr | 2011-2020: # of completions for 2002 base year (400 events (ICF 1997)) scaled by total producing gas well count in year N compared to base year, and applying year-specific national-average vented and flared fractions calculated from GHGRP subpart W data (EPA 2021c). 1990-2010: # of completions for 2002 base year (400 events) scaled by total |
| Non-HF Completions - flared | events/yr | |
| Well Blowouts | | Estimates of accidential releases (EPA 2021e). |
| Well Drilling | wells | Total gas wells drilled calculated for each NEMS region in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2019c for additional detail. |
| **PRODUCTION** | | |
| **Gas Wells** | | |
| Total Producing Gas Wells | wells | Total producing gas wells calculated for each NEMS region in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2015a and EPA 2017a for additional detail. |
| Non-associated Gas Wells (less fractured wells) | wells | *Total producing gas wells* minus *gas wells with hydraulic fracturing.* |
| Gas Wells with Hydraulic Fracturing | wells | Total producing gas wells with hydraulic fracturing calculated for each NEMS region for each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021) in conjunction with EIA formation type crosswalk (EIA 2012). Refer to EPA memos for additional detail (EPA 2015a, EPA 2017a). |
| **Well Pad Equipment** | | |
| Heaters | heaters | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from GHGRP subpart W RY2015 data]. 1993-2010: linear interpolation. Refer to EPA 2018a for additional detail. |
| Separators | separators | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from GHGRP subpart W RY2015 data]. 1993-2010: linear interpolation. Refer to EPA 2018a for additional detail. |
| Dehydrators | dehydrators | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from GHGRP subpart W RY2015 data]. 1993-2010: linear interpolation. Refer to EPA 2018a for additional detail. |
| Meters/Piping | meters | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from GHGRP subpart W RY2015 data]. 1993-2010: linear interpolation. Refer to EPA 2018a for additional detail. |
| Compressors | compressors | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from GHGRP subpart W RY2015 data]. 1993-2010: linear interpolation. Refer to EPA 2018a for additional detail. |
| **Well Workovers** | | |
| HF Workovers - Non-REC with Venting | events/yr | 2011-2020: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] * [national-average HF workover control category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1990-2000: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming 0% RECs and 10% flared events. 2001-2010: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Workovers - Non-REC with Flaring | events/yr | 2011-2020: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] * [national-average HF workover control category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1990-2000: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming 0% RECs and 10% flared events. 2001-2010: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Workovers - REC with Venting | events/yr | 2011-2020: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] * [national-average HF workover control category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1990-2000: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming 0% RECs and 10% flared events. 2001-2010: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| HF Workovers - REC with Flaring | events/yr | 2011-2020: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] * [national-average HF workover control category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1990-2000: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming 0% RECs and 10% flared events. 2001-2010: [gas wells with hydraulic fracturing in year N] * [1% HF well workover rate] and assuming linear growth rate from year 2000 control fractions to 2010 values. Refer to EPA 2013 for additional detail. |
| Non-HF Workovers - vented | events/yr | 2011-2020: [non-associated gas wells (less fractured wells)] * [assumed 4.35% of wells requiring workovers] * [national-average non-HF workover vented and flared fractions calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1990-2010: [non-associated gas wells (less fractured wells)] * [assumed 4.35% of wells requiring workovers], and applying year 2011 vented and flared fractions. |
| Non-HF Workovers - flared | events/yr | |
| **Normal Operations** | | |
| Pneumatic Device Vents | controllers | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2015-2020: [total producing gas wells in year N] * [per-well activity factor calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 2011-2014: [total producing gas wells in year N] * [per-well activity factor calculated from RY2015 GHGRP subpart W data)]. 1993-2010: linear interpolation. Refer to EPA 2016a for additional detail. |
| Pneumatic Device Vents - Low Bleed (LB) | controllers | [# of pneumatic device vents * device type fraction]. 1990-1992 device type fractions: high-bleed fraction = 0.35, intermittent-bleed fraction = 0.65, and low-bleed fraction = 0.00 (GRI/EPA 1996). 2011-2020 device type fractions: national-average device type fractions calculated from year-specific GHGRP subpart W data (EPA 2021c). 1993-2010 device type fractions: linear interpolation. Refer to EPA 2016a for additional detail. |
| Pneumatic Device Vents - High Bleed (HB) | controllers | [# of pneumatic device vents * device type fraction]. 1990-1992 device type fractions: high-bleed fraction = 0.35, intermittent-bleed fraction = 0.65, and low-bleed fraction = 0.00 (GRI/EPA 1996). 2011-2020 device type fractions: national-average device type fractions calculated from year-specific GHGRP subpart W data (EPA 2021c). 1993-2010 device type fractions: linear interpolation. Refer to EPA 2016a for additional detail. |
| Pneumatic Device Vents - Intermittent Bleed (IB) | controllers | [# of pneumatic device vents * device type fraction]. 1990-1992 device type fractions: high-bleed fraction = 0.35, intermittent-bleed fraction = 0.65, and low-bleed fraction = 0.00 (GRI/EPA 1996). 2011-2020 device type fractions: national-average device type fractions calculated from year-specific GHGRP subpart W data (EPA 2021c). 1993-2010 device type fractions: linear interpolation. Refer to EPA 2016a for additional detail. |
| Chemical Injection Pumps | pumps | 1990-1992: [total producing gas wells in year N] * [modified per-well activity factor (GRI/EPA 1996)]. 2011-2020: [total producing gas wells in year N] * [per-well activity factor calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1993-2010: linear interpolation. Refer to EPA 2016a for additional detail. |
| Kimray Pumps | MMscf/yr | [*Dehydrator vents* (MMscf/yr) in year N] * [89.1% of dehydrator throughput (GRI/EPA 1996)]. |
| Dehydrator Vents | MMscf/yr | [# of *Dehydrators* in year N]* [328.5 MMscf/yr-dehydator (GRI/EPA 1996)]. |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | MMscf/yr | Total gas production from active wells calculated for each basin or basin group in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2018b for additional detail. |
| Misc. Onshore Production Flaring (395 - Williston Basin) | MMscf/yr | Total gas production from active wells calculated for each basin or basin group in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2018b for additional detail. |

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|---|---|---|
| Misc. Onshore Production Flaring (430 - Permian Basin) | MMscf/yr | Total gas production from active wells calculated for each basin or basin group in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2018b for additional detail. |
| Misc. Onshore Production Flaring (Other Basins) | MMscf/yr | Total gas production from active wells calculated for each basin or basin group in each year N through analysis of DrillingInfo raw data feed (Enverus DrillingInfo 2021). Refer to EPA 2018b for additional detail. |
| **Condensate Tank Vents** | | |
| Large Tanks w/Flares | bbl/yr | [Lease condensate production in year N (EIA 2021b) (state-level assigned to NEMS regions)] * [79.4% of condensate sent to tanks based on analysis of RY2015 GHGRP subpart W data] * [Tank size and control category throughput fraction in year N]. 2015-2020 category throughput fractions: calculated from year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Set equal to year 2015 fractions. 1990-2010: Interpolation between zero controls assumed in 1990, to the fractions assigned in 2011. Refer to EPA 2017a for additional detail. |
| Large Tanks w/VRU | bbl/yr | [Lease condensate production in year N (EIA 2021b) (state-level assigned to NEMS regions)] * [79.4% of condensate sent to tanks based on analysis of RY2015 GHGRP subpart W data] * [Tank size and control category throughput fraction in year N]. 2015-2020 category throughput fractions: calculated from year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Set equal to year 2015 fractions. 1990-2010: Interpolation between zero controls assumed in 1990, to the fractions assigned in 2011. Refer to EPA 2017a for additional detail. |
| Large Tanks w/o Control | bbl/yr | [Lease condensate production in year N (EIA 2021b) (state-level assigned to NEMS regions)] * [79.4% of condensate sent to tanks based on analysis of RY2015 GHGRP subpart W data] * [Tank size and control category throughput fraction in year N]. 2015-2020 category throughput fractions: calculated from year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Set equal to year 2015 fractions. 1990-2010: Interpolation between zero controls assumed in 1990, to the fractions assigned in 2011. Refer to EPA 2017a for additional detail. |
| Small Tanks w/Flares | bbl/yr | [Lease condensate production in year N (EIA 2021b) (state-level assigned to NEMS regions)] * [79.4% of condensate sent to tanks based on analysis of RY2015 GHGRP subpart W data] * [Tank size and control category throughput fraction in year N]. 2015-2020 category throughput fractions: calculated from year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Set equal to year 2015 fractions. 1990-2010: Interpolation between zero controls assumed in 1990, to the fractions assigned in 2011. Refer to EPA 2017a for additional detail. |
| Small Tanks w/o Flares | bbl/yr | [Lease condensate production in year N (EIA 2021b) (state-level assigned to NEMS regions)] * [79.4% of condensate sent to tanks based on analysis of RY2015 GHGRP subpart W data] * [Tank size and control category throughput fraction in year N]. 2015-2020 category throughput fractions: calculated from year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Set equal to year 2015 fractions. 1990-2010: Interpolation between zero controls assumed in 1990, to the fractions assigned in 2011. Refer to EPA 2017a for additional detail. |
| Malfunctioning Separator Dump Valves | bbl/yr | Sum of bbl/yr throughput to large tanks in year N. Refer to EPA 2017a for additional detail. |
| **Compressor Exhaust Vented** | | |
| Gas Engines | MMHPhr/yr | Base year 1992 estimate of 27,460 MMHPhr (GRI/EPA 1996), scaled by total producing gas well count in year N compared to base year, then allocated to NEMS regions (excluding North East) based on region-specific fraction of *total producing gas well count* in year N. |
| **Well Clean Ups** | | |
| Liquids Unloading with Plunger Lifts | venting wells | 2015-2020: [total producing gas wells in year N] * [National-average fraction of gas wells requiring unloading and venting from year-specific GHGRP subpart W data (EPA 2021c) * [National-average split between with and without plunger categories calculated from year-specific GHGRP subpart W data]. 2011-2014: [total producing gas wells in year N] * [National average fraction of gas wells requiring unloading and venting from RY2015 GHGRP subpart W data] * [National-average split between with and without plunger categories calculated from year-specific GHGRP subpart W data]. 1990-2010: [total producing gas wells in year N] * Activity factors developed through interpolation between 1990 assumed to have zero plunger lifts and 56.3% of wells requiring unloading (API/ANGA 2012) to the activity factors assigned in 2011. Refer to EPA 2016a for additional detail. |
| Liquids Unloading without Plunger Lifts | venting wells | 2015-2020: [total producing gas wells in year N] * [National-average fraction of gas wells requiring unloading and venting from year-specific GHGRP subpart W data (EPA 2021c) * [National-average split between with and without plunger categories calculated from year-specific GHGRP subpart W data]. 2011-2014: [total producing gas wells in year N] * [National average fraction of gas wells requiring unloading and venting from RY2015 GHGRP subpart W data] * [National-average split between with and without plunger categories calculated from year-specific GHGRP subpart W data]. 1990-2010: [total producing gas wells in year N] * Activity factors developed through interpolation between 1990 assumed to have zero plunger lifts and 56.3% of wells requiring unloading (API/ANGA 2012) to the activity factors assigned in 2011. Refer to EPA 2016a for additional detail. |
| **Blowdowns** | | |
| Vessel Blowdowns | vessels | [# of *heaters* in year N] + [# of *separators* in year N] + [# of *dehydrators* in year N] |
| Compressor Blowdowns | compressors | # of *compressors* in year N |
| Compressor Starts | compressors | |
| **Upsets** | | |
| Pressure Relief Valves | PRV | Base year 1992 estimate of 529,440 PRVs (GRI/EPA 1996), scaled by total *producing gas well count* in year N compared to base year, then allocated to NEMS regions based on region-specific fraction of *total producing gas well count* in year N. |
| **Produced Water** | | |
| Natural Gas Wells | MMbbl produced water/yr | Produced water quantities from Enverus data (Enverus DrillingInfo 2021), supplemented with state-level data for IL, IN, KS, OK, PA, and WV using preliminary data from EPA's Draft 2020 NEI (EPA 2021f). Refer to EPA 2021b for details. |
| **Offshore** | | |
| GOM Federal Waters | Gas complexes | [Total major and minor gas complexes in year N (BOEM 2021a)] * [Percent oil complexes in year N (BOEM 2021b)]. Refer to EPA 2020a for detail. |
| GOM Federal Waters Flaring | MMBtu/yr | [Flared volume from gas facilities (BOEM 2021d)] * [natural gas heat content (EIA 2021h)] |
| GOM State Waters | MMscf | Sum of oil production from oil wells for AL (AL/OGB 2021), LA (LA/DNR 2021), and TX (TRC 2021) in year N. Refer to EPA 2020a for detail. |
| Alaska State Waters | MMscf | Sum of oil production from oil wells in Alaska state waters (AOGCC 2021a, AOGCC 2021b) in year N. Refer to EPA 2020a for detail. |
| **Gathering and Boosting** | | |
| G&B Stations | | |
| Compressors | compressors | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Tanks | tanks | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Station Blowdowns | blowdown events | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Dehy Vents - Large units | dehydrators | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Dehy Vents - Small units | dehydrators | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| High-bleed Pneumatic Devices | devices | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Intermittent Bleed Pneumatic Devices | devices | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Low-Bleed Pneumatic Devices | devices | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Flare Stacks | flare count | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| AGRU | AGRUs | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Pneumatic Pumps | devices | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Combustion Slip | units | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Dehydrator L&V | dehydrators | 1990-2015: [ratio of units per station, from RY2016 GHGRP data (EPA 2021c)] * [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2016-2020: [unit count from GHGRP data (EPA 2021c)] * [1.075 scaling factor (Zimmerle 2019)]. Refer to EPA 2020b for detail. |
| Yard Piping | stations | 1990-2016, 2018-2020: [2017 station count (Zimmerle 2019) scaled to year N using ratio of gas production between year 2017 and year N (Enverus DrillingInfo (2021))]. 2017: station count from Zimmerle 2019. Refer to EPA 2020b for detail. |
| Separators | separators | [2.05 separators per station] * [*estimated station count in year N*] |

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|---|---|---|
| G&B Pipeline Leaks | miles | 1990-2015: [NEMS region-specific total producing gas wells in year N] * [per-well activity factor (GRI/EPA 1996)] + [NEMS region-specific fraction of total producing gas wells in year N] * [assumed 82,600 miles of gathering pipeline owned by transmission companies (GRI/EPA 1996)]. 2016-2020: year-specific, GHGRP subpart W G&B pipeline miles, as reported (EPA 2021c). Refer to EPA 2019a for additional detail. |
| G&B Pipeline Blowdowns | miles | # of miles for *G&B pipeline leaks* in year N |
| **GAS PROCESSING PLANTS** | | |
| Plant Grouped Emission Sources | plants | 1990-2014: Count of records from Oil and Gas Journal "Worldwide Gas Processing" survey (OGJ 1997-2014). 2015-2020: Year 2014 data used as proxy. |
| Plant Fugitives | plants | # of *plants* in year N. |
| Reciprocating Compressors | compressors | 1990-1992: Base year 1992 estimate of 4,126 (ICF 2008) scaled by dry gas production in year N (EIA 2021c) compared to base year. 2015-2020: [# of plants in year N] * [reciprocating compressors per plant calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 2011-2014: [# of plants in year N] * [reciprocating compressors per plant calculated from RY2015 GHGRP subpart W data]. 1993-2010: [# of plants in year N] * [number of compressors per plant linearly interpolated between 1992 and 2011 factors]. Refer to EPA 2017b for additional detail. |
| Centrifugal Compressors (wet seals) | compressors | 1990-1992: Base year 1992 estimate of 665 wet seal compressors (ICF 2010) scaled by dry gas production (EIA 2021c). 2015-2020: [# of plants in year N] * [centrifugal compressors per plant and seal type fractions calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 2011-2014: [# of plants in year N] * [centrifugal compressors per plant calculated from RY2015 GHGRP subpart W data] * [seal type fraction calculated from year-specific GHGRP subpart W data]. 1993-2010: [# of plants in year N] * [number of centrifugal compressors per plant linearly interpolated between 1992 and 2011 factors] * [seal type fraction linearly interpolated between 1992 and 2011 fractions]. Refer to EPA 2017b for additional detail. |
| Centrifugal Compressors (dry seals) | compressors | |
| Flares | plants | # of *plants* in year N. |
| Dehydrators | plants | # of *plants* in year N. |
| Compressor Exhaust | | |
| Gas Engines | MMHPhr/yr | 1990-1992: Base year 1992 estimates of 29,642 for engines and 35,147 for turbines (ICF 2008) scaled by dry gas production in year N (EIA 2021c). 2015-2020: [# of plants in year N] * [MMhp-hr per plant calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 2011-2014: [# of plants in year N] * [MMhp-hr per plant calculated from RY2015 GHGRP subpart W data]. 1993-2010: [# of plants in year N] * [MMhp-hr per plant linearly interpolated between 1992 and 2011 factors]. Refer to EPA 2017b for additional detail. |
| Gas Turbines | MMHPhr/yr | |
| AGR Vents | AGR units or plants | CH4 emissions: Base year 1992 estimate of 371 units (GRI/EPA 1996), scaled by # of *plants* in year N compared to base year.<br>CO2 emissions: # of *plants* in year N. |
| Pneumatic Devices | gas plants | # of *plants* in year N. |
| Blowdowns/Venting | gas plants | # of *plants* in year N. |
| **TRANSMISSION AND STORAGE** | | |
| Pipeline Leaks | miles | Total transmission pipeline mileage in year N (PHMSA 2021a). |
| ***Compressor Stations (Transmission)*** | | |
| Station + Compressor Fugitive Emissions | stations | 1990-1992: Base year 1992 estimate of 1,730 (ICF 2008) scaled by total transmission pipeline mileage in year N compared to base year. 2011-2020: [GHGRP subpart W station count, as reported (EPA 2021c)] * [Scaling factor of 3.52 (Zimmerle et al. 2015)]. 1993-2010: linear interpolation. Refer to EPA 2016c for additional detail. |
| Reciprocating Compressor | compressors | 1990-1992: Base year 1992 estimate of 6,956 (ICF 2008) scaled by total transmission pipeline mileage in year N compared to base year. 2011-2020: Base year 2012 estimate of 4,518 (Zimmerle et al. 2015) scaled by transmission station count in year N compared to base year. 1993-2011: linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (total) | compressors | 1990-1992: Base year 1992 estimate of 698 (ICF 2010) scaled by total transmission pipeline mileage in year N compared to base year. 2011-2020: Base year 2012 estimate of 1,880 (Zimmerle et al. 2015) scaled by transmission station count in year N compared to base year. 1993-2011: linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (wet seals) | compressors | 1990-1992: Base year 1992 estimate of 698 for wet seal and 0 for dry seal (ICF 2010) scaled by total transmission pipeline mileage in year N compared to base year. 2011-2020: [total centrifugal compressors] * [seal type fraction calculated from GHGRP subpart W year-specific data (EPA 2021c)]. 1993-2011: linear interpolation. Refer to EPA 2016c for additional detail. |
| Centrifugal Compressor (dry seals) | compressors | |
| ***Compressor Stations (Storage)*** | | |
| Station + Compressor Fugitive Emissions | stations | 1990-1992: Base year 1992 estimate of 386 (ICF 1997) scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. 2005-2020: [Active storage field count in year N (EIA 2021e) * 0.89 stations per storage field (Zimmerle et al. 2015)]. 1993-2004: linear interpolation. Refer to EPA 2016c for additional detail. |
| Reciprocating Compressor | compressors | 1990-2011: n/a - Not estimated (emissions calculated at station total level). 2012-2020: [Base year 2012 compressor count of 1,512 (Zimmerle et al. 2015) scaled by storage station count in year N compared to base year. |
| Wells (Storage) | wells | Base year 1992 estimate of 17,999 (GRI/EPA 1996) scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| M&R (Trans. Co. Interconnect) | stations | Base year 1992 estimate of 2,595 (ICF 2008) scaled by *total transmission pipeline mileage* in year N compared to base year. |
| M&R (Farm Taps + Direct Sales) | stations | Base year 1992 estimate of 76,932 (ICF 2008) scaled by *total transmission pipeline mileage* in year N compared to base year. |
| ***Normal Operation*** | | |
| Dehydrator vents (Transmission) | MMscf/yr | [*Transmission station count* in year N] * [0.118 dehydrators/station (GRI/EPA 1996)] * [15 MMscf/yr gas throughput (GRI/EPA 1996)]. |
| Dehydrator vents (Storage) | MMscf/yr | Base year 1992 estimate of 2,000,001 (GRI/EPA 1996) scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| Flaring (Transmission) | stations | *Transmission station count* in year N. Refer to EPA 2018b for additional detail. |
| Flaring (Storage) | stations | *Storage station count* in year N. Refer to EPA 2018b for additional detail. |
| ***Compressor Exhaust*** | | |
| Engines (Transmission) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator |
| Turbines (Transmission) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator turbines (GRI/EPA 1996)--scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| Engines (Storage) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator turbines (GRI/EPA 1996)--scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| Turbines (Storage) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator turbines (GRI/EPA 1996)--scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| Generators (Engines) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator turbines (GRI/EPA 1996)--scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| Generators (Turbines) | MMHPhr/yr | Base year 1992 estimates--40,380 for trans. engines; 9,635 for trans. turbines; 4,922 for storage engines; 1,729 for storage turbines; 1,976 for generator engines; 23 for generator turbines (GRI/EPA 1996)--scaled by residential natural gas consumption in year N (EIA 2021d) compared to base year. |
| ***Pneumatic Devices Trans + Stor*** | | |
| Pneumatic Devices Transmission | devices | 1990-1992: Base year 1992 estimate of 68,103 (GRI/EPA 1996) scaled by total transmission pipeline mileage in year N compared to base year. 2011-2020: [transmission station count in year N] * [controllers per station calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1993-2010: linear interpolation. Refer to EPA 2016c for additional detail. |
| (High Bleed) | devices | 1990-2010: n/a - Not estimated. 2011-2020: [# of transmission pneumatic devices in year N] * [bleed rate category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. Refer to EPA 2016c for additional detail. |
| (Intermittent Bleed) | devices | |
| (Low Bleed) | devices | |
| Pneumatic Devices Storage | devices | 1990-1992: Base year 1992 estimate of 15,460 (ICF 1997) scaled by storage station count in year N compared to base year. 2011-2020: [storage station count in year N] * [controllers per station calculated from year-specific GHGRP subpart W data (EPA 2021c)]. 1993-2010: linear interpolation. Refer to EPA 2016c for additional detail. |
| (High Bleed) | devices | 1990-2010: n/a - Not estimated. 2011-2020: [# of storage pneumatic devices in year N] * [bleed rate category fraction calculated from year-specific GHGRP subpart W data (EPA 2021c)]. Refer to EPA 2016c for additional detail. |
| (Intermittent Bleed) | devices | |
| (Low Bleed) | devices | |
| ***Routine Maintenance/Upsets*** | | |
| Pipeline venting | miles | *Total transmission pipeline mileage* in year N. |
| ***Station venting Trans + Storage*** | | |
| Station Venting Transmission | stations | *Transmission station count* in year N. |
| Station Venting Storage | stations | *Storage station count* in year N. |
| **LNG Storage** | | |
| LNG Stations (eq. leaks, compressors, flares) | facilities | # Complete storage facilities + satellite facilities. 1992 facility counts: Base year estimate of 53 complete and 28 satellite facilities (GRI/EPA 1996). 2003 facility counts: Base year estimate of 57 complete and 39 satellite facilities (EIA 2004). 1990-1991 and 1993-2002 facility counts: Calculated based on growth rate between base years. 2004-2009 facility counts: Year 2003 values used as proxy. 2010-2020: facility counts in year N from PHMSA data (PHMSA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Station Blowdowns | facilities | *LNG storage facility count* in year N. |

| | | |
|---|---|---|
| LNG Station Engine Exhaust | MMHPhr | [horsepower hours per station, calculated from GHGRP subpart W RY2015-2020 data (EPA 2021c)] * [LNG storage facility count in year N]. Refer to EPA 2019b for additional detail. |
| LNG Station Turbine Exhaust | MMHPhr | [horsepower hours per station, calculated from GHGRP subpart W RY2015-2020 data (EPA 2021c)] * [LNG storage facility count in year N]. Refer to EPA 2019b for additional detail. |
| **LNG Import/Export Terminals** | | |
| LNG Import Terminals (eq. leaks, compressors, flares) | terminals | 1990-2003: count of import terminals in year N (EIA 2004, FERC 2017). 2004-2020: count of import terminals in year N (DOE 2021). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Blowdowns | terminals | 1990-2003: count of import terminals in year N (EIA 2004, FERC 2017). 2004-2019: count of import terminals in year N (DOE 2021). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Engine Exhaust | MMHPhr | [horsepower hours per import terminal, calculated from GHGRP subpart W RY2015-2020 data (EPA 2021c)] * [LNG import terminal count in year N]. Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Turbine Exhaust | MMHPhr | [horsepower hours per import terminal, calculated from GHGRP subpart W RY2015-2020 data (EPA 2021c)] * [LNG import terminal count in year N]. Refer to EPA 2019b for additional detail. |
| LNG Export Terminals (eq. leaks, compressors, flares) | terminals | 1990-2015: Count of export terminals (EIA 2004, DOE 2021). 2016-2020: counts of export terminals from DOE 2021. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Blowdowns | terminals | 1990-2015: Count of export terminals (EIA 2004, DOE 2021). 2016-2020: counts of export terminals from DOE 2021. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Engine Exhaust | MMHPhr | 1990-2014: [horsepower hours per export terminal, calculated from GHGRP subpart W RY2015 data] * [LNG export terminal count in year N]. 2015-2020: [horsepower hours per export terminal, calculated from year-specific GHGRP subpart W data (EPA 2021c)] * [LNG export terminal count in year N]. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Turbine Exhaust | MMHPhr | 1990-2014: [horsepower hours per export terminal, calculated from GHGRP subpart W RY2015 data] * [LNG export terminal count in year N]. 2015-2020: [horsepower hours per export terminal, calculated from year-specific GHGRP subpart W data (EPA 2021c)] * [LNG export terminal count in year N]. Refer to EPA 2019b for additional detail. |
| **DISTRIBUTION** | | |
| ***Pipeline Leaks*** | | |
| Mains - Cast Iron | miles | Material-specific mileage of distribution mains in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Mains - Unprotected steel | miles | Material-specific mileage of distribution mains in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Mains - Protected steel | miles | Material-specific mileage of distribution mains in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Mains - Plastic | miles | Material-specific mileage of distribution mains in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Total Pipeline Miles | miles | Total *miles of mains* (all pipeline material types). |
| Services - Unprotected steel | services | Material-specific counts of distribution services in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Services Protected steel | services | Material-specific counts of distribution services in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Services - Plastic | services | Material-specific counts of distribution services in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Services - Copper | services | Material-specific counts of distribution services in year N (PHMSA 2021b). Refer to EPA 2016d for additional detail. |
| Total Services | services | Total *services* (all pipeline material types). |
| ***Meter/Regulator (City Gates)*** | | |
| M&R >300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| M&R 100-300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| M&R <100 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| Reg >300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| R-Vault >300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| Reg 100-300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| R-Vault 100-300 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| Reg 40-100 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| R-Vault 40-100 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| Reg <40 | stations | 1990-2006: [Base year 1992 estimate of stations per mile in each category (GRI/EPA 1996)] * [total miles of distribution pipeline in year N]. 2007-2010: [Base year 1992 estimate of stations per mile in each category scaled by residential gas consumption in year N (EIA 2021d) compared to base year] * [total miles of distribution pipeline in year N]. 2011-2020: Year-specific GHGRP subpart W reported station count in each category scaled by total miles of mains compared to reported miles of mains. Refer to EPA 2016d for additional detail. |
| ***Customer Meters*** | | |
| Residential | outdoor meters | [Number of residential natural gas consumers in year N (EIA 2021g)] * [Weighted average percentage of meters outdoors (GRI/EPA 1996)]. Refer to EPA 2016d for additional detail. |
| Commercial | meters | Total number of commercial natural gas consumers in year N (EIA 2021g). Refer to EPA 2021a for additional detail. |
| Industrial | meters | Total number of industrial natural gas consumers in year N (EIA 2021g). Refer to EPA 2021a for additional detail. |
| ***Routine Maintenance*** | | |
| Pressure Relief Valve Releases | mile main | Total *miles of mains* (all pipeline material types). |
| Pipeline Blowdown | miles | Total miles of distribution pipeline (mains + services) (PHMSA 2021b). |
| ***Upsets*** | | |
| Mishaps (Dig-ins) | miles | Total miles of distribution pipeline (mains + services) (PHMSA 2021b). |
| **POST-METER** | | |
| Residential | NG houses | National counts of residential housing units that use natural gas as a fuel in year N (U.S. Census Bureau 2021). |
| Commercial | appliances | Total number of commercial natural gas consumers in year N (EIA 2021g) * Average appliances per commercial meter (EIA 2021i). |
| Industrial & EGUs | BCF | Annual natural gas consumption in the industrial and power utilities sectors (EIA 2021d). |
| NG Vehicles | CNG vehicles | National counts of CNG vehicles from MOVES3 (EPA 2021d). |

| Table 3.6-9: Voluntary and Regulatory CH4 Reductions for Natural Gas Systems (kt) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Segment/Source** | **1990** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** |
| **Production** | - | - | - | **6.8** | **8.9** | **12.9** | **21.6** | **29.1** | **38.9** | **62.0** | **58.0** | **62.6** | **61.1** | **75.2** | **86.5** | **83.0** | **98.4** | **107.1** | **137.0** | **141.6** | **163.9** | **168.1** | **99.5** | **100.0** | **94.1** | **95.3** | **96.4** | **107.9** | **90.3** | **91.8** | **91.6** |
| **Gas STAR** | - | - | - | **6.8** | **8.9** | **12.9** | **21.6** | **29.1** | **38.9** | **46.3** | **42.6** | **48.2** | **47.0** | **62.1** | **73.9** | **71.2** | **87.7** | **97.1** | **128.3** | **133.3** | **155.9** | **160.3** | **91.7** | **92.3** | **86.4** | **87.6** | **88.8** | **100.4** | **82.8** | **84.4** | **84.4** |
| Compressors | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2.8 | 1.0 | 0.5 | 1.0 | 1.0 | 0.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dehydrator Vents | - | - | - | 0.9 | 1.2 | 1.6 | 3.0 | 4.8 | 5.5 | 5.5 | 5.8 | 6.9 | 6.4 | 7.4 | 7.8 | 8.5 | 10.4 | 12.5 | 15.3 | 17.0 | 17.0 | 16.5 | 11.6 | 12.0 | 12.0 | 12.0 | 12.0 | 12.4 | 12.0 | 12.2 | 12.2 |
| Kimray Pumps | - | - | - | 2.9 | 3.8 | 5.2 | 9.4 | 15.2 | 17.4 | 17.3 | 18.5 | 21.8 | 20.4 | 23.4 | 24.7 | 26.9 | 33.0 | 40.5 | 51.1 | 54.2 | 58.5 | 63.0 | 36.8 | 38.2 | 38.2 | 38.2 | 38.3 | 39.5 | 38.3 | 38.9 | 38.9 |
| Engines | - | - | - | 3.0 | 3.8 | 5.8 | 8.6 | 8.3 | 6.3 | 9.1 | 9.5 | 9.8 | 10.5 | 7.9 | 15.9 | 12.2 | 13.4 | 18.7 | 17.6 | 20.6 | 29.1 | 29.2 | 29.1 | 28.8 | 30.1 | 32.3 | 30.9 | 44.6 | 31.4 | 32.1 | 32.1 |
| Produced Water | - | - | - | - | - | - | - | - | - | - | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Equipment Leaks | - | - | - | - | 0.0 | 0.3 | 0.6 | 0.8 | 9.7 | 14.4 | 8.1 | 9.1 | 9.1 | 22.8 | 24.8 | 20.1 | 29.2 | 23.9 | 42.2 | 39.4 | 50.0 | 48.8 | 13.2 | 12.3 | 5.1 | 4.0 | 6.5 | 2.7 | 0.0 | 0.1 | 0.1 |
| **Regulatory** | - | - | - | - | - | - | - | - | - | **15.7** | **15.4** | **14.4** | **14.0** | **13.1** | **12.6** | **11.8** | **10.7** | **10.0** | **8.7** | **8.4** | **8.0** | **7.8** | **7.8** | **7.7** | **7.7** | **7.7** | **7.6** | **7.5** | **7.5** | **7.4** | **7.2** |
| Dehydrator Vents | - | - | - | - | - | - | - | - | - | 15.7 | 15.4 | 14.4 | 14.0 | 13.1 | 12.6 | 11.8 | 10.7 | 10.0 | 8.7 | 8.4 | 8.0 | 7.8 | 7.8 | 7.7 | 7.7 | 7.7 | 7.6 | 7.5 | 7.5 | 7.4 | 7.2 |
| **Transmission and Storage** | - | - | - | **3.9** | **6.4** | **10.3** | **13.1** | **14.4** | **37.0** | **38.2** | **41.0** | **48.2** | **58.9** | **64.3** | **70.9** | **72.9** | **83.1** | **82.3** | **93.1** | **101.6** | **90.3** | **90.3** | **95.2** | **95.1** | **99.0** | **100.8** | **115.4** | **123.1** | **143.5** | **153.8** | **153.8** |
| **Gas STAR** | - | - | - | **3.9** | **6.4** | **10.3** | **13.1** | **14.4** | **37.0** | **38.2** | **41.0** | **48.2** | **58.9** | **64.3** | **70.9** | **72.9** | **83.1** | **82.3** | **93.1** | **101.6** | **90.3** | **90.3** | **95.2** | **95.1** | **99.0** | **100.8** | **115.4** | **123.1** | **143.5** | **153.8** | **153.8** |
| Engines | - | - | - | 2.8 | 6.0 | 9.1 | 11.4 | 13.5 | 35.8 | 37.1 | 38.7 | 44.5 | 56.3 | 57.7 | 65.9 | 70.8 | 73.8 | 80.6 | 86.9 | 98.3 | 86.8 | 87.8 | 91.9 | 91.6 | 95.7 | 97.2 | 97.3 | 97.1 | 115.1 | 132.4 | 132.4 |
| Station Venting | - | - | - | 1.1 | 0.4 | 1.2 | 1.6 | 0.9 | 1.2 | 1.1 | 2.2 | 3.8 | 2.6 | 6.6 | 5.1 | 2.0 | 9.3 | 1.7 | 6.1 | 3.3 | 3.5 | 2.5 | 3.3 | 3.6 | 3.2 | 3.6 | 18.2 | 26.0 | 28.4 | 21.4 | 21.4 |
| **Distribution** | - | - | - | **1.0** | **1.8** | **1.3** | **1.6** | **3.4** | **1.7** | **1.6** | **1.5** | **1.6** | **4.3** | **2.7** | **4.0** | **4.5** | **4.8** | **5.4** | **4.3** | **4.1** | **4.6** | **7.6** | **3.4** | **4.1** | **3.9** | **4.3** | **4.2** | **4.5** | **5.0** | **3.8** | **3.8** |
| **Gas STAR** | - | - | - | **1.0** | **1.8** | **1.3** | **1.6** | **3.4** | **1.7** | **1.6** | **1.5** | **1.6** | **4.3** | **2.7** | **4.0** | **4.5** | **4.8** | **5.4** | **4.3** | **4.1** | **4.6** | **7.6** | **3.4** | **4.1** | **3.9** | **4.3** | **4.2** | **3.8** | **4.1** | **3.6** | **3.6** |
| Mishaps (Dig-ins) | - | - | - | - | - | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 | 0.3 | 0.6 | 0.8 | 2.4 | 1.1 | 1.5 | 1.6 | 5.4 | 1.4 | 1.9 | 2.1 | 2.0 | 2.2 | 1.4 | 1.3 | 1.4 | 1.4 |
| Pipeline Blowdown | - | - | - | 1.0 | 1.8 | 1.3 | 1.6 | 3.4 | 1.5 | 1.6 | 1.5 | 1.6 | 3.1 | 2.6 | 3.6 | 3.9 | 4.0 | 3.0 | 3.0 | 2.7 | 3.0 | 2.2 | 2.0 | 2.2 | 1.9 | 2.3 | 2.0 | 2.3 | 2.8 | 2.2 | 2.2 |
| Pressure Relief Valve Releases | - | - | - | - | - | - | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 1.1 | - | - | 0.0 | 0.0 | - | 0.1 | 0.0 | 0.0 | - | - | - | 0.0 | 0.0 | - | - | - | - | - |
| **Methane Challenge** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **0.8** | **0.9** | **0.2** | **0.2** |
| Pipeline Blowdown | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.0 | 0.8 | 0.2 | 0.2 |
| Pressure Relief Valve Releases | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.8 | 0.1 | 0.0 | 0.0 |
| **Total Reductions** | - | - | - | **11.6** | **17.2** | **24.5** | **36.3** | **47.0** | **77.6** | **101.8** | **100.5** | **112.5** | **124.2** | **142.2** | **161.4** | **160.4** | **186.3** | **194.8** | **234.3** | **247.4** | **258.8** | **266.1** | **198.1** | **199.2** | **197.0** | **200.4** | **216.0** | **235.5** | **238.7** | **249.4** | **249.2** |

## Table 3.6-10: CO2 Emissions (kt) for Natural Gas Systems, by Segment and Source, for All Years

**Table Footnotes:**

"NE" indicates value not estimated

"IE" indicates the emissions were included elsehwere (i.e., the emissions are included at an aggregated level)

[a] Plant grouped emission sources include fugitives, compressors, dehydrators, and flares

| Segment/Source | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **297.3** | **296.8** | **215.5** | **274.2** | **271.9** | **258.1** | **299.3** | **418.0** | **378.5** | **431.0** | **584.4** | **842.3** | **729.0** | **925.1** | **1,148.1** | **1,433.6** | **1,787.5** | **1,940.8** | **2,239.3** | **1,372.7** | **1,466.1** | **1,839.3** | **1,273.4** | **1,211.5** | **788.7** | **281.9** | **190.1** | **444.3** | **336.3** | **220.5** | **94.7** |
| Non-completion well testing - vented | 0.03 | 0.03 | 0.03 | 0.04 | 0 04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 04 | 0.01 | 0.00 | 0.00 | 0.00 |
| Non-completion well testing - flared | 3.77 | 4.21 | 4.13 | 4.26 | 4.45 | 4.34 | 4.60 | 4.86 | 5.03 | 5.05 | 5.19 | 5.67 | 5.86 | 6.19 | 6.45 | 6 81 | 7.28 | 7.63 | 8.19 | 8.31 | 8.47 | 8.58 | 8.61 | 8.53 | 8.41 | 8.49 | 0 33 | 0.29 | 16.70 | 6.00 | 0.00 |
| HF Completions - Non-REC with Venting | 7.4 | 7.3 | 5.3 | 6.8 | 6.7 | 6.3 | 7.4 | 10.4 | 9.4 | 10.7 | 14.7 | 19.2 | 15.1 | 17.4 | 19.7 | 22.3 | 25.3 | 24.9 | 26.0 | 14 3 | 13.8 | 12.8 | 2.9 | 10.2 | 2.2 | 0.2 | 0 05 | 0.4 | 0.0 | 0 0 | 0.0 |
| HF Completions - Non-REC with Flaring | 281.1 | 279.7 | 200.7 | 257.6 | 254.9 | 241.7 | 281.2 | 396.3 | 357 5 | 408.5 | 557.7 | 763.8 | 624.9 | 756.4 | 896.9 | 1,072.0 | 1,281.3 | 1,334.5 | 1,479.8 | 867 8 | 893.5 | 1,182.3 | 595.9 | 305.8 | 306.8 | 48.8 | 12.3 | 37.2 | 54.2 | 42 3 | 9.7 |
| HF Completions - REC with Venting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.3 | 0.5 | 1.0 | 1.5 | 2.3 | 3.3 | 4.0 | 5.1 | 3 3 | 3.8 | 4.4 | 0.8 | 1.6 | 0.1 | 0.6 | 0.2 | 0.5 | 2.8 | 0 2 | 0.1 |
| HF Completions - REC with Flaring | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 45.8 | 74.9 | 136.0 | 215.0 | 321.2 | 460.6 | 559.7 | 709.3 | 468 0 | 535.4 | 620.1 | 664.4 | 877.9 | 468.2 | 217.5 | 164.1 | 398.4 | 232.7 | 171 8 | 84.5 |
| Non-HF Completions - vented | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0 5 | 0.5 | 0.5 | 0.1 | 0.2 | 0.1 | 0.2 | 0.8 | 0.01 | 0.0 | 0 1 | 0.4 |
| Non-HF Completions - flared | 4.66 | 5.21 | 5.11 | 5.27 | 5 50 | 5.37 | 5.69 | 6.02 | 6.22 | 6.24 | 6.42 | 7.02 | 7.24 | 7.65 | 7.97 | 8.42 | 9.01 | 9.44 | 10.13 | 10.27 | 10.48 | 10.62 | 0.57 | 7.23 | 2.74 | 6.13 | 12.3 | 7.4 | 29.8 | 0 0 | 0.0 |
| Well Drilling | 0.1 | 0.04 | 0.1 | 0.04 | 0.0 | 0.0 | 0.1 | 0.1 | 0 1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0 1 | 0.1 | 0 1 | 0.03 | 0.03 | 0.03 | 0.01 | 0 01 | 0.02 | 0.1 | 0 1 | 0.1 |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **3,023.9** | **3,140.1** | **3,186.9** | **3,315.0** | **3,470.9** | **3,531.8** | **3,714.0** | **3,812.3** | **3,869.9** | **3,849.1** | **3,982.0** | **4,126.4** | **4,169.2** | **4,251.3** | **4,384.1** | **4,467.8** | **4,629.7** | **4,878.1** | **5,284.4** | **5,343.9** | **5,693.8** | **6,489.0** | **6,413.2** | **6,805.7** | **7,299.4** | **7,615.3** | **7,444.3** | **7,194.2** | **8,503.1** | **10,885.2** | **7,736.4** |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wel | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 2.0 | 2 0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.4 | 2.6 | 2.6 | 2.8 | 2.8 | 2.9 | 2 9 | 2.9 | 2.9 | 2.8 | 2.8 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2 5 | 2.5 |
| Gas Wells with Hydraulic Fracturing | 0.3 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 1.0 | 1.1 | 1.1 | 1.2 | 1 2 | 1.3 | 1 3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1 4 | 1.4 |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.0 | 1 9 | 2.0 | 2.0 | 2.0 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 | 1.8 | 1 8 | 1.8 |
| Separators | 6.1 | 6.2 | 6.3 | 6.4 | 6.9 | 6.6 | 6.8 | 7.0 | 7.4 | 7.6 | 8.7 | 10.0 | 11.2 | 12.2 | 13.4 | 14.7 | 16.2 | 17.7 | 19.0 | 19.4 | 19.5 | 19.7 | 19.6 | 19.2 | 18.9 | 18.8 | 18.4 | 18.1 | 18.1 | 17 8 | 17.7 |
| Dehydrators | 1.4 | 1.5 | 1.5 | 1.5 | 1.4 | 1.5 | 1.5 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 0.9 | 0.8 | 0 8 | 0.8 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0 7 | 0.7 |
| Meters/Piping | 6.1 | 6.3 | 6.3 | 6.4 | 6.6 | 6.6 | 6.8 | 7.0 | 7.1 | 7.2 | 7.5 | 8.0 | 8.3 | 8.7 | 9.0 | 9.4 | 9.9 | 10.3 | 10.8 | 10 9 | 11.0 | 11.1 | 11.0 | 10.8 | 10.7 | 10.7 | 10.5 | 10.3 | 10.3 | 10 2 | 10.1 |
| Compressors | 3.0 | 3.1 | 3.1 | 3.3 | 3.5 | 3.5 | 3.8 | 4.1 | 4 3 | 4.3 | 4.4 | 5.0 | 5.2 | 5.6 | 5.8 | 6.1 | 6.6 | 6.9 | 7.4 | 7 5 | 7.7 | 7.8 | 7.9 | 7.8 | 7.6 | 7.7 | 7.6 | 7.6 | 7.6 | 7 5 | 7.4 |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | 1.4 | 1.9 | 1.8 | 1.9 | 2.1 | 2.1 | 2.3 | 2.5 | 2.6 | 2.6 | 2.9 | 3.1 | 3.2 | 3.4 | 3.5 | 3.8 | 4.1 | 4.2 | 4.6 | 4.6 | 4.7 | 3.7 | 2.3 | 7.2 | 1.9 | 0.3 | 0.3 | 1.2 | 0.1 | 0 2 | 0.0 |
| HF Workovers - Non-REC with Flaring | 54.1 | 70.8 | 68.6 | 73.9 | 79.8 | 80.6 | 87.6 | 94.8 | 98 8 | 100.1 | 109.1 | 121.2 | 127.6 | 138.0 | 145.2 | 160.2 | 174.9 | 186.6 | 206.3 | 213 5 | 221.9 | 596.3 | 46.7 | 62.8 | 139.2 | 9.3 | 11.0 | 38.2 | 90.8 | 67 1 | 4.6 |
| HF Workovers - REC with Venting | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.03 | 0.07 | 0.11 | 0.16 | 0 22 | 0.29 | 0.35 | 0.45 | 0.52 | 0.60 | 0.68 | 0.04 | 0.44 | 0.03 | 0.33 | 0 08 | 0.22 | 1.64 | 0.11 | 0.15 |
| HF Workovers - REC with Flaring | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.122 | 0.257 | 0.417 | 0.585 | 0.806 | 1.06 | 1.31 | 1.66 | 1.93 | 2 23 | 2.53 | 9.4 | 49.2 | 4.9 | 39.5 | 41.4 | 322.8 | 6.5 | 18 3 | 3.2 |
| Non-HF Workovers - vented | 0.03 | 0.03 | 0.03 | 0.03 | 0 03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0 04 | 0.05 | 0.05 | 0.05 | 0.05 | 0 05 | 0.05 | 0.11 | 0.03 | 0.03 | 0.05 | 0 03 | 0.04 | 0.03 | 0.03 | 0.46 |
| Non-HF Workovers - flared | 0.0 | 0.0 | 0.0 | 0.219 | 0.450 | 0.647 | 0.90 | 1.17 | 1.45 | 1.69 | 1.91 | 2.33 | 2.63 | 3.01 | 3.40 | 3.76 | 4.26 | 4.71 | 5.25 | 5.55 | 5 89 | 6.21 | 0.1162 | 1.14 | 0.638 | 3.77 | 3.123 | 0 270 | 0.156 | 0.267 | 0.016 |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | 48.4 | 51.7 | 51.3 | 54.6 | 60.3 | 54.6 | 62.1 | 69.4 | 72 8 | 71.3 | 73.0 | 85.0 | 87.0 | 93.4 | 96.9 | 102.9 | 111.1 | 115.4 | 124.5 | 122.4 | 121.9 | 119.4 | 124.7 | 131.9 | 122.8 | 123.3 | 117.2 | 121.0 | 118.1 | 113 3 | 105.8 |
| (Low Bleed) | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0 5 | 0.5 | 0.7 | 0.9 | 1.0 | 1.3 | 1.5 | 1.8 | 2.1 | 2.4 | 2.9 | 3.1 | 3.4 | 3.7 | 3.2 | 2.1 | 2.5 | 2.5 | 2.4 | 2.7 | 2.6 | 2 5 | 2.4 |
| (High Bleed) | 25.4 | 27.1 | 27.0 | 28.2 | 30.7 | 27.3 | 30.5 | 33.3 | 34 2 | 32.7 | 32.6 | 36.9 | 36.7 | 38.1 | 38.1 | 38.8 | 40.0 | 39.5 | 40.3 | 37.1 | 34.2 | 30.6 | 26.3 | 15.2 | 11.0 | 8.7 | 8.9 | 9.3 | 7.7 | 6 0 | 3.5 |
| (Intermittent Bleed) | 23.0 | 24.5 | 24.4 | 26.3 | 29.5 | 27.2 | 31.4 | 35.7 | 38.1 | 38.0 | 39.7 | 47.2 | 49.3 | 54.1 | 57.3 | 62.3 | 68.9 | 73.5 | 81.3 | 82 2 | 84.2 | 85.1 | 95.2 | 114.7 | 109.3 | 112.1 | 105.9 | 109.0 | 107.8 | 104 8 | 99.9 |
| Chemical Injection Pumps | 2.3 | 2.3 | 2.3 | 2.6 | 3.1 | 2.7 | 3.3 | 3.9 | 4 3 | 4.3 | 4.5 | 5.5 | 5.8 | 6.5 | 7.0 | 7.8 | 8.7 | 9.4 | 10.6 | 10 8 | 11.3 | 11.5 | 11.5 | 11.4 | 11.2 | 11.4 | 11.2 | 11.1 | 11.1 | 10 9 | 10.6 |
| Kimray Pumps | 15.7 | 17.6 | 17.3 | 17.1 | 16.7 | 17.2 | 16.8 | 16.3 | 16 0 | 16.0 | 15.6 | 14.6 | 14.2 | 13.5 | 13.0 | 12.2 | 11.3 | 10.5 | 9.4 | 9 1 | 8.8 | 8.6 | 8.6 | 8.5 | 8.4 | 8.5 | 8.4 | 8.3 | 8.3 | 8 2 | 8.1 |
| Dehydrator Vents | 4.9 | 5.5 | 5.4 | 5.3 | 5.2 | 5.4 | 5.2 | 5.1 | 5 0 | 5.0 | 4.9 | 4.6 | 4.4 | 4.2 | 4.0 | 3.8 | 3.5 | 3.3 | 2.9 | 2 8 | 2.7 | 2.7 | 2.7 | 2.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2 6 | 2.5 |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | 0.0 | 0.0 | 0.0 | 14.1 | 28.2 | 43.7 | 61.3 | 75.5 | 90 9 | 103.3 | 122.8 | 136.7 | 141.4 | 150.1 | 160.5 | 165.5 | 174.5 | 180.9 | 186.7 | 173.7 | 168.0 | 182.1 | 215.7 | 257.5 | 303.8 | 341.0 | 234.1 | 208.9 | 136.7 | 399 0 | 251.3 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | 0.0 | 0.0 | 0.0 | 0.0002 | 0.0004 | 0 001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.003 | 0.003 | 0.004 | 0.004 | 0 005 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.0 | 10.1 | 6.5 | 3.6 | 4.1 |
| Misc. Onshore Production Flaring (430 - Permian Basin) | 0.0 | 0.0 | 0.0 | 22.6 | 44.5 | 66.7 | 92.0 | 115.2 | 138.1 | 155.8 | 180.4 | 207.4 | 224.3 | 246.2 | 273.2 | 260.4 | 284.5 | 308.2 | 329.3 | 339.6 | 342.7 | 349.5 | 384.0 | 438.0 | 537.8 | 644.6 | 499.6 | 622.3 | 707.1 | 1,159.4 | 591.2 |
| Misc. Onshore Production Flaring (Other Basins) | 0.0 | 0.0 | 0.0 | 7.1 | 14.8 | 22.6 | 30.7 | 38.7 | 46 2 | 53.0 | 63.0 | 71.6 | 80.9 | 91.7 | 104.1 | 117.1 | 129.2 | 149.4 | 174.7 | 192 9 | 215.8 | 250.5 | 275.7 | 291.2 | 316.3 | 344.2 | 427.2 | 303.6 | 493.5 | 342 0 | 213.5 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | 291.8 | 286.2 | 277.5 | 290.3 | 303.4 | 271.5 | 293.0 | 303.4 | 313 9 | 336.7 | 311.2 | 349.8 | 364.2 | 356.6 | 345.5 | 366.6 | 411.4 | 413.6 | 446.3 | 445 3 | 611.9 | 672.8 | 825.0 | 991.4 | 1,037.5 | 1,048.1 | 1,107.1 | 1,085.2 | 779.0 | 573 5 | 552.1 |
| Large Tanks w/VRU | 0.0 | 0.05 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.7 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.1 | 1.6 | 1.8 | 2.2 | 2.7 | 2.8 | 2.8 | 2.5 | 0.10 | 0.0 | 0 0 | 0.0 |
| Large Tanks w/o Control | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0 5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0 3 | 0.4 | 0.4 | 0.5 | 0.6 | 0.6 | 0.6 | 0.9 | 0.5 | 7.9 | 0 2 | 0.3 |
| Small Tanks w/Flares | 0.0 | 0.510 | 0.973 | 1.50 | 2 06 | 2.27 | 2.89 | 3.44 | 4.01 | 4.76 | 4.82 | 5.87 | 6.58 | 6.88 | 7.08 | 7 94 | 9.37 | 9.88 | 11.14 | 11.58 | 16.5 | 18.8 | 23.1 | 27.8 | 29.1 | 29.4 | 29.2 | 35.2 | 47.7 | 50 8 | 13.9 |
| Small Tanks w/o Flares | 5.8 | 5.5 | 5.1 | 5.2 | 5.3 | 4.5 | 4.8 | 4.8 | 4 8 | 4.9 | 4.4 | 4.8 | 4.8 | 4.6 | 4.3 | 4.4 | 4.8 | 4.6 | 4.8 | 4.7 | 6.2 | 6.6 | 8.0 | 9.7 | 10.1 | 10.2 | 13.1 | 9.4 | 9.3 | 9.6 | 7.2 |
| Malfunctioning Separator Dump Valves | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0 007 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 1.1 | 0.2 | 0 0 | 0.4 |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Well Clean Ups*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | 0.0 | 0.5 | 0.9 | 1.4 | 2.0 | 2.4 | 3.0 | 3.8 | 4.4 | 5.0 | 5.7 | 6.9 | 7.7 | 8.9 | 9.9 | 11.2 | 12.8 | 14.3 | 16.2 | 17.4 | 18.7 | 19.9 | 24.9 | 5.6 | 3.7 | 2.7 | 2.9 | 3.2 | 3.8 | 2 8 | 2.5 |
| Liquids Unloading without Plunger Lifts | 83.2 | 89.1 | 83.5 | 82.1 | 81.8 | 75.8 | 76.0 | 75.9 | 73 8 | 69.4 | 66.6 | 67.5 | 64.3 | 62.2 | 58.8 | 55.8 | 53.0 | 48.5 | 44.5 | 37.4 | 30.3 | 22.8 | 34.7 | 7.4 | 7.9 | 5.0 | 3.6 | 4.3 | 5.4 | 5 5 | 3.0 |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | 0.03 | 0.03 | 0.03 | 0.03 | 0 03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 |
| Compressor BD | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 |
| Compressor Starts | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0 4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0 6 | 0.6 |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | 0.03 | 0.04 | 0.04 | 0.04 | 0 04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 | 0 1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters Vent/Leak - Major Com | 1.5 | 1.6 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 | 1.6 | 1.5 | 1.6 | 1.6 | 1.6 | 1.5 | 1.5 | 0.3 | 1.5 | 1.3 | 1.2 | 1.1 | 0.7 | 0.6 | 0.5 | 0.3 | 0.2 | 0.2 | 0.7 | 0.5 | 0.5 | 0 5 | 0.6 |
| GOM Federal Waters Vent/Leak - Minor Com | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0 3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0 02 | 0.01 | 0.01 | 0.01 | 0.02 |
| GOM Federal Waters Flaring | 45.4 | 43.5 | 32.1 | 32.1 | 32.9 | 38.9 | 48.0 | 60.8 | 62 3 | 47.0 | 40.3 | 40.4 | 41.5 | 30.6 | 32.4 | 35.6 | 28.9 | 31.5 | 70.9 | 67.7 | 90.6 | 86.5 | 62.5 | 44.7 | 50.4 | 35.9 | 29.4 | 24.0 | 23.6 | 25 5 | 27.0 |
| GOM State Waters Vent/Leak | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.4 | 0.3 | 0.3 | 0.1 | 0.4 | 0.3 | 0.4 | 0 3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0 2 | 0.2 | 0.3 | 0 4 | 0.5 |
| GOM State Waters Flaring | 4.2 | 3.6 | 3.5 | 4.0 | 5.6 | 6.2 | 8.2 | 11.1 | 11 2 | 8.0 | 6.4 | 6.9 | 7.7 | 5.0 | 4.9 | 6.2 | 5.7 | 6.0 | 17.2 | 14 3 | 19.5 | 20.8 | 21.6 | 16.9 | 20.8 | 11.7 | 10.1 | 9.5 | 14.2 | 17 0 | 24.5 |
| Alaska State Waters Vent/Leak | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.005 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.003 | 0.003 | 0.002 | 0.002 | 0.0000 | 0.0 | 0 0003 | 0.0000 |
| Alaska State Waters Flaring | 19.8 | 21.1 | 23.1 | 22.1 | 20.9 | 21.9 | 24.9 | 24.3 | 26 2 | 24.9 | 24.1 | 23.9 | 21.6 | 17.8 | 15.4 | 15.7 | 13.0 | 10.2 | 9.4 | 9 3 | 8.7 | 7.7 | 6.9 | 5.7 | 4.7 | 3.4 | 2.6 | 3.5 | 1.9 | 1 8 | 1.6 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressors | 15.5 | 16.1 | 16.6 | 17.0 | 17.5 | 17.8 | 18.3 | 18.4 | 18 3 | 18.0 | 18.6 | 18.8 | 18.7 | 19.0 | 19.5 | 19.7 | 20.1 | 21.2 | 22.8 | 23.1 | 23.9 | 25.9 | 27.3 | 28.1 | 29.7 | 31.3 | 31.2 | 33.4 | 35.5 | 36.4 | 36.6 |
| Tanks | 412.2 | 428.0 | 440.4 | 451.1 | 465.4 | 474.0 | 487.3 | 489.0 | 487 3 | 477.4 | 495.0 | 499.1 | 497.2 | 505.2 | 519.5 | 524.6 | 533.6 | 564.2 | 605.0 | 613.6 | 635.1 | 688.7 | 727.2 | 746.0 | 789.1 | 832.6 | 822.4 | 681.9 | 669.1 | 841 5 | 941.6 |
| Station Blowdowns | 1.6 | 1.6 | 1.7 | 1.7 | 1.8 | 1.8 | 1.9 | 1.9 | 1 9 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.2 | 2.3 | 2 3 | 2.4 | 2.6 | 2.8 | 2.9 | 3.0 | 3.2 | 3.2 | 3.2 | 4.9 | 9 4 | 4.4 |
| Dehy Vents - Large units | 371.0 | 385.2 | 396.4 | 406.0 | 419.0 | 426.7 | 438.7 | 440.2 | 438.7 | 429.7 | 445.6 | 449.3 | 447.6 | 454.7 | 467.7 | 472.2 | 480.3 | 507.9 | 544.6 | 552.4 | 571.7 | 620.0 | 654.6 | 671.6 | 710.3 | 749.5 | 745.5 | 771.5 | 820.1 | 906.7 | 267.4 |
| Dehy Vents - Small units | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0 4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 | 0 5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 1.3 | 1.2 | 2 9 | 2.6 |
| High-bleed Pneumatic Devices | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 | 1 4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 | 1.6 | 1.7 | 1 7 | 1.8 | 2.0 | 2.1 | 2.1 | 2.2 | 2.4 | 2.3 | 2.2 | 1.8 | 1 6 | 1.4 |
| Intermittent Bleed Pneumatic Devices | 5.3 | 5.5 | 5.7 | 5.8 | 6.0 | 6.1 | 6.3 | 6.3 | 6 3 | 6.2 | 6.4 | 6.5 | 6.4 | 6.5 | 6.7 | 6.8 | 6.9 | 7.3 | 7.8 | 8 0 | 8.2 | 8.9 | 9.4 | 9.7 | 10.2 | 10.8 | 10.7 | 14.7 | 14.3 | 13.6 | 12.5 |
| Low-Bleed Pneumatic Devices | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0 4 | 0.4 |
| Flare Stacks | 1,355.2 | 1,407.0 | 1,447.9 | 1,483.0 | 1,530.2 | 1,558.5 | 1,602.2 | 1,607.8 | 1,602 2 | 1,569.5 | 1,627.4 | 1,640.9 | 1,634.6 | 1,660.9 | 1,708.0 | 1,724.7 | 1,754.3 | 1,855.0 | 1,989.2 | 2,017.4 | 2,088.0 | 2,264.4 | 2,390.7 | 2,452.8 | 2,594.3 | 2,737.3 | 2,704.7 | 2,255.9 | 3,695.0 | 5,028.1 | 2,925.8 |
| AGRU | 244.7 | 254.1 | 261.5 | 267.8 | 276.3 | 281.5 | 289.3 | 290.4 | 289 3 | 283.4 | 293.9 | 296.3 | 295.2 | 299.9 | 308.5 | 311.5 | 316.8 | 335.0 | 359.2 | 364 3 | 377.1 | 408.9 | 431.7 | 442.9 | 468.5 | 494.3 | 492.0 | 529.1 | 706.6 | 1,163 5 | 1,630.3 |
| Pneumatic Pumps | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1 1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.4 | 1 4 | 1.5 | 1 6 | 1.7 | 1.7 | 1.8 | 1.9 | 1.9 | 1.7 | 1.7 | 1 8 | 1.9 |
| Combustion Slip | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 |
| Dehydrator L&V | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 3 | 0.1 |
| Yard Piping | 4.4 | 4.6 | 4.7 | 4.9 | 5.0 | 5.1 | 5.2 | 5.3 | 5 2 | 5.1 | 5.3 | 5.4 | 5.3 | 5.4 | 5.6 | 5.6 | 5.7 | 6.1 | 6.5 | 6.6 | 6.8 | 7.4 | 7.8 | 8.0 | 8.5 | 9.0 | 8.9 | 9.2 | 10.4 | 11 4 | 11.2 |
| Separators | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 | 0 1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0 2 | 0.2 |
| Desiccant Dehydrators | 0.0001 | 0 0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0 0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0 0001 | 0.0002 | 0.0002 | 0 0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0004 | 0.00003 | 0.00001 | 0.00008 |
| G&B Pipeline Leaks | 9.7 | 10.1 | 10.1 | 10.2 | 10.5 | 10.3 | 10.6 | 10.9 | 11.1 | 11.2 | 11.5 | 12.2 | 12.6 | 13.2 | 13.7 | 14.3 | 15.1 | 15.8 | 16.6 | 16 9 | 17.0 | 17.2 | 17.2 | 17.0 | 16.8 | 16.8 | 16.5 | 15.9 | 16.4 | 15 8 | 27.9 |
| G&B Pipeline Blowdowns | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0 5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0 8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.4 | 0 5 | 0.6 |
| **GAS PROCESSING PLANTS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **28,338** | **27

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Turbines (Storage) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Generators (Engines) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Generators (Turbines) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Pneumatic Devices Trans + Stor*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Devices Transmission | 6.3 | 6.3 | 6.3 | 6.1 | 5.9 | 5.7 | 5.5 | 5.4 | 5 2 | 5.0 | 4.8 | 4.7 | 4.5 | 4.3 | 4.2 | 4.0 | 3.9 | 3.7 | 3.5 | 3.4 | 3.2 | 3.1 | 2.9 | 3.0 | 0.9 | 0.8 | 0.7 | 1.1 | 1.0 | 1.1 | 1.0 |
| (High Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 0.7 | 0.4 | 0.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 |
| (Intermittent Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 2.4 | 2.6 | 2.6 | 0.5 | 0.4 | 0.4 | 0.8 | 0.7 | 0.7 | 0.7 |
| (Low Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.03 | 0.02 | 0.02 |
| Pneumatic Devices Storage | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.3 | 1 3 | 1.3 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1 0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.6 | 1.0 | 1.0 | 0.8 | 0 8 | 0.6 |
| (High Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 0.8 | 0.8 | 0.8 | 0.8 | 0.4 | 0.63 | 0.6 | 0.5 | 0 5 | 0.3 |
| (Intermittent Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0 32 | 0.4 | 0.3 | 0 3 | 0.3 |
| (Low Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 |
| ***Routine Maintenance/Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pipeline venting | 5.2 | 5.3 | 5.2 | 5.3 | 5.4 | 5.3 | 5.1 | 5.3 | 5.4 | 5.3 | 5.4 | 5.2 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5 5 | 5.5 | 5.5 | 5.4 | 5.4 | 5.4 | 5.4 | 7.5 | 6.0 | 6.4 | 5 5 | 6.4 |
| ***Station venting Trans + Storage*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Venting Transmission | 4.3 | 4.3 | 4.3 | 4.2 | 4.2 | 4.2 | 4.1 | 4.1 | 4.1 | 4.1 | 4.0 | 4.0 | 4.0 | 3.9 | 3.9 | 3.9 | 3.8 | 3.8 | 3.8 | 3.7 | 3.7 | 3.7 | 3.9 | 4.2 | 4.6 | 4.6 | 4.6 | 4.7 | 5.0 | 5 5 | 5.6 |
| Station Venting Storage | 0.9 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0 9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.8 | 0.9 | 0.8 | 0.9 | 0 9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0 86 | 0.9 | 0.8 | 0 9 | 0.9 |
| ***LNG Storage*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LNG Stations (eq. leaks, compressors, flares) | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1 5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.4 | 1.5 | 0.01 | 0.00 | 4.33 |
| LNG Station Blowdowns | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 |
| LNG Station Engine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| LNG Station Turbine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***LNG Import/Export Terminals*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| LNG Import Terminals (eq. leaks, compressors, flares) | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 | 14 8 | 14.8 | 14.8 | 22.2 | 22.2 | 29.6 | 29.6 | 37.0 | 37.0 | 37.0 | 59.1 | 66 5 | 81.3 | 88.7 | 88.7 | 81.3 | 81.3 | 81.3 | 81.3 | 81.3 | 24.0 | 17.4 | 3.3 |
| LNG Import Terminal Blowdowns | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.4 | 0 5 | 0.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0 0 | 0.0 |
| LNG Import Terminal Engine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| LNG Import Terminal Turbine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| LNG Export Terminals (eq. leaks, compressors, flares) | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 97.9 | 278.0 | 327.5 | 979.1 | 1,752.0 |
| LNG Export Terminal Blowdowns | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.002 | 0.0 | 0 0001 | 0.0026 | 0.0007 |
| LNG Export Terminal Engine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| LNG Export Terminal Turbine Exhaust | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| **DISTRIBUTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **53.6** | **52.8** | **51.6** | **51.0** | **51.4** | **47.7** | **45.1** | **44.0** | **42.6** | **40.2** | **38.5** | **37.0** | **35.3** | **32.8** | **31.6** | **30.1** | **28.6** | **24.1** | **22.9** | **21.0** | **19.0** | **17.5** | **17.4** | **17.2** | **17.1** | **16.9** | **16.9** | **16.8** | **16.6** | **16.5** | **16.4** |
| ***Pipeline Leaks*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mains - Cast Iron | 7.9 | 7.6 | 7.2 | 7.0 | 7.3 | 6.0 | 5.9 | 5.3 | 4 9 | 4.5 | 4.1 | 3.9 | 3.4 | 3.2 | 2.9 | 2.6 | 2.4 | 2.1 | 1.8 | 1.6 | 1.4 | 1.1 | 1.1 | 1.1 | 1.0 | 0.9 | 0.9 | 0.8 | 0.8 | 0.7 | 0.7 |
| Mains - Unprotected steel | 6.8 | 6.4 | 6.2 | 6.0 | 5.8 | 5.3 | 4.8 | 4.6 | 4.4 | 4.1 | 3.9 | 3.6 | 3.4 | 3.0 | 3.0 | 2.7 | 2.5 | 2.4 | 2.2 | 2 0 | 1.8 | 1.6 | 1.6 | 1.5 | 1.5 | 1.4 | 1.5 | 1.4 | 1.3 | 1 3 | 1.2 |
| Mains - Protected steel | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1 0 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.3 | 1 3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 | 1 3 | 1.3 |
| Mains - Plastic | 1.7 | 1.4 | 1.5 | 1.6 | 1.7 | 1.7 | 1.6 | 1.8 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.4 | 1.4 | 1.3 | 1.2 | 1.1 | 1.0 | 0 8 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 |
| Services - Unprotected steel | 7.4 | 6.9 | 6.9 | 6.5 | 5.9 | 5.4 | 4.9 | 4.6 | 4 3 | 4.4 | 4.2 | 3.9 | 3.5 | 3.2 | 3.0 | 3.3 | 3.2 | 2.9 | 2.8 | 2 5 | 1.9 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.4 | 1.3 | 1.2 | 1 2 | 1.1 |
| Services - Protected steel | 2.0 | 2.3 | 2.0 | 1.9 | 2.0 | 1.9 | 1.6 | 1.7 | 1 5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 | 0.9 | 0.8 | 0.8 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0 5 | 0.5 |
| Services - Plastic | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Services - Copper | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| ***Meter/Regulator (City Gates)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M&R >300 | 4.1 | 4.2 | 4.1 | 4.1 | 4.2 | 3.9 | 3.6 | 3.5 | 3.4 | 3.1 | 2.9 | 2.8 | 2.6 | 2.3 | 2.1 | 1.9 | 1.7 | 0.9 | 0.8 | 0.6 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 |
| M&R 100-300 | 8.0 | 8.1 | 8.0 | 8.0 | 8.1 | 7.5 | 7.1 | 6.8 | 6.6 | 6.0 | 5.6 | 5.3 | 5.0 | 4.4 | 4.1 | 3.6 | 3.2 | 1.8 | 1.5 | 1.1 | 0.8 | 0.4 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| M&R <100 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 |
| Reg >300 | 4.1 | 4.1 | 4.0 | 4.0 | 4.1 | 3.8 | 3.6 | 3.4 | 3 3 | 3.0 | 2.8 | 2.6 | 2.5 | 2.2 | 2.0 | 1.7 | 1.5 | 0.8 | 0.7 | 0 5 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 |
| R-Vault >300 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.004 | 0.003 | 0.003 | 0.002 | 0.002 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Reg 100-300 | 3.1 | 3.1 | 3.1 | 3.0 | 3.1 | 2.9 | 2.7 | 2.6 | 2 5 | 2.2 | 2.1 | 2.0 | 1.8 | 1.6 | 1.5 | 1.3 | 1.1 | 0.6 | 0.5 | 0 3 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0 1 | 0.1 |
| R-Vault 100-300 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Reg 40-100 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0 3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0 2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0 2 | 0.2 |
| R-Vault 40-100 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.03 | 0.03 | 0.03 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.04 | 0.05 | 0.05 | 0.1 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 | 0 02 | 0.02 | 0.01 | 0.01 | 0.01 |
| Reg <40 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0 01 | 0.01 | 0.01 | 0.01 | 0.01 |
| ***Customer Meters*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | 1.7 | 1.8 | 1.8 | 1.8 | 1.8 | 1.9 | 1.9 | 1.9 | 2 0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2 3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.3 | 2.4 | 2.4 | 2.4 | 2.4 | 2 5 | 2.5 |
| Commercial | 2.9 | 3.0 | 3.0 | 3.1 | 3.1 | 3.2 | 3.3 | 3.3 | 3 5 | 3.5 | 3.5 | 3.4 | 3.5 | 3.5 | 3.5 | 3.6 | 3.6 | 3.7 | 3.8 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.8 | 3.8 | 3.8 | 3.8 | 3 8 | 3.9 |
| Industrial | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| ***Routine Maintenance*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valve Releases | 0.03 | 0.03 | 0.03 | 0.03 | 0 03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0 03 | 0.03 | 0.03 | 0.03 | 0.03 | 0 03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0 04 | 0.04 | 0.04 | 0.04 | 0.04 |
| Pipeline Blowdown | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mishaps (Dig-ins) | 1.4 | 1.4 | 1.4 | 1.5 | 1.6 | 1.5 | 1.5 | 1.6 | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.8 | 1.8 | 1.8 | 1.9 | 1 9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.1 |
| **OTHER** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | 1.2143 | 1 2348 | 1.2804 | 1.3009 | 1.3472 | 1.4258 | 1.4165 | 1.4447 | 1.4823 | 1.4715 | 1.5203 | 1.4549 | 1 5045 | 1.4229 | 1.4609 | 1.4407 | 1.4721 | 1.551 | 1.5401 | 1.5134 | 1.6233 | 1.6605 | 1.8339 | 1.7752 | 1.7957 | 1.9286 | 1.9805 | 1.9383 | 2.1167 | 2.19504 | 2.20163 |
| ***Post-Meter*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Commercial | 0.1398 | 0.1438 | 0.1455 | 0.1473 | 0.1496 | 0.153 | 0.1558 | 0.1571 | 0.1665 | 0.1653 | 0.1654 | 0.1649 | 0.1671 | 0.17 | 0.1696 | 0.1715 | 0.174 | 0.1752 | 0.1797 | 0.1756 | 0.175 | 0.1756 | 0.1768 | 0.1773 | 0.1786 | 0.18 | 0.1807 | 0.1815 | 0.1821 | 0.1832 | 0.18569 |
| Industrial & Power Plants | 1.0745 | 1 0911 | 1.1349 | 1.1535 | 1.1975 | 1.2727 | 1.2607 | 1.2875 | 1.3158 | 1.3061 | 1.3549 | 1.29 | 1 3374 | 1.2529 | 1.2912 | 1.2691 | 1 298 | 1 3757 | 1.3604 | 1.3376 | 1.4483 | 1.4849 | 1.657 | 1 5978 | 1.617 | 1.7485 | 1.7996 | 1.7566 | 1.9344 | 2.01161 | 2.0157 |
| Natural Gas Vehicles | 1E-08 | 3E-06 | 5E-06 | 8E-06 | 1E-05 | 1E-05 | 2E-05 | 2E-05 | 2E-05 | 2E-05 | 3E-05 | 4E-05 | 4E-05 | 5E-05 | 5E-05 | 5E-05 | 6E-05 | 6E-05 | 6E-05 | 7E-05 | 7E-05 | 8E-05 | 9E-05 | 1E-04 | 0.0001 | 0.0001 | 0.0002 | 0.0002 | 0 0002 | 0.00023 | 0.00025 |

**Table 3.6-11: Default Gas Content by Segment, for All Years**

| Segment | $CH_4$ Content | $CO_2$ Content | | |
|---|---|---|---|---|
| | | Conventional | Non-conventional | All types |
| Production – North East region | 78.8% | 0.92% | 7.42% | 3.04% |
| Production – Mid Central region | 78.8% | 0.79% | 0.31% | 0.79% |
| Production – Gulf Coast region | 78.8% | 2.17% | 0.23% | 2.17% |
| Production – South West region | 78.8% | 3.81% | NA | 3.81% |
| Production – Rocky Mountain region | 78.8% | 7.95% | 0.64% | 7.58% |
| Production – West Coast region | 78.8% | 0.16% | NA | 0.16% |
| Production – Lower-48 States | 78.8% | 3.41% | 4.83% | 3.45% |
| Processing – Before $CO_2$ removal | 87% | 3.45% | 3.45% | 3.45% |
| Processing – After $CO_2$ removal | 87% | 1.0% | 1.0% | 1.0% |
| Transmission and Underground NG Storage | 93.4% | 1.0% | 1.0% | 1.0% |
| LNG Storage and LNG Import/Export | 93.4% | 1.16% | 1.16% | 1.16% |
| Distribution | 93.4% | 1.0% | 1.0% | 1.0% |

**Table 3.6-12: Average CO2 Emission Factors (kg/unit activity) for Natural Gas Systems Sources, for All Years**

Average emission factors for each emission source in this table equal national emissions (from Table 3.6-10) divided by national activity data (from Table 3.6-7).

**Table Footnotes:**

"NA" indicates value not applicable

| Segment/Source | Units | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-completion well testing - vented | kg/event | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 165.9 | 99.8 | 50.3 | NA | NA | NA | 100.0 |
| Non-completion well testing - flared | kg/event | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 296,045.2 | 36,514.3 | 1,808,851.2 | 9,232.4 | NA |
| HF Completions - Non-REC with Venting | kg/event | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 1,131.1 | 5,515.2 | 1,100.8 | 1,527.3 | 323.3 | 4,160.5 | 342.3 | 249.1 | 29.4 |
| HF Completions - Non-REC with Flaring | kg/event | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 675,893.7 | 455,532.9 | 687,951.9 | 149,454.6 | 89,037.8 | 228,098.5 | 356,317.0 | 266,034.8 | 247,908.2 |
| HF Completions - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 369.8 | 620.2 | 91.8 | 189.0 | 87.2 | 183.3 | 902.0 | 85.5 | 73.3 |
| HF Completions - REC with Flaring | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 396,264.0 | 462,066.8 | 168,691.3 | 124,211.4 | 196,011.7 | 510,060.1 | 190,716.8 | 181,749.2 | 173,794.7 |
| Non-HF Completions - vented | kg/event | 513.3 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 | 513.4 |
| Non-HF Completions - flared | kg/event | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 432,744.4 | 9,233.3 | 332,725.0 | 421,900.0 | 31,240.1 | 23,420.0 | 22,825.1 | 134,664.0 | 5,200.0 | NA |
| Well Drilling | kg/well | 5.2 | 5.1 | 5.4 | 5.1 | 5.2 | 4.9 | 5.1 | 5.2 | 5.8 | 6.8 | 7.2 | 7.2 | 6.5 | 6.3 | 6.3 | 6.4 | 6.1 | 6.0 | 5.8 | 5.6 | 6.0 | 5.9 | 5.7 | 5.4 | 5.4 | 5.8 | 6.3 | 6.7 | 6.7 | 6.7 | 6.7 |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wells) | kg/well | 13.6 | 13.2 | 13.4 | 13.3 | 13.5 | 13.3 | 12.8 | 12.5 | 12.4 | 12.8 | 13.4 | 13.1 | 13.2 | 13.2 | 13.4 | 13.5 | 13.4 | 13.4 | 13.1 | 13.2 | 13.1 | 13.0 | 13.0 | 13.0 | 13.1 | 13.0 | 13.0 | 12.9 | 12.9 | 13.0 | 13.5 |
| Gas Wells with Hydraulic Fracturing | kg/well | 6.0 | 7.3 | 6.9 | 7.0 | 7.2 | 7.0 | 7.2 | 7.4 | 7.3 | 7.2 | 7.1 | 7.1 | 6.9 | 6.8 | 6.5 | 6.4 | 6.2 | 6.0 | 6.0 | 5.9 | 6.0 | 5.9 | 6.0 | 6.0 | 6.0 | 6.1 | 6.2 | 6.2 | 6.3 | 6.3 | 6.3 |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | kg/heater | 39.3 | 39.2 | 39.6 | 39.1 | 38.5 | 39.1 | 37.9 | 37.2 | 36.6 | 36.9 | 37.2 | 36.0 | 36.0 | 35.4 | 35.8 | 35.4 | 35.2 | 35.6 | 34.8 | 35.1 | 34.0 | 33.9 | 33.7 | 33.4 | 33.4 | 33.1 | 32.9 | 32.7 | 32.9 | 32.9 | 33.4 |
| Separators | kg/separator | 53.4 | 48.8 | 49.6 | 48.9 | 49.5 | 48.8 | 46.6 | 45.5 | 45.7 | 46.9 | 51.2 | 53.0 | 56.5 | 57.7 | 59.7 | 61.6 | 62.7 | 64.2 | 63.6 | 64.0 | 62.8 | 62.7 | 62.2 | 61.6 | 61.3 | 60.4 | 60.0 | 59.4 | 59.7 | 59.8 | 60.8 |
| Dehydrators | kg/dehydrator | 51.3 | 48.2 | 49.3 | 49.7 | 50.4 | 51.3 | 52.1 | 52.3 | 52.2 | 51.7 | 52.3 | 51.8 | 52.0 | 51.9 | 51.9 | 51.9 | 52.5 | 52.5 | 54.2 | 54.4 | 55.4 | 55.0 | 55.0 | 55.0 | 54.5 | 54.2 | 54.0 | 54.0 | 54.1 | 54.8 | 54.8 |
| Meters/Piping | kg/meter | 33.5 | 33.4 | 33.6 | 32.9 | 32.7 | 32.9 | 31.1 | 29.8 | 29.5 | 29.8 | 30.8 | 30.0 | 30.8 | 30.5 | 31.1 | 31.1 | 31.0 | 31.4 | 30.6 | 30.8 | 30.0 | 29.9 | 29.7 | 29.4 | 29.3 | 29.0 | 28.9 | 28.6 | 28.8 | 28.8 | 29.3 |
| Compressors | kg/compressor | 176.6 | 177.2 | 179.2 | 178.5 | 180.1 | 180.8 | 182.0 | 186.4 | 182.4 | 187.5 | 193.0 | 199.5 | 202.3 | 205.1 | 207.5 | 211.6 | 216.0 | 220.4 | 223.0 | 223.0 | 218.8 | 219.9 | 219.9 | 219.3 | 218.9 | 219.1 | 219.2 | 219.0 | 220.3 | 220.8 | 222.6 |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | kg/event | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 2,999.3 | 1,131.1 | 5,515.2 | 1,100.8 | 1,527.3 | 323.3 | 4,160.5 | 342.3 | 249.1 | 29.4 |
| HF Workovers - Non-REC with Flaring | kg/event | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 1,027,527.6 | 675,893.7 | 455,532.9 | 687,951.9 | 149,454.6 | 89,037.8 | 228,098.5 | 356,317.0 | 266,034.8 | 247,908.2 |
| HF Workovers - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 1,640.1 | 369.8 | 620.2 | 91.8 | 189.0 | 87.2 | 183.3 | 902.0 | 85.5 | 73.3 |
| HF Workovers - REC with Flaring | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 592,277.6 | 396,264.0 | 462,066.8 | 168,691.3 | 124,211.4 | 196,011.7 | 510,060.1 | 190,716.8 | 181,749.2 | 173,794.7 |
| Non-HF Workovers - vented | kg/event | 5.3 | 5.3 | 5.4 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 4.5 | 3.6 | 4.0 | 3.5 | 4.0 | 4.0 |
| Non-HF Workovers - flared | kg/event | NA | NA | NA | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 81,304.9 | 880.4 | 10,916.9 | 760.0 | 9,377.1 | 9,282.8 | 986.9 | 252.4 | 1,463.6 | 196.9 |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | kg/MMbbl produced water | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | kg/controller | 239.7 | 239.7 | 239.7 | 214.3 | 228.8 | 223.3 | 217.8 | 212.4 | 206.9 | 201.4 | 195.9 | 190.4 | 185.0 | 179.5 | 174.0 | 168.5 | 163.1 | 157.6 | 152.1 | 146.6 | 141.1 | 135.7 | 141.2 | 150.8 | 142.4 | 141.5 | 140.6 | 138.6 | 138.0 | 137.9 | 135.3 |
| (Low Bleed) | kg/controller | NA | NA | NA | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| (High Bleed) | kg/controller | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 | 359.8 |
| (Intermittent Bleed) | kg/controller | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 | 175.1 |
| Chemical Injection Pumps | kg/pump | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 | 146.0 |
| Kimray Pumps | kg/pump | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.1 | 2.1 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 | 2.2 |
| Dehydrator Vents | kg/MMscf | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | kg/MMscf | 0.0 | 0.0 | 0.0 | 4.376 | 8.751 | 13.127 | 17.503 | 21.879 | 26.254 | 30.630 | 35.006 | 39.382 | 43.757 | 48.133 | 52.5 | 56.9 | 61.3 | 65.6 | 70.0 | 74.4 | 78.8 | 83.1 | 87.5 | 91.9 | 96.3 | 100.6 | 78.0 | 73.8 | 46.4 | 131.0 | 93.6 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 2.62E-03 | 5.24E-03 | 7.86E-03 | 1.05E-02 | 1.31E-02 | 1.57E-02 | 1.83E-02 | 2.10E-02 | 2.36E-02 | 2.62E-02 | 2.88E-02 | 3.15E-02 | 3.41E-02 | 3.67E-02 | 3.93E-02 | 4.19E-02 | 4.46E-02 | 4.72E-02 | 4.98E-02 | 5.24E-02 | 5.50E-02 | 5.77E-02 | 6.03E-02 | 0.00E+00 | 1.37E-01 | 7.18E+00 | 3.25E+00 | 3.98E+00 |
| Misc. Onshore Production Flaring (630 - Permian Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 11.81 | 23.62 | 35.43 | 47.24 | 59.1 | 70.9 | 82.7 | 94.5 | 106.3 | 118.1 | 129.9 | 141.7 | 153.5 | 165.3 | 177.2 | 189.0 | 200.8 | 212.6 | 224.4 | 236.2 | 248.0 | 259.8 | 271.6 | 193.9 | 202.1 | 170.5 | 212.7 | 98.4 |
| Misc. Onshore Production Flaring (Other Basins) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0.6 | 1.2 | 1.8 | 2.4 | 3.0 | 3.6 | 4.2 | 4.8 | 5.4 | 6.0 | 6.6 | 7.2 | 7.8 | 8.4 | 9.0 | 9.6 | 10.2 | 10.8 | 11.4 | 12.1 | 12.7 | 13.3 | 13.9 | 17.2 | 11.9 | 17.5 | 11.4 | 7.2 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | kg/bbl | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 10.3 | 10.8 | 6.0 | 3.7 |
| Large Tanks w/VRU | kg/bbl | NA | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.005 | 0.002 | 0.001 | 0.000 |
| Large Tanks w/o Control | kg/bbl | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| Small Tanks w/Flares | kg/bbl | NA | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 4.1 | 4.9 | 6.3 | 6.6 | 0.8 |
| Small Tanks w/o Flares | kg/bbl | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.3 |
| Malfunctioning Separator Dump Valves | kg/bbl | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.00004 | 0.007 | 0.001 | 0.0002 | 0.002 |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Well Clean Ups*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | kg/well | NA | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 412.8 | 553.0 | 136.9 | 90.5 | 58.6 | 74.4 | 108.3 | 104.2 | 82.0 | 68.5 |
| Liquids Unloading without Plunger Lifts | kg/well | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 760.7 | 1,041.1 | 202.6 | 223.0 | 161.6 | 148.7 | 160.4 | 217.6 | 245.1 | 165.0 |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | kg/vessel | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| Compressor BD | kg/compressor | 6.8 | 6.8 | 6.9 | 6.9 | 7.0 | 7.0 | 7.0 | 7.2 | 7.0 | 7.2 | 7.5 | 7.7 | 7.8 | 7.9 | 8.0 | 8.2 | 8.3 | 8.5 | 8.6 | 8.6 | 8.4 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 | 8.5 |
| Compressor Starts | kg/compressor | 15.3 | 15.3 | 15.5 | 15.4 | 15.6 | 15.6 | 15.7 | 16.1 | 15.8 | 16.2 | 16.7 | 17.2 | 17.5 | 17.7 | 17.9 | 18.3 | 18.7 | 19.0 | 19.3 | 19.3 | 18.9 | 19.0 | 19.0 | 18.9 | 18.9 | 18.9 | 18.9 | 18.9 | 19.0 | 19.1 | 19.2 |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | kg/event | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters Vent/Leak - Major Complexes | kg/complex | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 702.1 | 2,940.8 | 2,940.8 | 2,940.8 | 2,940.8 | 2,007.4 | 2,007.4 | 2,007.4 | 1,391.7 | 1,391.7 | 1,391.7 | 6,192.3 | 6,192.3 | 6,192.3 | 6,192.3 | 6,192.3 |
| GOM Federal Waters Vent/Leak - Minor Complexes | kg/complex | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 741.3 | 171.8 | 171.8 | 171.8 | 171.8 | 171.8 |
| GOM Federal Waters Flaring | kg/MMBtu (of flared | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 | 54.7 |
| GOM State Waters Vent/Leak | kg/MMcf | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 1.1 | 1.0 | 1.1 | 1.0 | 0.5 | 1.6 | 1.4 | 1.5 | 1.4 | 1.0 | 1.1 | 1.3 | 1.0 | 1.0 | 0.7 | 2.3 | 2.5 | 4.4 | 4.8 | 7.9 |
| GOM State Waters Flaring | kg/MMcf | 15.7 | 16.4 | 12.0 | 12.4 | 13.1 | 15.7 | 19.5 | 25.5 | 27.3 | 21.1 | 18.9 | 19.0 | 22.3 | 15.6 | 17.9 | 26.1 | 24.2 | 29.9 | 67.2 | 65.1 | 101.4 | 121.0 | 122.4 | 111.9 | 110.6 | 108.7 | 98.6 | 109.7 | 188.7 | 235.7 | 355.7 |
| Alaska State Waters Vent/Leak | kg/MMcf | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.02 | 0.0 | 0.0 | 0.0 |
| Alaska State Waters Flaring | kg/MMcf | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 208.2 | 150.2 | 176.0 | 89.9 | 113.8 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressors | kg/compressor | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 | 1,919.6 |
| Tanks | kg/tank | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,799.5 | 17,666.0 | 14,977.8 | 15,036.4 | 15,737.3 | 21,612.1 |
| Station Blowdowns | kg/well | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.5 | 9.5 | 9.5 | 11.9 | 9.8 |
| Dehy Vents - Large units | kg/dehydrator | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,411 | 252,381 | 237,883 | 244,037 | 244,617 | 267,226 | |
| Dehy Vents - Small units | kg/dehydrator | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 1,284.8 | 2,146.1 | 2,515.1 | 5,804.6 | 5,253.6 |
| High-bleed Pneumatic Devices | kg/device | 338.9 | 338.9 | 338.8 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.8 | 338.9 | 338.9 | 338.9 | 338.9 | 337.7 | 310.7 | 361.8 | 332.2 | 326.3 |
| Intermittent Bleed Pneumatic Devices | kg/device | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.9 | 104.7 | 131.8 | 142.6 | 131.2 | 124.4 |
| Low-Bleed Pneumatic Devices | kg/device | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | 10.5 | 12.4 | 10.9 | 10.4 | |
| Flare Stacks | kg/flare | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 661,343 | 656,579 | 661,327 | 742,535 | 914,794 | 623,158 | |
| AGRU | kg/AGR | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 3,200,482 | 1,515,666 | 4,833,189 | 6,982,982 | 9,538,177 |
| Pneumatic Pumps | kg/pump | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 107.1 | 106.8 | 121.1 | 133.5 | 113.6 | 113.1 |
| Dehydrator L&V | kg/dehydrator | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| Yard Piping | kg/MMscf | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 | 1,513.9 |
| Separators | kg/separator | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1

| Table 3.6-13: CO2 Emission Factors for Natural Gas Systems, Data Sources/Methodology | | |
|---|---|---|
| **Segment/Source** | **Units** | **Data Source(s)/Methodology** |
| **EXPLORATION** | | |
| Non-completion well testing - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Non-completion well testing - flared | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| HF Completions - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Completions - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Completions - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Completions - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| Non-HF Completions - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b for additional detail. |
| Non-HF Completions - flared | kg/event | |
| Well Blowouts | kg/well | n/a |
| Well Drilling | kg/well | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| **PRODUCTION** | | |
| **Gas Wells** | | |
| Total Producing Gas Wells | kg/well | n/a |
| Non-associated Gas Wells (less fractured wells) | kg/well | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Gas Wells with Hydraulic Fracturing | kg/well | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| **Well Pad Equipment** | | |
| Heaters | kg/heater | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Separators | kg/separator | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Dehydrators | kg/dehydrator | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Meters/Piping | kg/meter | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Compressors | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| **Well Workovers** | | |
| HF Workovers - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Workovers - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Workovers - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| HF Workovers - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| Non-HF Workovers - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b,c for additional detail. |
| Non-HF Workovers - flared | kg/event | |
| **Normal Operations** | | |
| Pneumatic Device Vents | kg/controller | Calculated weighted average of bleed type emission factors. |
| Pneumatic Device Vents - Low Bleed (LB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category (EPA 2018a). Refer to EPA 2018c for additional detail. |
| Pneumatic Device Vents - High Bleed (HB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category (EPA 2018a). Refer to EPA 2018c for additional detail. |
| Pneumatic Device Vents - Intermittent Bleed (IB) | kg/controller | Calculated using RY2014 GHGRP subpart W data for each bleed type category (EPA 2018a). Refer to EPA 2018c for additional detail. |
| Chemical Injection Pumps | kg/pump | Calculated using RY2014 GHGRP subpart W data (EPA 2018a). Refer to EPA 2018c for additional detail. |
| Kimray Pumps | kg/MMscf | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Dehydrator Vents | kg/MMscf | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Misc. Onshore Production Flaring (430 - Permian Basin) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Misc. Onshore Production Flaring (Other Basins) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018c for additional detail. |
| **Condensate Tank Vents** | | |
| Large Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Large Tanks w/VRU | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Large Tanks w/o Control | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Small Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Small Tanks w/o Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Malfunctioning Separator Dump Valves | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| **Compressor Exhaust Vented** | | |
| Gas Engines | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| **Well Clean Ups** | | |
| Liquids Unloading with Plunger Lifts | kg/venting well | 2011-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2010: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| Liquids Unloading without Plunger Lifts | kg/venting well | 2011-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2010: Year 2011 emission factors. Refer to EPA 2018b,c for additional detail. |
| **Blowdowns** | | |
| Vessel Blowdowns | kg/vessel | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Compressor Blowdowns | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Compressor Starts | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| **Upsets** | | |
| Pressure Relief Valves | kg/PRV | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| **Produced Water** | | |
| Natural Gas Wells | kg/MMbbl produced water | n/a - Not estimated |
| **Offshore** | | |
| GOM Federal Waters (All sources, except flares) | kg/complex | 1990-2004, 2006-2009: Calculated from year 2008 BOEM data (BOEM 2008). 2005: Calculated from year 2005 BOEM data (BOEM 2005). 2010-2012: Calculated from year 2011 BOEM data (BOEM 2011). 2013-2015: Calculated from year 2014 BOEM data (BOEM 2014). 2016 forward: Calculated from year 2017 BOEM data (BOEM 2017). Refer to EPA 2020a for detail. |
| GOM Federal Waters Flaring | kg/MMBtu (of flared gas) | Calculated from flaring volumes reported in OGOR-B reports (BOEM 2021d). Refer to EPA 2020a for detail. |
| GOM State Waters (All sources, except flares) | kg/MMcf | Equals GOM federal waters emissions divided by GOM federal waters gas production from gas wells (BOEM 2021b, BOEM 2021c), calculated for each year. Refer to EPA 2020a for detail. |

| | | |
|---|---|---|
| GOM State Waters Flaring | kg/MMcf | Equals GOM federal waters emissions divided by GOM federal waters gas production from gas wells (BOEM 2021b, BOEM 2021c), calculated for each year. Refer to EPA 2020a for detail. |
| Alaska State Waters (All sources, except flares) | kg/MMcf | 2015 forward: Calculated using year-specific GHGRP subpart W and subpart C data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2020a for detail. |
| Alaska State Waters Flaring | kg/MMcf | 2015 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2020a for detail. |
| **Gathering and Boosting** | | |
| G&B Stations | | |
| Compressors | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Tanks | kg/tank | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Station Blowdowns | kg/event | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Dehy Vents - Large units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Dehy Vents - Small units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| High-bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Intermittent Bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Low-Bleed Pneumatic Devices | kg/device | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Flare Stacks | kg/flare | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| AGRU | kg/AGRU | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Pneumatic Pumps | kg/pump | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b |
| Dehydrator L&V | kg/dehydrator | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Yard Piping | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Separators | kg/separator | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Desiccant Dehydrators | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| G&B Pipeline Leaks | kg/mile | 2016-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2019a for additional detail. |
| G&B Pipeline Blowdowns | kg/mile | 2016-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2019a for additional detail. |
| **GAS PROCESSING PLANTS** | | |
| Plant Grouped Emission Sources | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Plant Fugitives | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Reciprocating Compressors | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Centrifugal Compressors (wet seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Centrifugal Compressors (dry seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Flares | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Dehydrators | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Compressor Exhaust | | |
| Gas Engines | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Gas Turbines | kg/MMHPhr | |
| AGR Vents | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| Pneumatic Devices | kg/plant | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. |
| Blowdowns/Venting | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2018c for additional detail. |
| **TRANSMISSION AND STORAGE** | | |
| Pipeline Leaks | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Compressor Stations (Transmission)*** | | |
| Station + Compressor Fugitive Emissions | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reciprocating Compressor | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Centrifugal Compressor (total) | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Centrifugal Compressor (wet seals) | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Centrifugal Compressor (dry seals) | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Compressor Stations (Storage)*** | | |
| Station | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reciprocating Compressor | kg/compressor | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Wells (Storage) | kg/well | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| M&R (Trans. Co. Interconnect) | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| M&R (Farm Taps + Direct Sales) | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Normal Operation*** | | |
| Dehydrator vents (Transmission) | kg/MMscf | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Dehydrator vents (Storage) | kg/MMscf | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Flaring (Transmission) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| Flaring (Storage) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018c for additional detail. |
| ***Compressor Exhaust*** | | |
| Engines (Transmission) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Turbines (Transmission) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Engines (Storage) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Turbines (Storage) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Generators (Engines) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Generators (Turbines) | kg/MMHPhr | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| ***Pneumatic Devices Trans + Stor*** | | |
| Pneumatic Devices Transmission | kg/device | 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. 2011-2020: Calculated weighted average of bleed type emission factors. 1993-2010: Linear interpolation. |
| (High Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |
| (Intermittent Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |

| | | |
|---|---|---|
| (Low Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |
| Pneumatic Devices Storage | kg/device | 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. 2011-2020: Calculated weighted average of bleed type emission factors. 1993-2010: Linear interpolation. |
| (High Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |
| (Intermittent Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |
| (Low Bleed) | kg/device | 1990-2010: Not applicable. 2011-2020: Calculated using year-specific GHGRP subpart W data for each bleed type category (EPA 2021c). Refer to EPA 2018c for additional detail. |
| ***Routine Maintenance/Upsets*** | | |
| Pipeline venting | kg/mile | 1990-2015: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. 2016-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). Refer to EPA 2019c for additional detail. |
| ***Station venting Trans + Storage*** | | |
| Station Venting Transmission | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Station Venting Storage | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| **LNG Storage** | | |
| LNG Stations (eq. leaks, compressors, flares) | kg/facility | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Station Blowdowns | kg/facility | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| LNG Station Engine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| LNG Station Turbine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| **LNG Import/Export Terminals** | | |
| LNG Import Terminals (eq. leaks, compressors, flares) | kg/terminal | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Blowdowns | kg/terminal | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Engine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| LNG Import Terminal Turbine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| LNG Export Terminals (eq. leaks, compressors, flares) | kg/terminal | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Blowdowns | kg/terminal | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Engine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| LNG Export Terminal Turbine Exhaust | kg/MMHPhr | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| **DISTRIBUTION** | | |
| ***Pipeline Leaks*** | | |
| Mains - Cast Iron | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Mains - Unprotected steel | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Mains - Protected steel | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Mains - Plastic | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Total Pipeline Miles | kg/mile | N/A |
| Services - Unprotected steel | kg/service | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Services Protected steel | kg/service | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Services - Plastic | kg/service | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Services - Copper | kg/service | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Total Services | kg/service | N/A |
| ***Meter/Regulator (City Gates)*** | | |
| M&R >300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| M&R 100-300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| M&R <100 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reg >300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| R-Vault >300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reg 100-300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| R-Vault 100-300 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reg 40-100 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| R-Vault 40-100 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Reg <40 | kg/station | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Customer Meters*** | | |
| Residential | kg/outdoor meter | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Commercial/Industry | kg/meter | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Rountine Maintenance*** | | |
| Pressure Relief Valve Releases | kg/mile main | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| Pipeline Blowdown | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| ***Upsets*** | | |
| Mishaps (Dig-ins) | kg/mile | [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (EIA 1994)]. |
| **POST-METER** | | |
| Residential | kg/NG house | n/a - Not estimated to avoid double counting with fossil fuel combustion Inventory estimates. |
| Commercial | kg/appliance | IPCC 2019 |
| Industrial & EGUs | kg/BCF | IPCC 2019 |
| Natural Gas Vehicles | kg/vehicle | IPCC 2019 |

## Table 3.6-14: N2O Emissions (kt) for Natural Gas Systems, by Segment and Source, for All Years

**Table Footnotes:**
"NE" indicates value not estimated
"IE" indicates the emissions were included elsehwere (i.e., the emissions are included at an aggregated level)
[a] Plant grouped emission sources include fugitives, compressors, dehydrators, and flares

| Segment/Source | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **1.3E-03** | **1.4E-03** | **1.3E-03** | **1.4E-03** | **1.4E-03** | **1.4E-03** | **1.5E-03** | **1.8E-03** | **1.8E-03** | **1.9E-03** | **2.2E-03** | **2.8E-03** | **2.6E-03** | **3.0E-03** | **3.5E-03** | **4.1E-03** | **4.9E-03** | **5.2E-03** | **5.9E-03** | **4.3E-03** | **4.5E-03** | **5.3E-03** | **3.5E-03** | **3.8E-03** | **2.8E-03** | **1.1E-02** | **3.8E-04** | **8.2E-04** | **5.9E-04** | **3.9E-04** | **1.7E-04** |
| Non-completion well testing - vented | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Non-completion well testing - flared | 7.9E-04 | 8.8E-04 | 8.6E-04 | 8.9E-04 | 9.3E-04 | 9.1E-04 | 9.6E-04 | 1.0E-03 | 1.0E-03 | 1.1E-03 | 1.1E-03 | 1.2E-03 | 1.2E-03 | 1.3E-03 | 1.3E-03 | 1.4E-03 | 1.5E-03 | 1.6E-03 | 1.7E-03 | 1.7E-03 | 1.8E-03 | 1.8E-03 | 1.8E-03 | 1.8E-03 | 1.8E-03 | 1.8E-03 | 2.5E-07 | 4.5E-05 | 1.2E-05 | 9.8E-06 | 0.0E+00 |
| HF Completions - Non-REC with Venting | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| HF Completions - Non-REC with Flaring | 5.4E-04 | 5.4E-04 | 3.9E-04 | 5.0E-04 | 4.9E-04 | 4.7E-04 | 5.4E-04 | 7.7E-04 | 6.9E-04 | 7.9E-04 | 1.1E-03 | 1.5E-03 | 1.2E-03 | 1.5E-03 | 1.7E-03 | 2.1E-03 | 2.5E-03 | 2.6E-03 | 2.9E-03 | 1.7E-03 | 1.7E-03 | 2.3E-03 | 4.5E-04 | 5.8E-04 | 3.9E-04 | 3.4E-04 | 2.4E-05 | 8.5E-05 | 1.1E-04 | 9.1E-05 | 1.7E-05 |
| HF Completions - REC with Venting | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| HF Completions - REC with Flaring | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 8.6E-05 | 1.4E-04 | 2.5E-04 | 4.0E-04 | 6.0E-04 | 8.6E-04 | 1.0E-03 | 1.3E-03 | 8.8E-04 | 1.0E-03 | 1.2E-03 | 1.2E-03 | 1.4E-03 | 6.5E-04 | 7.8E-03 | 3.4E-04 | 6.8E-04 | 3.9E-04 | 2.9E-04 | 1.5E-04 |
| Non-HF Completions - vented | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Non-HF Completions - flared | 8.5E-06 | 9.5E-06 | 9.3E-06 | 9.6E-06 | 1.0E-05 | 9.8E-06 | 1.0E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.2E-05 | 1.3E-05 | 1.3E-05 | 1.4E-05 | 1.5E-05 | 1.5E-05 | 1.6E-05 | 1.7E-05 | 1.8E-05 | 1.9E-05 | 1.9E-05 | 1.9E-05 | 0.0E+00 | 1.3E-05 | 4.7E-06 | 9.6E-04 | 1.8E-05 | 1.2E-05 | 7.6E-05 | 0.0E+00 | 0.0E+00 |
| Well Drilling | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **1.4E-02** | **1.5E-02** | **1.5E-02** | **1.6E-02** | **1.6E-02** | **1.7E-02** | **1.8E-02** | **1.8E-02** | **1.8E-02** | **1.8E-02** | **1.8E-02** | **1.9E-02** | **1.9E-02** | **1.9E-02** | **1.9E-02** | **1.9E-02** | **2.0E-02** | **2.1E-02** | **2.3E-02** | **2.3E-02** | **2.5E-02** | **2.7E-02** | **2.7E-02** | **3.0E-02** | **3.0E-02** | **3.3E-02** | **3.0E-02** | **1.4E-02** | **1.6E-02** | **1.9E-02** | **1.4E-02** |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wells) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Gas Wells with Hydraulic Fracturing | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Separators | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Dehydrators | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Meters/Piping | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Compressors | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| HF Workovers - Non-REC with Flaring | 1.0E-04 | 1.4E-04 | 1.3E-04 | 1.4E-04 | 1.5E-04 | 1.6E-04 | 1.7E-04 | 1.8E-04 | 1.9E-04 | 1.9E-04 | 2.1E-04 | 2.3E-04 | 2.5E-04 | 2.7E-04 | 2.8E-04 | 3.1E-04 | 3.4E-04 | 3.6E-04 | 4.0E-04 | 4.1E-04 | 4.3E-04 | 1.2E-03 | 3.6E-05 | 1.2E-04 | 1.8E-04 | 6.6E-05 | 2.2E-05 | 8.8E-05 | 1.8E-04 | 1.4E-04 | 8.1E-06 |
| HF Workovers - REC with Venting | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| HF Workovers - REC with Flaring | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 2.3E-07 | 4.8E-07 | 7.8E-07 | 1.1E-06 | 1.5E-06 | 2.0E-06 | 2.5E-06 | 3.1E-06 | 3.6E-06 | 4.2E-06 | 4.7E-06 | 1.7E-05 | 8.0E-05 | 6.8E-06 | 1.4E-03 | 8.5E-05 | 5.5E-04 | 1.1E-05 | 3.1E-05 | 5.7E-06 |
| Non-HF Workovers - vented | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Non-HF Workovers - flared | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.9E-07 | 8.1E-07 | 1.2E-06 | 1.6E-06 | 2.1E-06 | 2.6E-06 | 3.0E-06 | 3.4E-06 | 4.2E-06 | 4.7E-06 | 5.4E-06 | 6.1E-06 | 6.7E-06 | 7.6E-06 | 8.4E-06 | 9.4E-06 | 9.9E-06 | 1.1E-05 | 1.1E-05 | 0.0E+00 | 2.0E-03 | 1.2E-06 | 5.9E-05 | 1.2E-06 | 8.7E-08 | 2.1E-07 | 3.4E-07 | 1.2E-08 |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| (Low Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| (High Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| (Intermittent Bleed) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Chemical Injection Pumps | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Kimray Pumps | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Dehydrator Vents | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | 0.0E+00 | 0.0E+00 | 0.0E+00 | 6.1E-05 | 1.2E-04 | 1.9E-04 | 2.7E-04 | 3.3E-04 | 3.9E-04 | 4.5E-04 | 5.3E-04 | 5.9E-04 | 6.1E-04 | 6.5E-04 | 6.9E-04 | 7.2E-04 | 7.5E-04 | 7.8E-04 | 8.1E-04 | 7.5E-04 | 7.3E-04 | 7.9E-04 | 9.3E-04 | 1.1E-03 | 1.3E-03 | 1.5E-03 | 4.6E-04 | 3.2E-04 | 3.1E-04 | 5.5E-04 | 4.3E-04 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 0.0E+00 | 1.4E-05 | 9.4E-06 | 5.2E-06 | 1.0E-05 |
| Misc. Onshore Production Flaring (430 - Permian Basin) | 0.0E+00 | 0.0E+00 | 0.0E+00 | 3.7E-05 | 7.2E-05 | 1.1E-04 | 1.5E-04 | 1.9E-04 | 2.2E-04 | 2.5E-04 | 2.9E-04 | 3.4E-04 | 3.6E-04 | 4.0E-04 | 4.4E-04 | 4.2E-04 | 4.6E-04 | 5.0E-04 | 5.3E-04 | 5.5E-04 | 5.6E-04 | 5.7E-04 | 6.2E-04 | 7.1E-04 | 8.7E-04 | 1.0E-03 | 9.1E-04 | 1.1E-03 | 1.2E-03 | 2.0E-03 | 1.1E-03 |
| Misc. Onshore Production Flaring (Other Basins) | 0.0E+00 | 0.0E+00 | 0.0E+00 | 9.2E-06 | 1.9E-05 | 3.0E-05 | 4.0E-05 | 5.1E-05 | 6.1E-05 | 6.9E-05 | 8.3E-05 | 9.4E-05 | 1.1E-04 | 1.2E-04 | 1.4E-04 | 1.5E-04 | 1.7E-04 | 2.0E-04 | 2.3E-04 | 2.5E-04 | 2.8E-04 | 3.3E-04 | 3.6E-04 | 3.8E-04 | 4.1E-04 | 4.5E-04 | 7.6E-04 | 4.2E-04 | 7.2E-04 | 6.3E-04 | 4.4E-04 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | 4.2E-04 | 4.1E-04 | 4.0E-04 | 4.2E-04 | 4.4E-04 | 3.9E-04 | 4.2E-04 | 4.4E-04 | 4.5E-04 | 4.9E-04 | 4.5E-04 | 5.1E-04 | 5.3E-04 | 5.1E-04 | 5.0E-04 | 5.3E-04 | 5.9E-04 | 6.0E-04 | 6.4E-04 | 6.4E-04 | 8.8E-04 | 9.7E-04 | 1.2E-03 | 1.4E-03 | 1.5E-03 | 1.5E-03 | 1.1E-03 | 1.1E-03 | 9.5E-04 | 6.6E-04 | 5.9E-04 |
| Large Tanks w/VRU | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Large Tanks w/o Control | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Small Tanks w/Flares | 0.0E+00 | 3.4E-06 | 6.6E-06 | 1.0E-05 | 1.4E-05 | 1.5E-05 | 2.0E-05 | 2.3E-05 | 2.7E-05 | 3.2E-05 | 3.3E-05 | 4.0E-05 | 4.4E-05 | 4.6E-05 | 4.8E-05 | 5.4E-05 | 6.3E-05 | 6.7E-05 | 7.5E-05 | 7.8E-05 | 1.1E-04 | 1.3E-04 | 1.6E-04 | 1.9E-04 | 2.0E-04 | 2.0E-04 | 4.2E-05 | 1.4E-04 | 8.1E-05 | 4.9E-05 | 2.0E-05 |
| Small Tanks w/o Flares | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Malfunctioning Separator Dump Valves | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Liquids Unloading*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Liquids Unloading without Plunger Lifts | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Compressor BD | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Compressor Starts | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters, Vent/Leak | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| GOM State Waters, Vent/Leak | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Alaska State Waters, Vent/Leak | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| GOM Federal Waters, Flare | 7.53E-04 | 7.22E-04 | 5.33E-04 | 5.33E-04 | 5.46E-04 | 6.45E-04 | 7.96E-04 | 1.01E-03 | 1.03E-03 | 7.79E-04 | 6.68E-04 | 6.70E-04 | 6.88E-04 | 5.07E-04 | 5.38E-04 | 5.90E-04 | 4.79E-04 | 5.22E-04 | 1.18E-03 | 1.12E-03 | 1.50E-03 | 1.43E-03 | 1.04E-03 | 7.41E-04 | 8.36E-04 | 5.96E-04 | 4.87E-04 | 3.98E-04 | 3.92E-04 | 4.22E-04 | 4.47E-04 |
| GOM State Waters, Flare | 6.94E-05 | 5.91E-05 | 5.87E-05 | 6.66E-05 | 9.31E-05 | 1.03E-04 | 1.36E-04 | 1.85E-04 | 1.86E-04 | 1.33E-04 | 1.07E-04 | 1.15E-04 | 1.27E-04 | 8.28E-05 | 8.10E-05 | 1.03E-04 | 9.47E-05 | 9.90E-05 | 2.84E-04 | 2.36E-04 | 3.24E-04 | 3.45E-04 | 3.59E-04 | 2.80E-04 | 3.46E-04 | 1.93E-04 | 1.68E-04 | 1.57E-04 | 2.36E-04 | 0.0 | 0.0 |
| Alaska State Waters, Flare | 3.47E-04 | 3.70E-04 | 4.05E-04 | 3.87E-04 | 3.66E-04 | 3.84E-04 | 4.37E-04 | 4.25E-04 | 4.59E-04 | 4.36E-04 | 4.22E-04 | 4.20E-04 | 3.78E-04 | 3.12E-04 | 2.69E-04 | 2.75E-04 | 2.28E-04 | 1.79E-04 | 1.65E-04 | 1.62E-04 | 1.53E-04 | 1.35E-04 | 1.21E-04 | 9.96E-05 | 8.31E-05 | 6.04E-05 | 4.60E-05 | 6.39E-05 | 3.33E-05 | 0.0 | 0.0 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanks | 4.79E-04 | 4.98E-04 | 5.12E-04 | 5.25E-04 | 5.41E-04 | 5.51E-04 | 5.67E-04 | 5.69E-04 | 5.67E-04 | 5.55E-04 | 5.76E-04 | 5.81E-04 | 5.78E-04 | 5.88E-04 | 6.04E-04 | 6.10E-04 | 6.21E-04 | 6.56E-04 | 7.04E-04 | 7.14E-04 | 7.39E-04 | 8.01E-04 | 8.46E-04 | 8.68E-04 | 9.18E-04 | 9.69E-04 | 9.65E-04 | 2.25E-03 | 1.22E-03 | 1.20E-03 | 1.46E-03 |
| Dehy Vents - Large units | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.003 | 0.003 | 0.003 | 0.005 |
| Dehy Vents - Small units | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.22E-06 | 1.47E-04 | 8.52E-05 | 8.74E-05 | 3.74E-06 |
| Flare Stacks | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.01 | 0.01 | 0.01 |
| G&B Pipeline Leaks | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| G&B Pipeline Blowdowns | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| **GAS PROCESSING PLANTS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **0.0** | **0.0** | **0.0** | **0.001** | **0.002** | **0.003** | **0.004** | **0.005** | **0.005** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.01** | **0.02** | **0.02** | **0.02** | **0.02** | **0.02** | **0.02** | **0.02** | **0.01** | **0.01** | **0.01** | **0.02** | **0.02** |
| Plant Grouped Emission Sources[a] | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Plant Fugitives | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Recip. Compressors | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Centrifugal Compressors (wet seals) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Centrifugal Compressors (dry seals) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Dehydrators | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Flares | 0.0 | 0.0 | 0.0 | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressor Exhaust | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Gas Turbines | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| AGR Vents | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Pneumatic Devices | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Blowdowns/Venting | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| **TRANSMISSION AND STORAGE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | **8.6E-04** | **8.7E-04** | **8.9E-04** | **9.0E-04** | **9.1E-04** | **9.2E-04** | **9.3E-04** | **9.4E-04** | **9.5E-04** | **9.6E-04** | **9.7E-04** | **9.9E-04** | **1.0E-03** | **1.0E-03** | **1.0E-03** | **1.0E-03** | **1.0E-03** | **1.0E-03** | **1.1E-03** | **1.1E-03** | **1.1E-03** | **1.1E-03** | **1.2E-03** | **1.2E-03** | **1.2E-03** | **1.2E-03** | **1.3E-03** | **1.6E-03** | **7.9E-04** | **2.1E-03** | **3.6E-03** |
| Pipeline Leaks | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Compressor Stations (Transmission)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Total Emissions | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Station + Compressor Fugitive Emissions | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Reciprocating Compressor | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Centrifugal Compressor (wet seals) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Centrifugal Compressor (dry seals) | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| ***Compressor Stations (Storage)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Total Emissions | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Station + Compressor Fugitive Emissions | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Reciprocating Compressor | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE | IE |
| Wells (Storage) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| M&R (Trans. Co. Interconnect) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| M&R (Farm Taps + Direct Sales) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Normal Operation*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dehydrator vents (Transmission) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Dehydrator vents (Storage) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Flaring (Transmission) | 1.4E-04 | 1.4E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.3E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.2E-04 | 1.4E-04 | 4.6E-05 | 7.0E-05 | 9.5E-05 | 1.9E-04 | 2.3E-04 |
| Flaring (Storage) | 4.8E-05 | 5.0E-05 | 5.1E-05 | 5.1E-05 | 5.0E-05 | 5.0E-05 | 4.9E-05 | 4.9E-05 | 4.8E-05 | 4.8E-05 | 4.7E-05 | 4.7E-05 | 4.7E-05 | 4.6E-05 | 4.6E-05 | 4.5E-05 | 4.6E-05 | 4.5E-05 | 4.6E-05 | 4.6E-05 | 4.6E-05 | 4.7E-05 | 4.7E-05 | 4.7E-05 | 4.7E-05 | 4.6E-05 | 6.5E-05 | 4.3E-05 | 2.1E-05 | 2.8E-05 | 1.3E-04 |
| ***Compressor Exhaust*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Engines (Transmission) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Turbines (Transmission) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
|

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Services - Unprotected steel | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Services - Protected steel | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Services - Plastic | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Services - Copper | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Meter/Regulator (City Gates)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M&R >300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| M&R 100-300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| M&R <100 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Reg >300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| R-Vault >300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Reg 100-300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| R-Vault 100-300 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Reg 40-100 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| R-Vault 40-100 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Reg <40 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Customer Meters*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Commercial | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Industrial | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Routine Maintenance*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valve Releases | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Pipeline Blowdown | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mishaps (Dig-ins) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| **OTHER** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Net Emissions** | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| ***Post-Meter*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Commercial | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Industrial & Power Plants | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |
| Natural Gas Vehicles | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE |

## Table 3.6-15: Average N2O Emission Factors (kg/unit activity) for Natural Gas Systems Sources, for All Years

Average emission factors for each emission source in this table equal national emissions (from Table 3.6-14) divided by national activity data (from Table 3.6-7).

**Table Footnotes:**

"NA" indicates value not applicable

| Segment/Source | Units | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EXPLORATION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-completion well testing - vented | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non-completion well testing - flared | kg/event | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 62.4 | 0.0 | 4 9 | 1.3 | 0.0 | NA |
| HF Completions - Non-REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| HF Completions - Non-REC with Flaring | kg/event | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 0.5 | 0.860 | 0.88 | 1.1 | 0.2 | 0 5 | 0.7 | 0.6 | 0.4 |
| HF Completions - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| HF Completions - REC with Flaring | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 0.7 | 0.755 | 0.235 | 4.4 | 0.4 | 0 9 | 0.3 | 0.3 | 0.3 |
| Non-HF Completions - vented | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non-HF Completions - flared | kg/event | 0.8 | 0.8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.8 | 0 8 | 0.8 | 0.8 | 0.0 | 0.6 | 0.7 | 4.9 | 0.03 | 0.04 | 0.3 | 0.0 | NA |
| Well Drilling | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **PRODUCTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Gas Wells*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-associated Gas Wells (less fractured wells) | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Gas Wells with Hydraulic Fracturing | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Well Pad Equipment*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heaters | kg/heater | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Separators | kg/separator | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dehydrators | kg/dehydrator | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Meters/Piping | kg/meter | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Compressors | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Well Workovers*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HF Workovers - Non-REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| HF Workovers - Non-REC with Flaring | kg/event | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 2.0 | 2 0 | 2.0 | 2.0 | 0.5 | 0.860 | 0.88 | 1.1 | 0.2 | 0.5 | 0.7 | 0.6 | 0.4 |
| HF Workovers - REC with Venting | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| HF Workovers - REC with Flaring | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 1.107 | 0.7 | 0.755 | 0.235 | 4.4 | 0.4 | 0 9 | 0.3 | 0.3 | 0.3 |
| Non-HF Workovers - vented | kg/event | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Non-HF Workovers - flared | kg/event | NA | NA | NA | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 19.4 | 0.001 | 0.1 | 0.0034 | 0.0003 | 0 0003 | 0.0019 | 0.0001 |
| ***Produced Water*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Natural Gas Wells | kg/MMbbl produced water | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Device Vents | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Low Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (High Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Intermittent Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chemical Injection Pumps | kg/pump | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Kimray Pumps | kg/MMscf | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dehydrator Vents | kg/MMscf | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | kg/MMscf | 0.0 | 0.0 | 0.0 | 1.9E-05 | 3 8E-05 | 5.7E-05 | 7.6E-05 | 9.5E-05 | 1.1E-04 | 1.3E-04 | 1.5E-04 | 1.7E-04 | 1 9E-04 | 2.1E-04 | 2.3E-04 | 2.5E-04 | 2.6E-04 | 2.8E-04 | 3.0E-04 | 3.2E-04 | 3.4E-04 | 3.6E-04 | 3.8E-04 | 4.0E-04 | 4 2E-04 | 4.3E-04 | 1.5E-04 | 1.1E-04 | 1.1E-04 | 1.8E-04 | 1.6E-04 |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 1 0E-05 | 4.6E-06 | 1.0E-05 |
| Misc. Onshore Production Flaring (430 - Permian Basin) | kg/MMscf | 0.0 | 0.0 | 0.0 | 1.9E-05 | 3 8E-05 | 5.8E-05 | 7.7E-05 | 9.6E-05 | 1 2E-04 | 1.3E-04 | 1.5E-04 | 1.7E-04 | 1 9E-04 | 2.1E-04 | 2.3E-04 | 2.5E-04 | 2.7E-04 | 2.9E-04 | 3.1E-04 | 3.3E-04 | 3.5E-04 | 3.6E-04 | 3.8E-04 | 4.0E-04 | 4 2E-04 | 4.4E-04 | 3.5E-04 | 3.7E-04 | 2 8E-04 | 3.7E-04 | 1.9E-04 |
| Misc. Onshore Production Flaring (Other Basins) | kg/MMscf | 0.0 | 0.0 | 0.0 | 7.9E-07 | 1.6E-06 | 2.4E-06 | 3.2E-06 | 3.9E-06 | 4.7E-06 | 5.5E-06 | 6.3E-06 | 7.1E-06 | 7 9E-06 | 8.7E-06 | 9.5E-06 | 1.0E-05 | 1.1E-05 | 1.2E-05 | 1.3E-05 | 1.3E-05 | 1.4E-05 | 1.5E-05 | 1.6E-05 | 1.7E-05 | 1.7E-05 | 1.8E-05 | 3.1E-05 | 1.6E-05 | 2.6E-05 | 2.1E-05 | 1.5E-05 |
| ***Condensate Tank Vents*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Large Tanks w/Flares | kg/bbl | 1 2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1 2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1 2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1 2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.1E-05 | 1.1E-05 | 7 3E-06 | 4.3E-06 | 3.9E-06 |
| Large Tanks w/VRU | kg/bbl | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Large Tanks w/o Control | kg/bbl | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Small Tanks w/Flares | kg/bbl | NA | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 1.1E-05 | 5.9E-06 | 2 0E-05 | 1.1E-05 | 6.3E-06 | 1.1E-06 |
| Small Tanks w/o Flares | kg/bbl | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Malfunctioning Separator Dump Valves | kg/bbl | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Compressor Exhaust Vented*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Well Clean Ups*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liquids Unloading with Plunger Lifts | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Liquids Unloading without Plunger Lifts | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Blowdowns*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vessel BD | kg/vessel | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Compressor BD | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Compressor Starts | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valves | kg/PRV | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Offshore*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GOM Federal Waters, Vent/Leak | kg/complex | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| GOM State Waters, Vent/Leak | kg/complex | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Alaska State Waters, Vent/Leak | kg/MMcf | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| GOM Federal Waters, Flare | kg/MMBtu | 0.001 | 0.001 | 0 001 | 0 001 | 0.001 | 0.001 | 0 001 | 0 001 | 0.001 | 0.001 | 0 001 | 0.001 | 0.001 | 0.001 | 0 001 | 0.001 | 0.001 | 0.001 | 0 001 | 0.001 | 0.001 | 0.001 | 0 001 | 0.001 | 0.001 | 0.001 | 0 001 | 0.001 | 0.001 | 0 001 | |
| GOM State Waters, Flare | kg/MMcf | 0 0003 | 0.0003 | 0.0002 | 0.0002 | 0 0002 | 0.0003 | 0.0003 | 0.0004 | 0 0005 | 0.0004 | 0.0003 | 0.0003 | 0 0004 | 0.0003 | 0.0003 | 0.0004 | 0 0004 | 0.0004 | 0 001 | 0.001 | 0.002 | 0.002 | 0 002 | 0.002 | 0.003 | 0.002 | 0 002 | 0.002 | 0.003 | 0.000 | 0 000 |
| Alaska State Waters, Flare | kg/MMcf | 0.004 | 0.004 | 0 004 | 0 004 | 0.004 | 0.004 | 0 004 | 0 004 | 0.004 | 0.004 | 0 004 | 0.004 | 0.004 | 0.004 | 0 004 | 0.004 | 0.004 | 0.004 | 0 004 | 0.004 | 0.004 | 0.004 | 0 004 | 0.004 | 0.004 | 0.004 | 0 003 | 0.003 | 0.002 | 0.000 | 0 000 |
| ***Gathering and Boosting*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G&B Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tanks | kg/tank | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0.02 | 0.02 | 0 02 | 0.02 | 0 0 | 0.0 | 0.0 |
| Dehy Vents - Large units | kg/dehydrator | 6.9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6 9 | 6.9 | 6.9 | 6.9 | 6.9 | 1 0 | 1.0 | 0.9 | 4.8 |
| Dehy Vents - Small units | kg/dehydrator | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0 3 | 0.2 | 0.2 | 0.0 |
| Flare Stacks | kg/flare | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 0 9 | 1.4 | 1.7 | 0.8 |
| G&B Pipeline Leaks | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| G&B Pipeline Blowdowns | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **GAS PROCESSING PLANTS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Plant Grouped Emission Sources[a] | kg/plant | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plant Fugitives | kg/plant | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Recip. Compressors | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Centrifugal Compressors (wet seals) | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Centrifugal Compressors (dry seals) | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dehydrators | kg/plant | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Flares | kg/plant | 0.0 | 0.0 | 0.0 | 1 5 | 3.1 | 4.6 | 6.1 | 7.6 | 9.2 | 10.7 | 12.2 | 13.7 | 15.3 | 16.8 | 18.3 | 19 8 | 21.4 | 22.9 | 24.4 | 26 0 | 27.5 | 29.0 | 29.0 | 29 0 | 29.0 | 29.0 | 18.8 | 15 0 | 17.0 | 28.6 | 24.0 |
| ***Normal Operations*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Compressor Exhaust | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gas Engines | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Gas Turbines | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| AGR Vents | kg/AGR | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pneumatic Devices | kg/plant | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Blowdowns/Venting | kg/plant | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **TRANSMISSION AND STORAGE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pipeline Leaks | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Compressor Stations (Transmission)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Total Emissions | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Station + Compressor Fugitive Emissions | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reciprocating Compressor | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Centrifugal Compressor (wet seals) | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Centrifugal Compressor (dry seals) | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Compressor Stations (Storage)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Total Emissions | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Station + Compressor Fugitive Emissions | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reciprocating Compressor | kg/compressor | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Wells (Storage) | kg/well | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| M&R (Trans. Co. Interconnect) | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| M&R (Farm Taps + Direct Sales) | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Normal Operation*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dehydrator vents (Transmission) | kg/MMscf | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dehydrator vents (Storage) | kg/MMscf | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Flaring (Transmission) | kg/station | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.02 | 0.04 | 0 05 | 0 08 | 0.10 |
| Flaring (Storage) | kg/station | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.4 |
| ***Compressor Exhaust*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Engines (Transmission) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Turbines (Transmission) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Engines (Storage) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Turbines (Storage) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Generators (Engines) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Generators (Turbines) | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Pneumatic Devices Trans + Stor*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumatic Devices Transmission | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (High Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Intermittent Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Low Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pneumatic Devices Storage | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (High Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Intermittent Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| (Low Bleed) | kg/controller | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Routine Maintenance/Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pipeline venting | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Station venting Trans + Storage*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Station Venting Transmission | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Station Venting Storage | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **LNG Storage** | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LNG Export Terminals (flares) | kg/terminal | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0 0 | 0.0 | 0.0 | 116.5 | 245 5 | 155.5 | 266.5 | 460.1 |
| LNG Export Terminal Blowdowns | kg/terminal | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| LNG Export Terminal Engine Exhaust | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| LNG Export Terminal Turbine Exhaust | kg/MMHPhr | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **DISTRIBUTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Pipeline Leaks*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mains - Cast Iron | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mains - Unprotected steel | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mains - Protected steel | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mains - Plastic | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Services - Unprotected steel | kg/service | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Services Protected steel | kg/service | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Services - Plastic | kg/service | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Services - Copper | kg/service | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Meter/Regulator (City Gates)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M&R >300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| M&R 100-300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| M&R <100 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reg >300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| R-Vault >300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reg 100-300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| R-Vault 100-300 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reg 40-100 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| R-Vault 40-100 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Reg <40 | kg/station | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Customer Meters*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | kg/meter | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Commercial | kg/meter | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Industrial | kg/meter | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Routine Maintenance*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pressure Relief Valve Releases | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pipeline Blowdown | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| ***Upsets*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mishaps (Dig-ins) | kg/mile | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **OTHER** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ***Post-Meter*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Residential | kg/NG house | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Commercial | kg/appliances | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Industrial & Power Plants | kg/BCF | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Natural Gas Vehicles | kg/vehicle | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Table 3.6-16: N2O Emission Factors for Natural Gas Systems, Data Sources/Methodology | | |
|---|---|---|
| **Segment/Source** | **Units** | **Data Source(s)/Methodology** |
| **EXPLORATION** | | |
| Non-completion well testing - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Non-completion well testing - flared | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Completions - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Completions - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Completions - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Completions - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Non-HF Completions - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Non-HF Completions - flared | kg/event | |
| Well Drilling | kg/well | NA |
| **PRODUCTION** | | |
| **Gas Wells** | | |
| Total Producing Gas Wells | kg/well | NA |
| Non-associated Gas Wells (less fractured wells) | kg/well | NA |
| Gas Wells with Hydraulic Fracturing | kg/well | NA |
| **Well Pad Equipment** | | |
| Heaters | kg/heater | NA |
| Separators | kg/separator | NA |
| Dehydrators | kg/dehydrator | NA |
| Meters/Piping | kg/meter | NA |
| Compressors | kg/compressor | NA |
| **Well Workovers** | | |
| HF Workovers - Non-REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Workovers - Non-REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Workovers - REC with Venting | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| HF Workovers - REC with Flaring | kg/event | 2011-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2011 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Non-HF Workovers - vented | kg/event | 2015-2020: Calculated using year-specific GHGRP subpart W data for each control category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Non-HF Workovers - flared | kg/event | |
| **Normal Operations** | | |
| Pneumatic Device Vents | kg/controller | NA |
| Pneumatic Device Vents - Low Bleed (LB) | kg/controller | NA |
| Pneumatic Device Vents - High Bleed (HB) | kg/controller | NA |
| Pneumatic Device Vents - Intermittent Bleed (IB) | kg/controller | NA |
| Chemical Injection Pumps | kg/pump | NA |
| Kimray Pumps | kg/MMscf | NA |
| Dehydrator Vents | kg/MMscf | NA |
| Misc. Onshore Production Flaring (220 - Gulf Coast Basin [LA TX]) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b and 2019c for additional detail. |
| Misc. Onshore Production Flaring (395 - Williston Basin) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b and 2019c for additional detail. |
| Misc. Onshore Production Flaring (430 - Permian Basin) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b and 2019c for additional detail. |
| Misc. Onshore Production Flaring (Other Basins) | kg/mscf | 1990-1992: Assumed to be zero (GRI/EPA 1996). 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1993-2014: Linear interpolation. Refer to EPA 2018b and 2019c for additional detail. |
| **Condensate Tank Vents** | | |
| Large Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Large Tanks w/VRU | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Large Tanks w/o Control | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Small Tanks w/Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Small Tanks w/o Flares | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Malfunctioning Separator Dump Valves | kg/bbl | 2015-2020: Calculated using year-specific GHGRP subpart W data for each tank category (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2017b and EPA 2019c for additional detail. |
| **Compressor Exhaust Vented** | | |
| Gas Engines | kg/MMHPhr | NA |
| **Well Clean Ups** | | |
| Liquids Unloading with Plunger Lifts | kg/venting well | NA |
| Liquids Unloading without Plunger Lifts | kg/venting well | NA |
| **Blowdowns** | | |
| Vessel Blowdowns | kg/vessel | NA |
| Compressor Blowdowns | kg/compressor | NA |
| Compressor Starts | kg/compressor | NA |
| **Upsets** | | |
| Pressure Relief Valves | kg/PRV | NA |
| Mishaps | kg/mile | NA |
| **Produced Water** | | |
| Natural Gas Wells | kg/MMbbl produced water | NA |
| **Offshore** | | |
| GOM Federal Waters, Vent/Leak | kg/complex | NA |
| GOM State Waters, Vent/Leak | kg/MMcf | NA |
| Alaska State Waters, Vent/Leak | kg/MMcf | NA |
| GOM Federal Waters, Flare | kg/MMBtu (of flared gas) | Calculated from flaring volumes reported in OGOR-B reports (BOEM 2021d). Refer to EPA 2020a for detail. |
| GOM State Waters, Flare | kg/MMcf | Equals GOM federal waters emissions divided by GOM federal waters gas production from gas wells (BOEM 2021b, BOEM 2021c), calculated for each year. Refer to EPA 2020a for detail. |

| | | |
|---|---|---|
| Alaska State Waters, Flare | kg/MMcf | 2015 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2020a for detail. |
| **Gathering and Boosting** | | |
| G&B Stations | | |
| Tanks | kg/tank | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Dehy Vents - Large units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Dehy Vents - Small units | kg/dehydrator | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| Flare Stacks | kg/flare | 2016 forward: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2015: Year 2016 emission factors applied. Refer to EPA 2020b for detail. |
| G&B Pipeline Leaks | kg/mile | NA |
| G&B Pipeline Blowdowns | kg/mile | NA |
| **GAS PROCESSING PLANTS** | | |
| Plant Grouped Emission Sources | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Plant Fugitives | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Reciprocating Compressors | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Centrifugal Compressors (wet seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Centrifugal Compressors (dry seals) | kg/compressor | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Flares | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Dehydrators | kg/plant | 2015-2020: Calculated using year-specific GHGRP subpart W data for each emission source (EPA 2021c). 2011-2014: Year 2015 emission factors. 1990-1992: [CH4 EF] / [CH4 content in whole gas (GRI/EPA 1996)] * [CO2 content in whole gas (GTI 2001)]. 1993-2010: Linear interpolation. Refer to EPA 2017b and EPA 2019c for additional detail. |
| Compressor Exhaust | | |
| Gas Engines | kg/MMHPhr | NA |
| Gas Turbines | kg/MMHPhr | |
| AGR Vents | kg/plant | NA |
| Pneumatic Devices | kg/plant | NA |
| Blowdowns/Venting | kg/plant | NA |
| **TRANSMISSION AND STORAGE** | | |
| Pipeline Leaks | kg/mile | NA |
| ***Compressor Stations (Transmission)*** | | |
| Station + Compressor Fugitive Emissions | kg/station | NA |
| Reciprocating Compressor | kg/compressor | NA |
| Centrifugal Compressor (total) | kg/compressor | NA |
| Centrifugal Compressor (wet seals) | kg/compressor | NA |
| Centrifugal Compressor (dry seals) | kg/compressor | NA |
| ***Compressor Stations (Storage)*** | | |
| Station | kg/station | NA |
| Reciprocating Compressor | kg/compressor | NA |
| Wells (Storage) | kg/well | NA |
| M&R (Trans. Co. Interconnect) | kg/station | NA |
| M&R (Farm Taps + Direct Sales) | kg/station | NA |
| ***Normal Operation*** | | |
| Dehydrator vents (Transmission) | kg/MMscf | NA |
| Dehydrator vents (Storage) | kg/MMscf | NA |
| Flaring (Transmission) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| Flaring (Storage) | kg/station | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors. Refer to EPA 2018b and 2019c for additional detail. |
| ***Compressor Exhaust*** | | |
| Engines (Transmission) | kg/MMHPhr | NA |
| Turbines (Transmission) | kg/MMHPhr | NA |
| Engines (Storage) | kg/MMHPhr | NA |
| Turbines (Storage) | kg/MMHPhr | NA |
| Generators (Engines) | kg/MMHPhr | NA |
| Generators (Turbines) | kg/MMHPhr | NA |
| ***Pneumatic Devices Trans + Stor*** | | |
| Pneumatic Devices Transmission | kg/device | NA |
| (High Bleed) | kg/device | NA |
| (Intermittent Bleed) | kg/device | NA |
| (Low Bleed) | kg/device | NA |
| Pneumatic Devices Storage | kg/device | NA |
| (High Bleed) | kg/device | NA |
| (Intermittent Bleed) | kg/device | NA |
| (Low Bleed) | kg/device | NA |
| ***Routine Maintenance/Upsets*** | | |
| Pipeline venting | kg/mile | NA |
| ***Station venting Trans + Storage*** | | |
| Station Venting Transmission | kg/station | NA |
| Station Venting Storage | kg/station | NA |
| **LNG Storage** | | |
| LNG Stations (flares) | kg/facility | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Station Blowdowns | kg/facility | NA |
| LNG Station Engine Exhaust | kg/MMHPhr | NA |
| LNG Station Turbine Exhaust | kg/MMHPhr | NA |
| **LNG Import/Export Terminals** | | |
| LNG Import Terminals (flares) | kg/terminal | Calculated rolling 3-yr average of GHGRP subpart W RY2015-2020 data (EPA 2021c). Refer to EPA 2019b for additional detail. |
| LNG Import Terminal Blowdowns | kg/terminal | NA |
| LNG Import Terminal Engine Exhaust | kg/MMHPhr | NA |
| LNG Import Terminal Turbine Exhaust | kg/MMHPhr | NA |

| | | |
|---|---|---|
| LNG Export Terminals (flares) | kg/terminal | 2015-2020: Calculated using year-specific GHGRP subpart W data (EPA 2021c). 1990-2014: Year 2015 emission factors applied. Refer to EPA 2019b for additional detail. |
| LNG Export Terminal Blowdowns | kg/terminal | NA |
| LNG Export Terminal Engine Exhaust | kg/MMHPhr | NA |
| LNG Export Terminal Turbine Exhaust | kg/MMHPhr | NA |
| **DISTRIBUTION** | | |
| ***Pipeline Leaks*** | | |
| Mains - Cast Iron | kg/mile | NA |
| Mains - Unprotected steel | kg/mile | NA |
| Mains - Protected steel | kg/mile | NA |
| Mains - Plastic | kg/mile | NA |
| Total Pipeline Miles | kg/mile | NA |
| Services - Unprotected steel | kg/service | NA |
| Services Protected steel | kg/service | NA |
| Services - Plastic | kg/service | NA |
| Services - Copper | kg/service | NA |
| Total Services | kg/service | NA |
| ***Meter/Regulator (City Gates)*** | | |
| M&R >300 | kg/station | NA |
| M&R 100-300 | kg/station | NA |
| M&R <100 | kg/station | NA |
| Reg >300 | kg/station | NA |
| R-Vault >300 | kg/station | NA |
| Reg 100-300 | kg/station | NA |
| R-Vault 100-300 | kg/station | NA |
| Reg 40-100 | kg/station | NA |
| R-Vault 40-100 | kg/station | NA |
| Reg <40 | kg/station | NA |
| ***Customer Meters*** | | |
| Residential | kg/outdoor meter | NA |
| Commercial/Industry | kg/meter | NA |
| ***Rountine Maintenance*** | | |
| Pressure Relief Valve Releases | kg/mile main | NA |
| Pipeline Blowdown | kg/mile | NA |
| ***Upsets*** | | |
| Mishaps (Dig-ins) | kg/mile | NA |
| **POST-METER** | | |
| Residential | kg/NG house | NA |
| Commercial | kg/appliance | NA |
| Industrial & EGUs | kg/BCF | NA |
| Natural Gas Vehicles | kg/vehicle | NA |

**Table 3.6-17: Annex 3.6 Electronic Tables - References**

| Citation | Reference |
|---|---|
| AL/DOGB (2021) | Alabama Oil and Gas Board. Production Data. Available online at <https://www.gsa.state.al.us/ogb/production> |
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**From:** Skone, Timothy
**Sent:** Tue, 9 May 2023 16:04:59 +0000
**To:** Jamieson, Matthew B.
**Subject:** FW: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI
**Attachments:** image002.png, image008.png, image009.jpg, image010.jpg, image011.jpg, image012.jpg, acssuschemeng.1c03307.pdf

Matt,

Before I left for vacation I had asked Fiji what Cheniere was using for comparison of NG LCA results. He recommended that we use a similar set as KeyLogic used in the Cheniere work, with a specific mention to Rutherford et. al. The comparison can be found in the Cheniere's paper (attached) and in SI, Figure S13. We would have to remove the LNG operations.

I have not looked in to – do you have a copy of the Rutherford paper?

We should discuss today IF we should try and compare our 2020 results to the same data sources as in the Cheniere paper in addition to the GHGI to ensure a comparison to other works to help defend our result.

Thanks,

Tim

---

**From:** Fiji George <Fiji.George@cheniere.com>
**Sent:** Thursday, April 20, 2023 6:04 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** Fwd: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

Tim
FYI

Fiji George

Begin forwarded message:

**From:** Fiji George <Fiji.George@cheniere.com>
**Date:** April 20, 2023 at 3:56:00 PM CDT
**To:** "McNutt, Paul (Hiregenics)" <Paul.McNutt@contractor.conocophillips.com>, "KNIGHT, AUSTIN" <austinknight@chevron.com>, "Freitas, Christopher" <christopher.freitas@hq.doe.gov>, "Dabbar, John M" <John.M.Dabbar@conocophillips.com>, "Rice, Darin" <DYRice@chevron.com>, "Vargas, Melania" <Melany.Vargas@woodmac.com>
**Cc:** Marshall Nichols <mnichols@npc.org>, jslutz@npc.org
**Subject: RE: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI**

So as reference against the GREET update, we at Cheniere also published sensitivity using Rutherford (Stanford) and Lyon et al (EDF) recent studies in our peer-reviewed publications. The figure copied below is from the Supplemental information and I have included extracts from the paper. Note our model is highly customized to our supply chain with operator level bespoke datasets (at a facility level). GREET comes up with a 39% but that assumes the Rutherford and Alvarez studies represent national data sets, and so does the Cheniere model run (32-37% for the boundary that includes liquefaction and shipping instead of distribution) when assuming skewed distributions from the Rutherford study to represent our supply chain. Since this is not representative of our supply chain, we present it as a sensitivity analysis in our work. There are only few publicly available modeling results on a regional level. And NETL reports do provide the regional datasets too. Finally, emissions intensity is an output of key parameters that go into the model as noted in Table 1 of the GREET file link I sent earlier. So if you are using GREET, you will need to settle on the key inputs for your regional data sets to arrive at the intensities.

---

From the paper (Attached)

The GHGRP assumes flaring emissions from a destruction efficiency of 98% and relies on national average values per source for fugitive emission factors, both of which have been shown to vary widely by Lyon et al. and Rutherford et al**. When the Permian flare efficiency is modeled as 93% for known suppliers, the net effect on the GHG intensity in this study is less than a 1% increase on a 100 year GWP basis** (wellhead through regasification basis) since the SPL supply chain had relatively few Permian basin suppliers in 2018. **Modeling deterministically the average fugitive emission factors proposed by Rutherford et al. results in a less than 1% increase in the GHG intensity on a 100 year GWP basis (wellhead through regasification basis).** However, as described in SI 7, uncertainty surrounding emission factors used for production and G&B fugitives may lead to larger impacts. **Finally, the sensitivity on atmospheric storage tank thief hatches and other gas release points on tanks resulted in a 5–6% increase in production through regasification GHG intensity on a 100 year GWP basis**. Sensitivity analyses and results are further documented in SI 7.

From SI 7:

As shown in Figure S13, when Rutherford et al. average emission factors are used (deterministic factor), the LCA result is comparable to the baseline result. **However, when the emission factor uncertainty distribution is simulated, the expected LCA result increases by 32-37% on a production through regasification basis (China and UK).** As discussed above, due to the skewed shape of the triangular distribution, the highly right-skewed maximum values effect the simulated averages (as compared to the reported parameter average value in Rutherford et al.), increasing the overall LCA result.

**From:** Fiji George
**Sent:** Thursday, April 20, 2023 2:08 PM
**To:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>; KNIGHT, AUSTIN <austinknight@chevron.com>; Freitas, Christopher <christopher.freitas@hq.doe.gov>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Rice, Darin <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org
**Subject:** RE: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

Metadata on GREET's calculate of fugitive methane emission from NG's systems can be accessed at link (the GREET team publishes high-level updates with each GREET release), specific details on Argonne's methodology (e.g. the Alvarez vs EPA GHGI approach) is documented at link. Table 3 has the hybrid inputs that includes the Alvarez et al (EDF) study and the Jeff Rutherford (Stanford Study). When hybrid data sets are run via GREET (production through distribution), the intensity increases by 39%.

**From:** Fiji George
**Sent:** Thursday, April 20, 2023 1:56 PM
**To:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>; KNIGHT, AUSTIN <austinknight@chevron.com>; Freitas, Christopher <christopher.freitas@hq.doe.gov>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Rice, Darin <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org
**Subject:** RE: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

I have not used GREET but do know that with GREET, the user can select specific data sources- GHGI or perhaps Alvarez et al. I recommend connecting with Michael Wang or Troy Hawkins (who I tried to recruit to my TG) at ANL and the GREET team (Hao Cai).

**From:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>
**Sent:** Thursday, April 20, 2023 11:59 AM
**To:** KNIGHT, AUSTIN <austinknight@chevron.com>; Freitas, Christopher <christopher.freitas@hq.doe.gov>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Rice, Darin <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>; Fiji George <Fiji.George@cheniere.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org
**Subject:** RE: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

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Probably best if Fiji can respond directly to that question.

**From:** KNIGHT, AUSTIN <austinknight@chevron.com>
**Sent:** Thursday, April 20, 2023 11:47 AM
**To:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>; Freitas, Christopher <christopher.freitas@hq.doe.gov>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Rice, Darin <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>; Fiji George (Fiji.George@cheniere.com) <fiji.george@cheniere.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org
**Subject:** RE: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

Thank you, Chris.

Regarding the GREET 2022 update, I understand there are 2 approaches described: EPA GHGI and Hybrid (Alvarez). When you say GREET default values, to which of these are you referring?

Paul, I don't know how the NETL figures compare… does the GHG study have a viewpoint?

Best,
Austin

**Austin Knight**
**Vice President, Hydrogen**
austinknight@chevron.com

**Chevron New Energies**
**a division of Chevron U.S.A. Inc.**
1400 Smith Street
Houston, Texas 77002
(b) (6)

---

**From:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>
**Sent:** Thursday, April 20, 2023 10:16 AM
**To:** Freitas, Christopher <christopher.freitas@hq.doe.gov>; KNIGHT, AUSTIN <austinknight@chevron.com>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Rice, Darin <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>; Fiji George (Fiji.George@cheniere.com) <fiji.george@cheniere.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org
**Subject:** [**EXTERNAL**] Re: [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

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Okay thanks for the clarification, Christopher. That does reflect the discussion more robustly.

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**From:** Freitas, Christopher <christopher.freitas@hq.doe.gov>
**Sent:** Thursday, April 20, 2023 10:03:48 AM
**To:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>; Austin Knight (austinknight@chevron.com) <austinknight@chevron.com>; Dabbar, John M <John.M.Dabbar@conocophillips.com>; Darin Rice <DYRice@chevron.com>; Vargas, Melania <Melany.Vargas@woodmac.com>; Fiji George (Fiji.George@cheniere.com) <fiji.george@cheniere.com>
**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org <jslutz@npc.org>
**Subject:** [EXTERNAL]RE: Proposed Pathforward for H2/GHG Methane CI

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Paul,
Yes, I support the path forward. However, I want to clarify that DOE supports using a published, peer reviewed, National Lab LCA -preferably the NETL life cycle natural gas model because it has modeled upstream emissions factors by basin and sub basin. However, DOE would also support using the GREET default values.

Christopher

Christopher J. Freitas
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**From:** McNutt, Paul (Hiregenics) <Paul.McNutt@contractor.conocophillips.com>
**Sent:** Wednesday, April 19, 2023 6:14 PM
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**Cc:** Marshall Nichols <mnichols@npc.org>; jslutz@npc.org; Freitas, Christopher <christopher.freitas@hq.doe.gov>
**Subject:** [EXTERNAL] Proposed Pathforward for H2/GHG Methane CI

A meeting was held April 19, 2023to discuss this topic. A summary of the positions follows:

1. H2 Study planned to use GREET defaults.
2. EDF proposed regional numbers based on their unpublished research.
3. H2 Study offered a compromise set of values in three tiers.
4. NG GHG Study is not ready to commit to any number other than published, peer-reviewed, preferably National Lab values.
5. DOE supported using the GREET default values.

Some recommendations to move this forward recognizing the workload and timing include:

1. H2 Study reverts to the GREET default values to keep the study on track and ensure alignment between the studies.
2. Include a recommendation in the H2 Study for further work based on the results of the NG GHG Study. The H2 Study might prepare a specific work plan or output that they request NG GHG Study to complete e.g. a template or format by which the NG GHG Study results can be used in further work on H2 pursuant to the completed H2 Study.
3. Include a discussion in the NG GHG Study of the GREET default values and where they fall in the range.
4. Convene a meeting with EDF and key representatives from both studies to agree a path forward and define the further work.

These four recommendations are a starting point for what I hope will be an inclusive discussion. I am happy to discuss further as needed.

Austin, JD, and Christopher, please indicate if you support this path forward.

Paul

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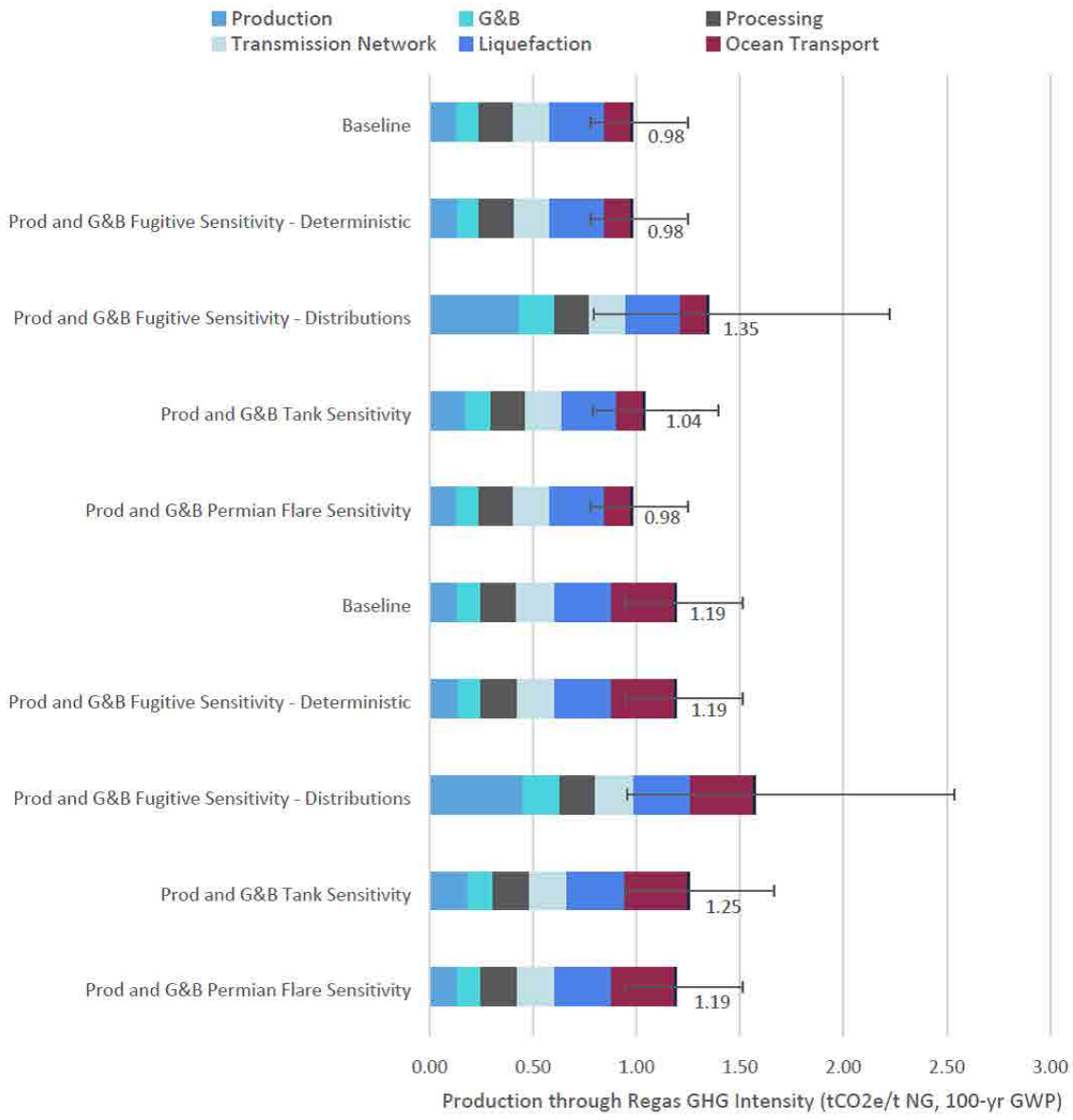



**Figure S13**. Sensitivity analysis results, production through regasification, 100-yr GWP





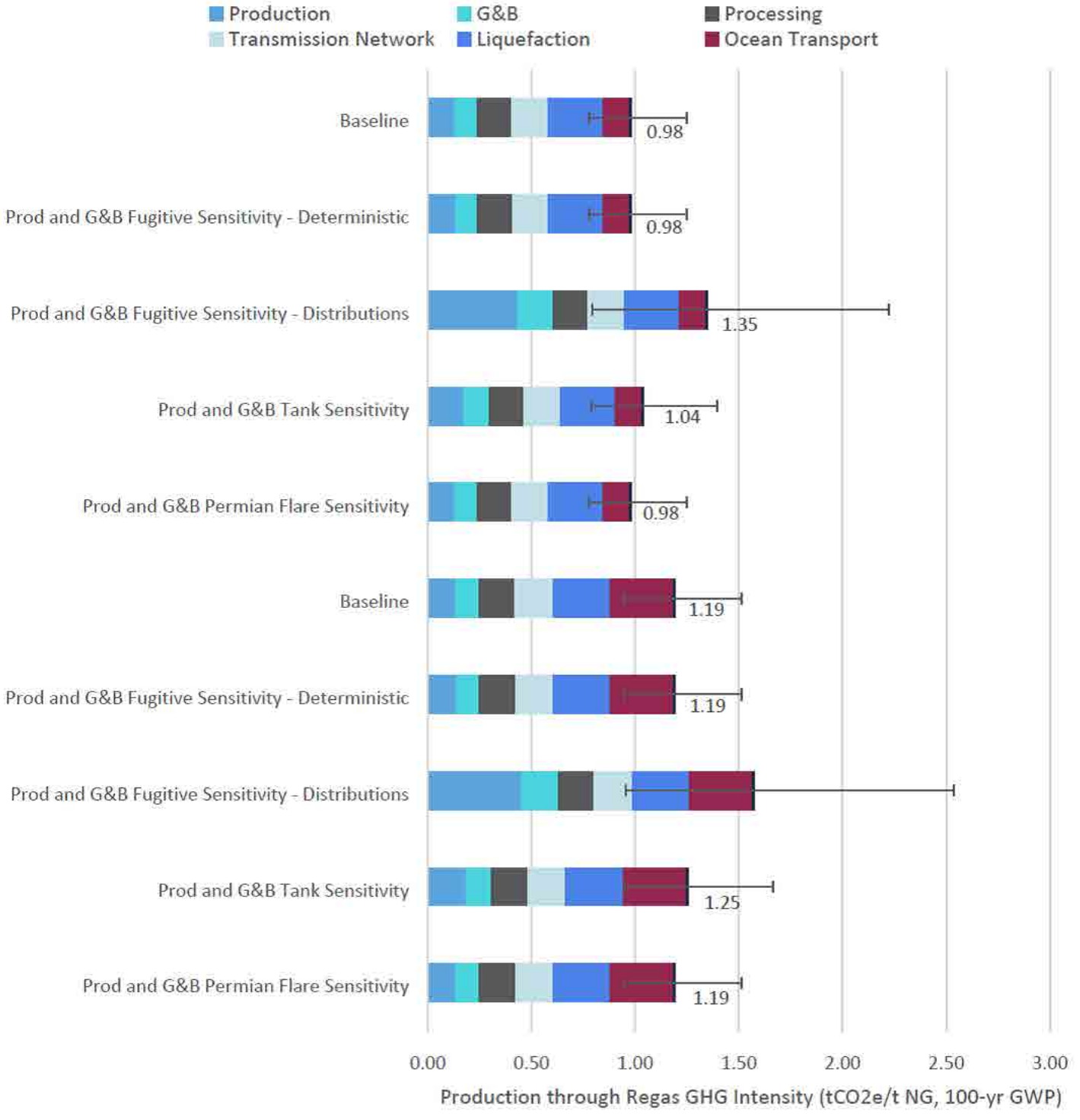



**Figure S13**. Sensitivity analysis results, production through regasification, 100-yr GWP



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Research Article

# LNG Supply Chains: A Supplier-Specific Life-Cycle Assessment for Improved Emission Accounting

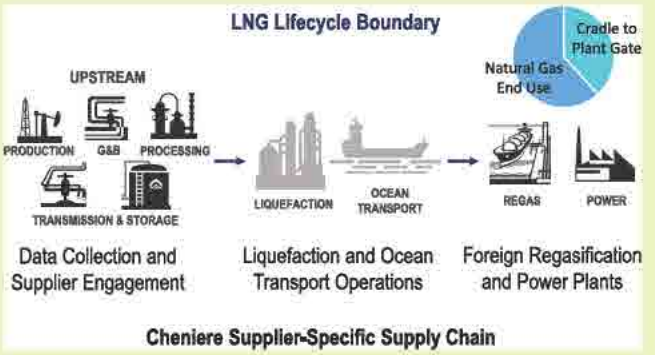
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**ABSTRACT:** Global trade in liquefied natural gas (LNG) is growing significantly, as is interest in the life-cycle greenhouse gas (GHG) emissions associated with LNG. Most assessments of life-cycle GHG emissions from LNG have employed national or regional average emission estimates; however, there is significant variability in emissions across different suppliers and across the natural gas supply chain. This work describes a framework for compiling supplier-specific GHG emission data for LNG, from the producing well to regasification at the destination port. A case study is presented for Cheniere Energy's Sabine Pass Liquefaction (SPL) LNG supply chain from production in the United States and delivered to China. GHG emission intensities are estimated to be 30−43% lower than other analyses employing national or regional average emission profiles. The segments driving these differences are gas production and gathering, transmission, and ocean transport. Extending the boundaries of this analysis to the power plant illustrates the effect of fuel switching from coal to natural gas; the effect of fuel switching in China is a 47−57% reduction in GHG emission intensity, cradle through power generation. This work highlights the important role customized life-cycle assessments can play to improve GHG emission estimates and differentiate supply chains to inform business and policy decisions related to the transition to a low carbon future.




**KEYWORDS:** *liquefied natural gas, LCA, global warming, GHG, methane, supply chain, carbon, carbon neutral*

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## INTRODUCTION

The global LNG industry has experienced a period of rapid growth, reaching a record ~355 million tonnes (MT) traded in 2019 (~13% increase from 2018).[1] In the United States (U.S.), large-scale LNG exports from the lower 48 states are a recent phenomenon with the start of operations at Cheniere's Sabine Pass Liquefaction (SPL) facility in 2016. U.S. LNG exports grew almost 13-fold from 2016 to 2020, from ~3.7 to ~46.8 MT, and have been delivered to 36 countries and regions.[2] Continued growth for LNG exports is forecast, with expectations for future global demand ranging from ~450[3] to ~700 MTPA by 2040.[4]

Concurrently, significant reductions in greenhouse gas (GHG) emissions are needed to align with the Paris Agreement goals to limit global warming to well below 2 °C.[5] Methane ($CH_4$) and carbon dioxide ($CO_2$) emissions from the LNG life cycle and natural gas end uses vary widely across different regions and supply chains, even as measurement data are still missing across many regions and industry segments.[6−9] Relative to traditional piped gas supply chains, LNG supply chains include liquefaction, shipping, and regasification stages which drive even greater variability in emissions profiles. For example, Gan et al.'s review of 37 global LNG supply scenarios to China concludes that GHG intensities varied by about 150%.[10]

Reducing GHG emissions across natural gas supply chains has become a key policy focus for many countries.[11−16] The European Union, whose gas imports account for about 36% of the total international natural gas trade,[17] is considering climate policy that includes embodied emissions associated with imported natural gas.[18] Accounting for such upstream emissions across national boundaries marks a departure from the standard production-based emission inventories.[19] However, a lack of standardized quantification, monitoring, reporting, and verification (QMRV) measures hampers the differentiation of emissions between different import routes and supply chains. This may result in the use of "default" emission factors[20] within corporate and government policies, which do not accurately reflect the variation in GHG emissions. Certain firms have responded to anticipated policy changes and buyer interest by

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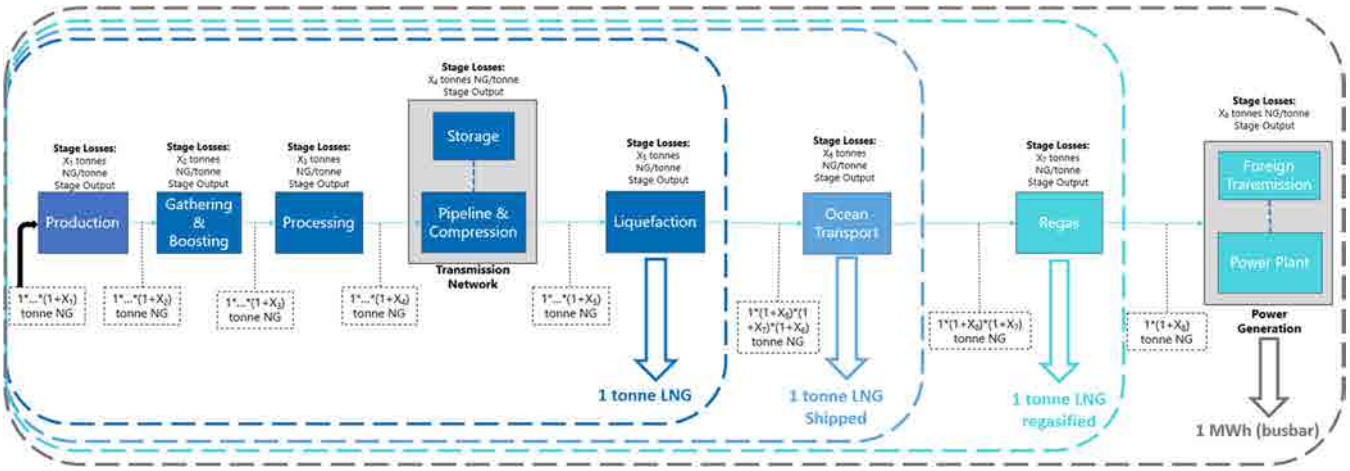



**Figure 1.** Life-cycle scaling and system boundaries used in this work. For each boundary, the supply chain losses (fugitives, venting, fuel consumption, etc.) are tracked and used to scale the process upstream of the functional unit (end point of the supply chain).

committing to provide life-cycle emission information, raising the possibility of more granular and reliable accounting.[21,22]

Reliable tools and data for estimating GHG emissions for supplier-specific LNG supply chains are needed to boost confidence in climate-driven policy decisions. To date, estimates of LNG supply chain emissions have not been supplier specific but national or regional in scope, often relying on generic emission factors and activity data to fill extensive data gaps.[23−25] We are unaware of any public study that incorporates detailed supplier-specific activity data to estimate bottom-up facility-level emissions across the LNG supply chain, including for natural gas liquefaction and ocean transport (see Supporting Information (SI) 15).[10,24,26−30] Current studies rely on national or regional emission data, but even at this level of aggregation highlight the importance of emission upstream of end use (power plant). The studies estimate that upstream GHG emissions account for 20−45% of wellhead through power plant $CO_2$e emissions on a 100 year basis, depending on exact scenario.[24,26,30,31]

Cheniere is the largest LNG exporter from the U.S. in terms of volumes exported as of the end of 2020.[2] This study develops an LCA framework to estimate GHG emissions representative of Cheniere's SPL LNG supply chain. This study conducts a uniquely detailed analysis mapping the LNG supply chain both upstream and downstream from Cheniere's SPL facility for 2018 using supplier-specific data collected from wellhead through ocean transport. This analysis is the first of its kind in customizing emissions data sources across the supply chain to derive a representative profile of an LNG firm's life-cycle GHG emissions. The improvements to life-cycle GHG emission methodologies made in this work are:

1. Data from specific producers and transporters of natural gas from wellhead to liquefaction: Emissions are reported for the specific supply chain used by Cheniere and include operational data that enable a more accurate estimation of emission intensities.
2. Supplier-specific liquefaction data: Most previous assessments have used generic engineering analyses of liquefaction; this work uses supplier-specific liquefaction emission intensity data.
3. LNG ocean transport: generic operating assumptions (e.g., the type, propulsion system, and size of ships used to transport LNG) are replaced with actual fleet data collected from operations.

This supplier-specific approach to assessing life-cycle GHG emissions moves away from generic default data inputs to reduce uncertainties around emission intensity estimates. By working with their supply chains to gather data, LNG suppliers can better characterize the full scope of their GHG emission intensities and identify opportunities for emission abatement. By demonstrating how to develop a supplier-specific LCA for LNG, this work suggests LNG LCA accounting methods that can be relied on for future policy initiatives.

## METHODS

GHG emissions are estimated for the LNG supply chain for the SPL facility. The primary functional unit is 1 tonne LNG shipped to a destination port; however results are also reported for functional units of 1 tonne LNG liquefied, 1 tonne LNG regasified at a delivery port, and a mega-watt hour (MWh) of electricity generated in a destination market. We present a case study of LNG delivery to China for use in electricity generation, comparing LNG used for natural gas power generation with coal power generation on an equivalent MWh basis to highlight the importance of upstream (wellhead to regasification) emissions. The analysis accounts for emissions from the following natural gas industry segments: production, gathering and boosting (G&B), processing, transmission compression, transmission storage, transmission pipeline, liquefaction, ocean transport, regasification, foreign pipeline transmission, and power generation (SI 1−5). Figure 1 illustrates the study boundaries considered in this paper, alongside the life-cycle scaling approach.

The LCA is conducted in accordance with the International Organization for Standardizations (ISO) 14040, 14044, and 14067 standards (SI 16).[32−34] The model is structured using a unit process approach and accounts for over 125 unique sources of greenhouse gas emissions and over 50 unique unit processes (SI 2−5). Using a unit process structure for each emission source, the energy and material flows are accounted from a bottom-up emission source basis to a facility and segment within the supply chain. The LCA model constructed in this study is based on the publicly available National Energy Technology Laboratory (NETL) upstream supply chain model for the production, G&B, processing, transmission and storage (here referred to as upstream) operations.[35] The upstream model was populated with parameters representing Cheniere's SPL supply chain, using Subpart W of the Environmental Protection Agency (EPA) Greenhouse Gas Reporting Program (GHGRP) as the key activity and emissions data source.[36] Several improvements were made to the underlying NETL model to better represent Cheniere's SPL supply chain, reflect the current state of the science, and incorporate additional GHGRP emission data (vintage 2018, detailed in SI 2.9). These improvements were complemented with the inclusion of additional


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data from suppliers on key emission sources at facilities not required to report to the GHGRP, ensuring representativeness of operations and complete accounting of sources (SI 1 and 2). Statistical bootstrapping was used to create parameter distributions of the average value for each supplier-informed parameter. These parameters include total emissions, activity data (e.g., counts of equipment, volumes of fuel used), and throughput data. Statistical methods are further explained in SI 2.1 and parameters are documented in SI 2.10.

Our study employs a combination of the ONE Future Methane Emission Estimation protocol and the Natural Gas Sustainability Initiative (NGSI) Methane Emission Intensity protocol to handle the co-production of condensate and gas in upstream operations.[16,37] We use a combination of partitioning (assigning an emission source wholly to a specific product—gas or liquids) and energy-based allocation (apportioning an emission source to co-products based on their energy content). We more closely align with the ONE Future partitioning and allocation method, with four deviations: associated gas venting and flaring, completion and workover venting, and liquids unloading venting emissions are energy allocated in our work between the produced gas and lease condensate streams. Further, we use partitioning to account for fugitives at production and G&B, detailed in SI 2. As outlined in the NGSI protocol, for production and G&B energy allocation, this study assumes 1.235 million British thermal units (MMBtu)/thousand cubic feet (Mcf) of produced gas (before removal of natural gas liquids) and 5.8 MMBtu/barrel (bbl) for lease condensate.[37] For processing facility emission energy allocated between pipeline quality gas and natural gas liquids (NGLs) exiting the facility, we assume 1.031 MMBtu/Mcf for pipeline gas and 3.82 MMBtu/bbl for NGLs (as outlined by NGSI).[37] To further align with these protocols, the NETL model was modified to include emission modeling for associated gas venting, associated gas flaring, and atmospheric storage tanks. These and other updates are documented in SI 2.

A new liquefaction unit process was created using facility-specific emissions and energy consumption data for SPL using the GHGRP Subpart W and Subpart C (see SI 3 for details). A new model of ocean transport was developed using 2018 voyage log and proprietary vessel data for cargos loaded with Cheniere SPL LNG in 2018. The voyage log data were used to estimate the market-level weighted average ocean transport intensity of all cargoes loaded at SPL in 2018 and delivered to a foreign port. All data sources and calculations are documented in SI 4. Regasification, foreign transmission, and power generation unit processes were built from published literature, third-party data sets, and engineering estimates, which are further detailed in SI 5.

The results are compared to an LCA of Chinese coal power generation, using recently published data on Chinese coal mine methane (CMM) and coal power plant fleet average efficiencies, with both parameters highly regionalized.[38−41] This modeling work is further documented in SI 8.

Total GHG emissions are estimated using the IPCC Fifth Assessment Report (AR5) global warming potentials (GWP) for methane and nitrous oxide ($N_2O$). To reflect the different climate impacts of these GHGs across timescales, we present results across the two typically used timescales, 100 year ($CH_4$ = 36 $gCO_2e/gCH_4$, $N_2O$ = 298, $CO_2$ = 1) and 20 year ($CH_4$ = 87, $N_2O$ = 268, $CO_2$ = 1). These factors account for both the climate-carbon feedback effects as well as $CO_2$ produced from atmospheric methane oxidation.[42]

The framework presented in this study improves previously published LNG studies by customizing supply chain operations from production to the regasification plant. Past studies have employed regional (e.g., oil and gas basin) or national level for upstream (production through transmission) emission factors or activity data and use generic, engineering-based estimates of liquefaction and ocean transport for the LNG supply chain. Our supplier-specific LCA employs facility-level emissions and operations data for the known gas suppliers upstream of SPL liquefaction and models actual operations for the SPL facility and each unique LNG cargo loaded and shipped at SPL in 2018 using cargo-specific data. No previous LCA of LNG has customized the supply chain to this level.

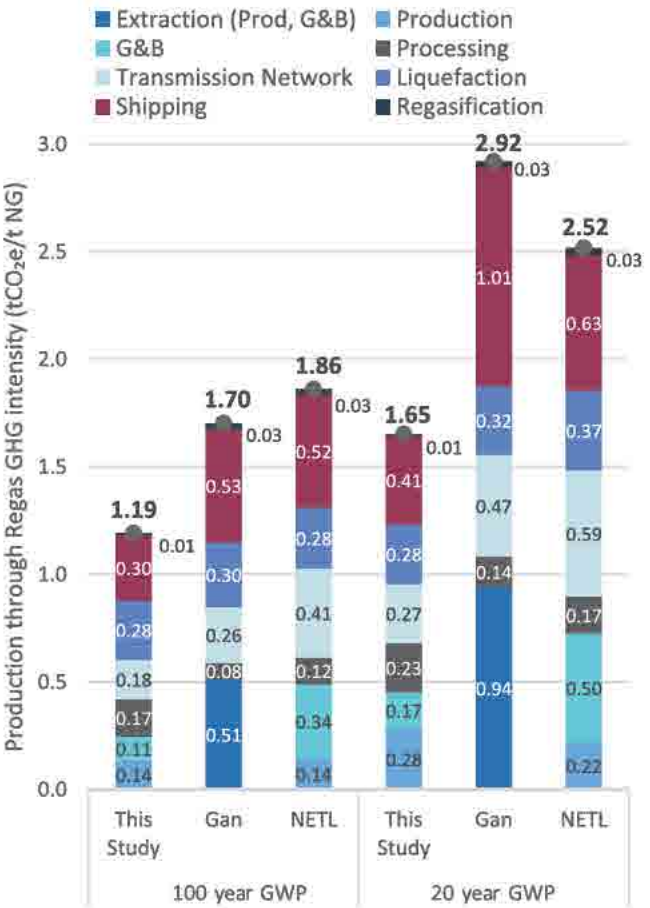



**Figure 2.** Greenhouse gas emission intensity, attributed to individual life-cycle stages for this work, compared to two similar assessments of emission intensity from U.S. LNG transported to China (Gan et al.; NETL).[10,26] While each of the studies estimated an uncertainty range around the expected result in the original published work, the data for Gan et al. and NETL were not published with sufficient granularity to allow error bars to be reconciled and shown in this work on a comparable basis.

## RESULTS AND DISCUSSION

Figure 2 displays GHG emission intensity results for the Cheniere SPL supply chain up to regasification in China and compares to two similar assessments of emissions intensity from the U.S. LNG transported to China (Gan et al.; NETL).[10,26] This study estimates a GHG intensity 30−43% lower than the Gan et al. study, and 34−36% lower than the NETL study considering the 100 and 20 year GWP time horizons. The Gan et al. result is the average of 21 scenarios for U.S. LNG exported from the Gulf Coast to China, with each scenario representing a different U.S. production techno-basin (combination of natural gas basin and extraction technology). The NETL scenario models Appalachian Shale gas as the gas source, and LNG exported from the Gulf Coast region. The reconciliation performed to allow equivalent comparison of the NETL and Gan et al. studies with this study is documented in SI 9.

Emissions from the production and gathering and boosting stages for this study are approximately 52% lower than the estimates by Gan et al. on both the 100 and 20 year basis, and 38−50% lower than the estimates by NETL on the 20 and 100 year time horizons, respectively. There are two key reasons for these differences. First, there are differences in data vintage included in each assessment. Gan et al. rely on upstream data


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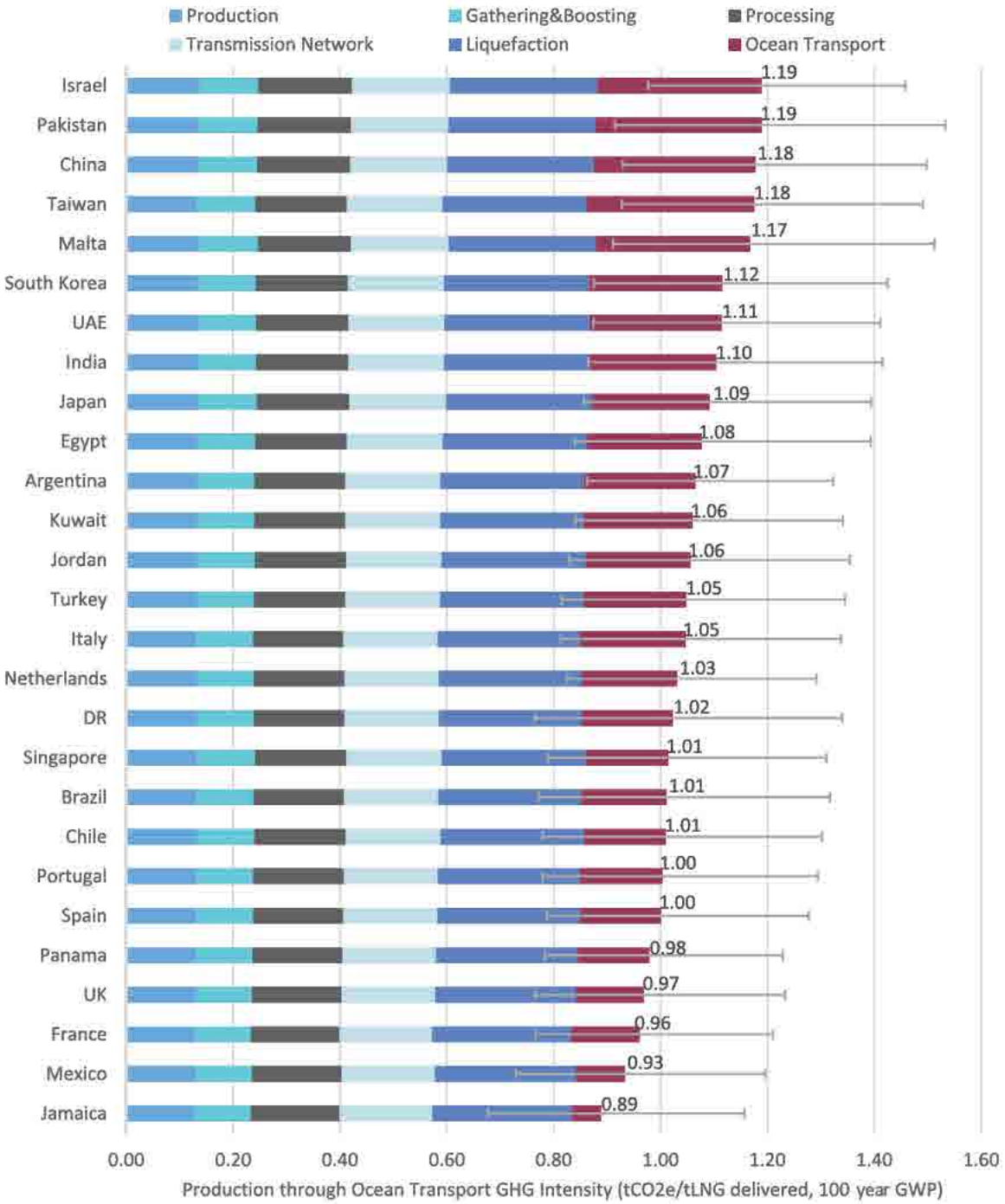



**Figure 3.** GHG emission intensity from production through ocean transport by market; ocean transport emission intensities range from 0.05 $tCO_2e/t$ delivered and a 6% contribution to the life cycle total (Jamaica) to 0.31 $tCO_2e/t$ delivered and a 27% contribution (Taiwan). Since emissions are normalized to per tonne of LNG delivered, we observe differences in the upstream GHG intensity. Though the upstream supply chain modeled is the same for each scenario above, the losses (consumption of natural gas) during ocean transport vary among the scenarios, leading to differences in the calculated GHG intensity of production through liquefaction when the supply chain is normalized to LNG delivered.

collected in 2012 (published in the 2016 NETL upstream report[43]), while the supplier-specific data reported in this work are from 2018. In 2018, additional regulations have required the use of reduced emission completions and other emission reductions compared to 2012,[44,45] and production-stage GHG emissions have been reported to be reduced by 50%.[46,47] Second, emission intensities among the producers in Cheniere's supply chain are lower than the basin-level average characterization in Gan et al. Figure 2 shows the average of the 21 U.S. LNG scenarios modeled in Gan et al. (extraction intensity 0.51 $tCO_2e/t$ regasified on a 100 year basis), but the scenarios span a wide range of extraction intensities from 0.22 (Gulf of Mexico Offshore gas) to 1.06 (North Central shale gas source) $tCO_2e/t$ regasified. The Cheniere supply chain average extraction emission intensity, for reference, is 0.25 $tCO_2e/t$ regasified.

The NETL 2019 study uses more recent production emission data (2016 data) than Gan et al. and is based on natural gas production in Appalachia with relatively low emission intensity.


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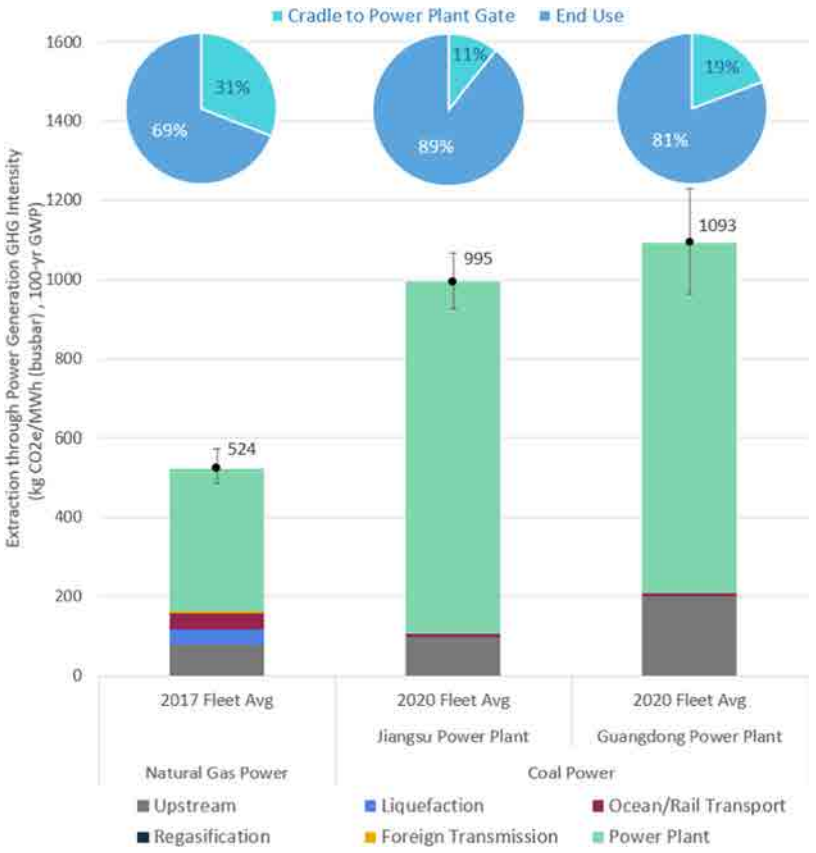



**Figure 4.** Comparison of the supplier-specific natural gas power generation scenario to coal-fired power generation at two locations in China. The stacked-bar portion of the figure shows the stage-level contribution to the cradle through power generation (busbar) GHG intensity. Above each bar is a pie chart that shows the percent contribution of end use (power plant) vs cradle to power plant gate supply chain emissions.

The NETL analysis differs from this study primarily in the G&B and transmission stages. The differences in G&B intensity appear to be driven by differences in individual facility performance. To model transmission compression, the NETL model uses a factor of 0.97 horsepower-hour (HPh)/Mcf to estimate the transmission station throughput (derived from NETL published parameters). The average ratio of HPh to Mcf of throughput, from Cheniere's known suppliers, is 0.27 HPh/Mcf, based on supplier data collection done in this work. For modeling gas from other transmission operators, the GHGRP does not publicly provide the throughput of compressor stations so this study assumes 0.29 HPh/Mcf based on data from the Energy Information Administration (EIA) and Inventory of U.S. Greenhouse Gas Emissions and Sinks (GHGI). The higher factor used in the NETL work results in increased fuel consumption across the transmission network. The updates to transmission compression are further discussed in SI 2.

Cheniere's liquefaction GHG intensity is 8−13% less than that estimated by Gan et al. and is comparable to the NETL study estimate on a 100 year basis. This study models liquefaction directly using SPL emission reporting and operational data from 2018. Details are provided in SI 3. Gan et al. also based their figures on SPL but used prospective estimates from the 2011 Environmental Assessment report when SPL was not yet operational.

The Cheniere ocean transport stage emission intensity is 42−60% less than Gan et al., 100 and 20 year GWP, respectively. Compared to NETL, ocean transport emission intensity is 42−35% less, based on 100 and 20 year GWP, respectively. Our study utilizes recorded fuel consumption and proprietary vessel and third-party data collected from LNG carrier voyages in 2018, whereas NETL and Gan et al. base their emission calculation on a theoretical ship of a specific size and propulsion system, estimating the voyage duration based on distance and speed assumptions. Further, Gan et al. assume that 20% of all generated boil-off gas (BOG) is emitted to the atmosphere (it is unclear whether this is fugitive, slip, or venting emissions). Based on guidance from industry experts, our model assumes all BOG is used for propulsion and to meet vessel's electric load demand ("hotel load"), where engine slip is 0.10−3.13% of engine throughput, depending on the propulsion system.[48] Detailed voyage-specific operational data enables accurate accounting of key parameters, including BOG management rates and propulsions systems, resulting in much-improved assessment of the ocean transport segment. Fugitive emissions from LNG carrier operations are assumed negligible based on an understanding of operational practices, but no data is yet available for corroboration. Further, while this study accounts for variability in efficiency and methane slip across propulsion types, the impact of methane slip from the smaller auxiliary engines is unknown. This study accounts for total fuel demand for both the laden and ballast voyages (used for propulsion and hotel load) but assumes that all fuel is combusted in the main engine propulsion system. The difference in emission performance between the larger, continuous propulsion engines and the smaller generator engines is understudied and an opportunity for improvement in the modeling of LNG ocean transport.

The results in Figure 2 demonstrate the importance and value of supplier-specific LCA. Modeling a national- or regional-level average of the natural gas production through the transmission


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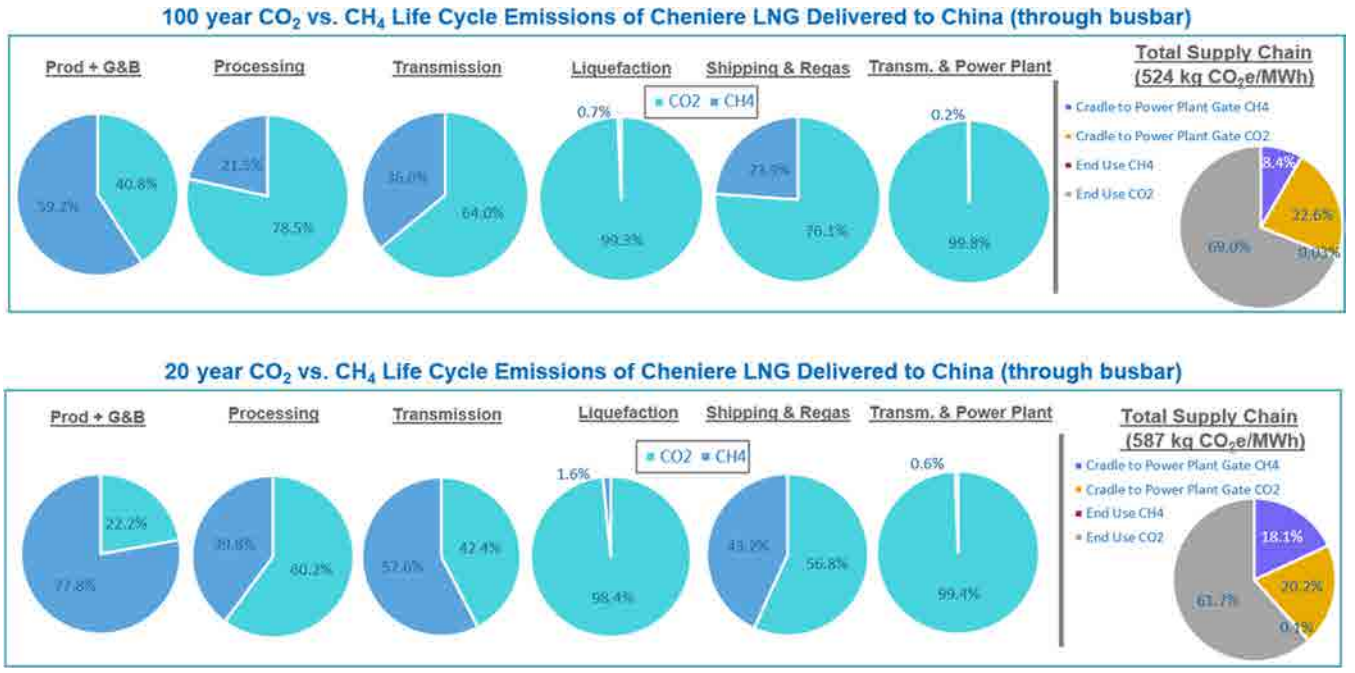



**Figure 5.** Contributions of $CO_2$ and $CH_4$ on a $CO_2e$ basis across the supply chain stages for natural gas.

supply chain is not representative of each unique supply chain due to the significant variability in individual operator performance primarily driven by the source and transport of the natural gas and LNG. While for this specific year and supply chain, the customized LCA resulted in a lower GHG intensity than other study estimates, there will also be supply chains with greater GHG intensity than the average, depending on the sourcing and transportation of gas and LNG. Understanding this variability will be critical for characterizing the true emission intensity of different LNG supply chains and enables differentiated LNG supply for natural gas consumers with climate goals.

**LNG Market Customization.** Figure 3 shows the market-level weighted average GHG intensity from wellhead production through ocean transport for the 27 markets which received LNG from SPL in 2018. The error bars represent the 95% confidence interval in the average result, capturing uncertainty and variability across the supply chain. The ocean transport model created for this study models at the individual round trip voyage level, allowing for a unique emissions profile for any cargo. Individual cargos were weighted by the volume of LNG delivered to the regasification terminal to obtain a market average. These market-level averages demonstrate the varying contribution of ocean transport to the production through ocean transport life-cycle intensity. This difference is driven by a combination of voyage distance and the propulsion system of the LNG carrier. Within a given market, there is often variability between the GHG intensity of individual voyages due to voyage duration, as well as differences between vessel performance. Further, we see how influential the individual cargo performance can be on the GHG intensity. Pakistan and India share similar voyage lengths, but Pakistan's GHG intensity is 8% higher on a production through ocean transport basis. The effect of a ship's propulsion system is explored further in SI 4, using the United Kingdom (U.K.) and China as case studies.

**Natural Gas End Use.** Figure 4 exhibits the GHG emission intensity from the Cheniere SPL LNG supply chain through power generation in China, compared to coal power generation as a case study. Two coal scenarios are modeled since coal mine methane (CMM) emissions differ significantly between northern and southern China: the Jiangsu scenario represents coal mining and power generation in a northern province; Guangdong represents a southern province.[38] The LNG scenario represents Cheniere's weighted average supply chain of SPL export to China in 2018, weighting individual cargoes based on LNG volume delivered, modeled with a fleet average power plant efficiency of 2017 vintage due to data limitations (see SI 5 for details).[49] The error bars represent the 95% confidence interval in the average result, capturing uncertainty and variability across the supply chain.

Similar to the variation in methane emissions from natural gas, CMM emissions in China can vary by more than an order of magnitude across source regions and whether a mine is subject to methane outbursts. The GHG intensity of the upstream coal supply chain ranges from comparable to more than double the Cheniere upstream LNG supply chain. While out of the scope of this study, it will be important to characterize supplier-specific emissions for coal in future research, similar to what is done for natural gas in this study. The provincial average extraction data for northern coal-producing provinces near Jiangsu and Southern coal-producing provinces near Guangdong is combined with provincial average data on power plant performance for Jiangsu and Guangdong to generate the levelized GHG intensity.[40] The GHG intensity of the supplier-specific natural gas power scenario is estimated to be 47−52% less intense than the regional coal power generation scenarios on an equivalent MWh basis, 100 year GWP basis.

For the LNG supply chain, the majority of the GHG emissions occur at the power plant during combustion for power generation and are a function of the power plant efficiency and fuel composition. However, the production to power plant gate emissions are significant, ~31% of $CO_2e$ on a 100 year basis and ~38% on a 20 year basis for LNG exported to China for power (20 year GWP results shown in Figure 5 below). Given the


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Table 1. Supply Chain GHG Intensity Results for the Four Boundaries Examined in This Study, Cradle through Liquefaction, Ocean Transport, Regasification, and Power Generation[a]

| | 100 year | | | 20 year | | | |
|---|---|---|---|---|---|---|---|
| boundary | P97.5 | exp | P2.5 | P97.5 | exp | P2.5 | units |
| cradle through liquefaction | 1.05 | 0.82 | 0.63 | 1.51 | 1.15 | 0.86 | t/t liquefied |
| cradle through shipping (China) | 1.5 | 1.18 | 0.93 | 2.12 | 1.64 | 1.26 | t/t shipped |
| cradle through regasification (China) | 1.51 | 1.19 | 0.94 | 2.13 | 1.65 | 1.28 | t/t regasified |
| cradle through power generation (China) | 573.2 | 524.4 | 485.9 | 657.9 | 586.8 | 531.2 | kg/MWh (busbar) |

[a]Results are shown on a $CO_2e$ basis for the China supply chain.

significance of emission upstream of the power plant for the natural gas supply chain, supplier-specific estimates of GHG intensity will be critical for analyzing differentiated gas supplies.

Figure 5 breaks down the relative contributions of $CO_2$ and $CH_4$ on a $CO_2e$ basis across the supply chain stages for natural gas. The majority of $CH_4$ emissions occur in the production, processing, transmission, and shipping segments of the supply chain, with methane emissions accounting for about 60% of the production profile. Impacts of methane emissions are amplified under the 20 year basis. The majority of the emissions occur at the power plant during combustion for power generation and are a function of the power plant efficiency and fuel composition. A similar breakdown of $CO_2$ vs $CH_4$ is provided for coal supply chains in SI 12.

To summarize the baseline results of this study, Table 1 shows the 100 and 20 year GWP GHG intensities of the four boundaries examined in this study, using electricity generation in China as an end-use example. A detailed breakdown of results by the supply chain stage can be found in SI 13.

**Sensitivity Analysis.** This work demonstrates that the use of current supplier-specific data is vital for accurately accounting for the variability of GHG emissions from natural gas. As methane emissions are reduced further in response to regulations (e.g., from the US,[44,45] EU,[18] Mexico,[50] and Canada[13]), voluntary initiatives (e.g., EPA Methane Challenge ONE Future and BMP,[51] OGMP 2.0[14]), and through corporate GHG commitments, these estimates should evolve. The baseline methane emission intensity expressed as mass of methane emissions per mass of LNG exiting liquefaction from this work is estimated to be 0.65% (SI 11). To investigate the impact of methane emission reductions on GHG emission intensity ($CO_2e$), a sensitivity analysis was performed on methane emission sources in production, G&B, processing, and transmission operations. The modeled baseline represents the 2018 average of Cheniere SPL's production through liquefaction supply chain. Methane emissions were reduced by fixed percentages to be technology-agnostic. Figure 6 shows the production through liquefaction life-cycle GHG emissions intensity (for 100 and 20 year GWP) as upstream methane emissions are reduced by up to 50% relative to the baseline of this study (wellhead through liquefaction boundary). A 50% reduction in methane emissions translates to a 14% decrease in 100 year $CO_2e$ emissions (wellhead through liquefaction) and 24% decrease in 20 year $CO_2e$. The ideal emission mitigation approach will be supplier-specific, targeting the unique characteristics of each facility. This points to the importance of supplier-specific LCA as a decision-making tool for emission mitigation.

Another sensitivity analysis is conducted to assess potential sources of under-reported emissions within the GHGRP, as identified in recent studies by Lyon et al. and Rutherford et al.[52,53] These analyses demonstrate how discrepancies in

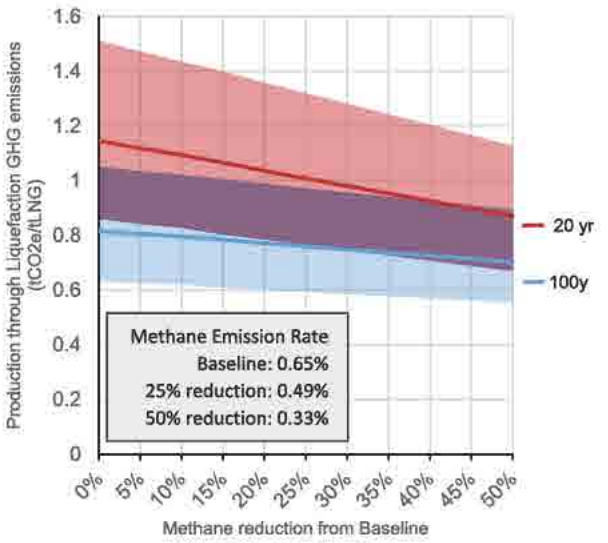



Figure 6. Impact of decreases in methane emissions on production through liquefaction life-cycle greenhouse gas emission intensity; a 50% decrease in wellhead through transmission methane emissions translates to an estimated methane emission rate of 0.33% (wellhead through liquefaction basis). The shaded blue region represents the 95% confidence interval in the average value for the 100 year GWP. The shaded red region represents the 95% confidence interval in the average value for the 20 year GWP. Where the 100 and 20 year confidence intervals overlap, the area is shaded purple.

emission inventories and top-down studies can be reconciled in part with improved emission factors and assumptions on operations. Here, we investigate the sensitivity of the supply chain to production and G&B fugitive emission factors, emissions from tank thief hatches and other gas release points from tanks, and flaring efficiency in the Permian oil and gas production region in the U.S. The GHGRP assumes flaring emissions from a destruction efficiency of 98% and relies on national average values per source for fugitive emission factors, both of which have been shown to vary widely by Lyon et al. and Rutherford et al. When the Permian flare efficiency is modeled as 93% for known suppliers, the net effect on the GHG intensity in this study is less than a 1% increase on a 100 year GWP basis (wellhead through regasification basis) since the SPL supply chain had relatively few Permian basin suppliers in 2018. Modeling deterministically the average fugitive emission factors proposed by Rutherford et al. results in a less than 1% increase in the GHG intensity on a 100 year GWP basis (wellhead through regasification basis). However, as described in SI 7, uncertainty surrounding emission factors used for production and G&B fugitives may lead to larger impacts. Finally, the sensitivity on atmospheric storage tank thief hatches and other gas release points on tanks resulted in a 5−6% increase in production


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through regasification GHG intensity on a 100 year GWP basis. Sensitivity analyses and results are further documented in SI 7.

This work utilizes the most granular level of supplier activity data available and employs the latest state of the science on GHG emissions. However, we recognize that there are limitations to the data and opportunities for future improvement. We address the known limitations of the GHGRP emission factors through a sensitivity analysis on modeled parameters.[52−54] The supplier-specific supply chain model is limited by the lag in data reporting from the GHGRP (data is generally published in the third or fourth quarter of the following year, i.e., 2018 data becomes available toward the end of 2019) as well as the unknown surrounding gas purchased from nonoperators (e.g., marketers). These volumes purchased from nonoperators are currently modeled using a US average intensity, but future efforts will focus on improving this understanding.

**Policy Implications.** This study highlights the wide differences in emissions intensities across different supplier routes at a time where interest in accounting for embedded emissions is growing among companies, policymakers, and investors.[55] In the European Union, policymakers are contemplating the development of a Carbon Border Adjustment Mechanism and a Methane Supply Index (MSI) to compare the GHG and methane footprint of different gas supplies for future policy considerations and "empower buyers to make informed choices."[56] The Japanese government has launched a review of its policies related to meeting its 2050 carbon-neutral target, including potentially embarking a carbon-neutral roadmap for its LNG supply chain.[57] Meanwhile, investors have become more focused on climate-related disclosures, including GHG emissions, as evidenced through broader adoption of frameworks such as the Taskforce for Climate-Related Disclosures (TCFD) and alignment of investment portfolios with Paris Agreement goals.[58]

Such market and policy trends are nascent but not hypothetical. At least two long-term LNG supply and purchase agreements that include statements of GHG emissions have been signed, and over a dozen carbon-neutral LNG (CNL) commercial transactions have been undertaken recently (see SI 14).[59,60] A group of major Japanese LNG buyers have formed a Carbon-Neutral LNG Buyers Alliance to support the greater use of CNL.[61] CNL combines the delivery of LNG with offset credits commensurate with its estimated life-cycle emissions footprint. Kasumu et al. observe that trade agreements could do a better job accounting for embedded emissions and using an LCA for LNG emission accounting.[62]

Quantified GHG emissions, CNL, and future market transactions first require improving buyer confidence in the comprehensiveness and accuracy of emission assessment and reporting, and such assessments are only as effective as their ability to account for all relevant GHG emissions from each segment across the natural gas supply chain. More discerning consumer demand may therefore stimulate the private sector to improve emission estimates.

As such, public[35] and private GHG accounting for the LNG supply chain would benefit from a level playing field with a common set of transparent supplier-specific standards for LNG emission accounting. For instance, minimum requirements in accounting for emission sources within each supply chain and transparent data sources and modeling assumptions would strengthen accounting foundations. The U.S. benefits from robust and transparent regulatory reporting of GHG emissions data via GHGRP, which can be further improved by additional QMRV measures.

Harmonized data collection and reporting would build confidence in supplier claims about LCA emissions, enabling comparisons between natural gas supply chains and supporting climate goals for all participants in the supply chain. This could stimulate a virtuous cycle of demand for GHG accounting and reduction and provision of more granular, company-specific emissions estimates.

## CONCLUSIONS

As countries and companies develop climate goals, it is vital to have consistent and transparent analytical frameworks to account for emissions across the life cycle of the product. Natural gas and LNG supply chains are highly variable; as such, this work demonstrates the benefits of a customized LCA rather than relying on generic national or regional data. This study conducts a supplier-specific LCA of Cheniere's SPL LNG supply chain that advances the understanding of life-cycle LNG GHG emissions, demonstrates the improved accuracy of actual data vs modeled assumptions, informs areas for mitigation of GHG emissions, and presents an LCA framework that can be adopted by other stakeholders.

The results demonstrate improved emission intensity estimates between this specific supply chain and ones modeled using national averages and generic assumptions. This study finds a 30−43% decrease in GHG intensity relative to other studies employing generic national or regional data (wellhead to regasification). This is significant, as our study demonstrates that emissions upstream of end use (production to power plant gate) account for ∼31−38% of GHG emissions from cradle through power generation (100 and 20 year GWP, respectively, LNG export to China supply chain).

The study also produces a unique ocean transport model using representative fuel and emission data from LNG transport routes out of SPL in 2018. Results show that ocean transport emission intensities are ∼35−60% lower than other studies, and there exists high variation across transport routes and ship propulsion technologies.

Further, this study finds a methane emission rate, wellhead to liquefaction, of 0.65%. A sensitivity analysis on methane emission reductions estimates that a 50% reduction in upstream methane would result in a 14−24% reduction of supply chain emissions (wellhead to liquefaction, $CO_2$e 100 and 20 year GWP basis, respectively).

In addition to demonstrating the value of a customized supply chain LCA, this work has important implications for methane's role in the LCA of LNG. While $CO_2$ is a significant portion of total GHG emissions on a $CO_2$e basis, these emissions are well understood and occur primarily at the power plant or during other (easily estimated) end-use combustion activities. Conversely, $CH_4$ emissions are more variable and less understood. Also yet, there is a growing recognition that methane emissions—which occur largely upstream of the power plant—also constitute a significant portion of $CO_2$e life-cycle emissions for the LNG supply chain, 8.4% of cradle to power generation emissions on a 100 year GWP basis and 18.1% on a 20 year GWP basis for China. Similarly, we observed the upstream of end use methane impact in coal supply chains (primarily from CMM), which constitutes ∼10−35% of total $CO_2$e on a cradle to power generation basis for the two Chinese coal provinces investigated (100−20 year GWP, as shown in SI 12). Improving our understanding of methane emissions will be


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critical for modeling differentiated LNG and natural gas supply chains and therefore gaining a more accurate accounting of emissions from LNG.

As policymakers and companies develop their climate strategies, it is imperative to accurately account for supplier-specific emissions, include all relevant emission sources, and employ appropriate practices for allocating between liquid and gas supply chains. Enhanced QMRV measures across the gas and LNG supply chain will improve GHG estimates employed as part of a customized LCA model. A customized LCA allows for more accurate understanding of GHG emissions if the underlying data is robust and the methodology consistent, and serves as the baseline for the next step toward designing appropriate policies and corporate strategies to transition to a lower carbon future.

Commercial preferences may also inform public policy at domestic and international levels, leading for instance to integration of climate and trade policy. GHG emission accounting frameworks will be increasingly important as the industry navigates competitive landscapes between those jurisdictions that do and those that do not account for emissions.[63] Taken together, these evolving commercial and public policy trends are moving in the same direction—greater incentives for robust, transparent, bespoke, and verifiable LCAs.

## ■ ASSOCIATED CONTENT

### ● Supporting Information

The Supporting Information is available free of charge at https://pubs.acs.org/doi/10.1021/acssuschemeng.1c03307.

Details of emission estimation methods, sources of activity data and emission factors, and sensitivity analyses (PDF)

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**From:** Skone, Timothy
**Sent:** Wed, 26 Apr 2023 20:05:20 +0000
**To:** Blackhurst, Michael (NETL); Jamieson, Matthew B.
**Subject:** RE: GCAM data for LCA analysis
**Attachments:** GCAM LCA Data Categories_2023.04.20.xlsx

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Mike and Matt,

As part of my investigation of the GCAM files, I summarized the categories of data provided by each data set. Sharing for internal purposes. This helped me see how the data relates and what is reported.

Tim

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**From:** Skone, Timothy
**Sent:** Wednesday, April 26, 2023 3:36 PM
**To:** 'Blackhurst, Michael (CONTR)' <Michael.Blackhurst@netl.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** RE: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Mike and Matt,

Below is my complete set of questions for PNNL.

Tim

1. Chem-in
    a. Any detail for "Chemical Energy Use"?
    b. Any detail for "Chemical feedstocks"?
2. Elec_cons
    a. Input, confirm that "td" in "elect_td_ind" means includes transmission and distribution losses and therefore the value is the amount of electricity consumed, Yes/No?
    b. Sector and Input use the abbreviation "trn", what does it stand for?
        i. Transport/transportation?
    c. What does "trn_shipping_intl" refer to?
3. Final_en_cons (final energy consumption, EJ)
    a. Input: district heat
        i. how do you model district heat production? Form coal, NG, oil, biomass, etc?
    b. Sector: Cement
        i. Only identifies one input, electricity. This seems odd as cement generally consumes fossil fuels for heat production. Would these other energy inputs be in another sheet?

ii. NEW: there is an entry for "process heat cement" I believe this answers my question above. True/False?

c. Sector: CO2 removal, Input: process heat dac
   i. What is the energy form assumed in GCMA to produce "process heat dac"?
   ii. NEW: there is a sector called "process heat dac, Input: gas", I believe this answers my question, 100% NG driven DAC globally with a small amount of local electricity.
   iii. Please confirm: DAC is modeled as one type, using both NG and electricity in the model.

d. Sector: construction feedstocks, Input: refined liquids
   i. How does this differ from "Sector" construction energy use, Input: refined liquids"?
      1. The concern is double counting. Should we model it as "Construction feedstocks being linked to construction energy use? If so, all energy or only refined liquids?

e. Sector: resid heating (residential heating)
   i. What is the difference between Input type "Traditional biomass" and "biomass"?
      1. Traditional biomass = firewood
         a. Soft and hard wood mix?
      2. Biomass = ???
         a. Note, "biomass" is not a residential heating input type but is used in other sectors as a fuel input type.

f. Sector: trn_freight versus trn_freight_road
   i. Any description for trn_freight to align LCA emissions data?

g. Sector: trn_pass versus trn_pass_road
   i. Any description for trn_pass to align LCA emissions data?

h. Sector: trn_shipping_intl
   i. Input: only electricity, hydrogen, and refined liquids are identified as inputs, is LNG boil off as natural gas during transport tracked differently (or somewhere else) for final energy consumption for transportation?

4. Final_en_price
   a. Delivered gas versus wholesale gas
      i. Does "delivered gas" mean through the local distribution network, low pressure gas?
      ii. Does "wholesale gas" mean delivered through the transmission network only, high pressure gas delivered to large end users?
   b. How does final energy price for "delivered gas" and "wholesale gas" relate to LNG price in GCAM?
   c. Fuel: elect_td_bld
      i. Is the same electricity price used for "bldg" apply to commercial and residential buildings?
         1. Note, industrial and transportation have separate electricity costs in the file.
   d. Fuel: H2 wholesale delivery versus H2 wholesale dispensing
      i. Are these additive? Or "H2 wholesale dispensing" minus " H2 wholesale delivery" equal only the H2 wholesale dispensing cost?
         1. Confirming to avoid double counting.

5. Gas_cons
    a. Sector: csp_backp
        i. Confirm what "csp" refers to?
            1. Concentrated solar panels?,
            2. If so, then the back-up gas combustion technology would be a simple cycle gas turbine.
    b. Sector: H2_wholesale_dispensing
        i. Does this only cover "dispensing"? One would expect this to be electricity versus gas.
        ii. How is gas consumption for hydrogen production accounted for?
6. Gas_cost
    a. Sector: gas processing -- only one sector identified
        i. What do these costs represent for:
            1. Subsector/technology: biomass gasification
            2. Subsector/technology: coal gasification
            3. Subsector/technology: natural gas
7. Gas_in
    a. Sector: gas processing -- only one sector identified
        i. What do these energy consumption values (IJ) represent for:
            1. Subsector/technology: biomass gasification
            2. Subsector/technology: coal gasification
            3. Subsector/technology: natural gas
        ii. Quantity of energy carriers processed (fuel input) to produce (not specified) amount of gas (natural and synthetic) using regional energy resources.
            1. If yes, which file has the amount of gas produced from each regional type of gas processing?
            2. NEW: confirm, "gas_prod" is the output file that reports the quantity of gas exiting the gas processing facility - this file complements "gas_in"
8. Gas_pipe
    a. File contains pipe_input and pipe_output by region in EJ
        i. What does the data reflect?
        ii. Quantity of gas input minus output = gas consumption plus losses?
        iii. For the same region, scenario, and year... generally the difference (input minus output) is slightly positive, but in some cases it is a negative value. What does a negative value represent?
9. Gas_prod
    a. Model lists three sources of gas (biomass gasification, coal gasification, and natural gas) what about landfill gas and municipal waste gas as a resource of renewable natural gas?
        i. Looking to understand how renewable natural gas may displace fossil-based natural gas - more important to Scenario 6 (net zero).
10. H2_prod
    a. Sector: H2_industrial
        i. Forecourt production, electrolysis
            1. What the energy/material inputs for this category?
                a. Wind/solar mix, other?

ii. Industrial hydrogen production today is mostly from natural gas as a material input; this does not show up as an industrial option. Where does petroleum refinery H2 production get accounted for?

b. H2 wholesale dispensing, forecourt production
   i. What does this represent?

c. Data is provided in term of "Vintage", can you provide details on how vintage is being adjusted by year for each technology (and region if applicable)?
   i. Efficiency of hydrogen production value? Other?

11. Iron_in
    a. Input, H2 industrial
       i. This linkages is to H2 electrolysis - this seems odd for iron and steel H2 production. Confirm this is the only H2 source for iron and steel production.
12. Luc_em
    a. Units, MTCO2/yr
       i. Metric Tons of Carbon Dioxide - is this the only inventory item reported for land use change?
       ii. How is methane and N2O emissions form land use change reported?
       iii. If CO2 is CO2...
            1. Is there more speciation detail (cO2, methane, N2O)?
            2. What IPCC GWP values are used to convert to CO2 equivalents?
13. Non_co2_em_tech
    a. Can the data be provided in multiple files based on the following sectors:
       i. Agricultural energy use
       ii. Commercial
            1. Comm cooling
            2. Comm heating
            3. Comm others
       iii. Construction energy use
       iv. H2
            1. H2 central production
            2. H2 wholesale dispensing
       v. Industrial
            1. Alumina
            2. Chemical energy use
            3. Industrial processes
            4. Iron and steel
            5. Mining energy use
            6. N Fertilizer
            7. Other industrial use
            8. Process heat cement
            9. Refining
       vi. Residential
            1. Resid cooling
            2. Resid heating
            3. Resid other
       vii. Transportation
            1. trn_aviation_intl
            2. trn_freight

3. trn_freight_road
4. trn_pass
5. trn_pass_road
6. trn_pass_road_LDV
7. trn_pass_road_LDV_4W
8. trn_shipping_intl

a. Other (how do these get assigned to an economic sector "user")?
   i. District heat
   ii. Electricity
   iii. Electricity_net_ownuse
      1. What is the scope of this sector and any direct relationships to other electricity use emission values to prevent double counting?
   iv. Urban processes
      1. What is this?
   i. Question - where would Direct Air Capture non-co2 emsisions from natural gas consumption be reported?

14. Trn_final_en
   a. There is a lot of sub-sector and technology detail for transportation. Any recommendations on how GCAM handles/reports/aggregates this data for reporting?
15. LNG_exp_GLO
   a. The file identifies 13 geographical regions, Is there additional disaggregated geographic representation for LNG exports?
      i. Example: Africa
         1. Africa_Eastern
         2. Africa_Northern
         3. Africa_Southern
         4. Africa_Western
      ii. Most data sets have 32 geographical regions reported.
16. LNG_imp_GLO
   a. The file identifies 13 geographical regions, Is there additional disaggregated geographic representation for LNG exports?
      i. Example: Africa
         1. Africa_Eastern
         2. Africa_Northern
         3. Africa_Southern
         4. Africa_Western
      ii. Most data sets have 32 geographical regions reported.
17. Geographical Region Cross-Reference
   a. Can you provide any geographical region aggregation matrices?
      i. Example: what is contained in the LNG_exp_GLO regional definition of "C Asia + Est Eur" versus "EU", etc.
      ii. LNG_exp_GLO, ROW = Rest of World, what countries are included in the ROW definition?
18. GCAM Energy Conversion Values
   a. Natural Gas, Bcf/d to EJ
      i. What condition is Bcf reported in?
         1. Standard Cubic Feet, 60 deg F, 14.7 psia (0 psig)
         2. Normal Cubic Meter, Natural Gas, 0 deg C. (converted to cubic feet)

        1. Liquefied Natural Gas Bcf/d to EJ
    ii. What conditions is Bcf reported in?
        1. Negative 160 deg C?

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**From:** Skone, Timothy
**Sent:** Tuesday, April 25, 2023 4:43 PM
**To:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** RE: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Mike,

Thursday morning at 9 AM works. I sent you and Matt an appointment. Below is my incomplete list of questions. I am still working through all of the files to familiarize myself with what is and is not there.

Tim

1. Chem-in
    a. Any detail for "Chemical Energy Use"?
    b. Any detail for "Chemical feedstocks"?
2. Elec_cons
    a. Input, confirm that "td" in "elect_td_ind" means includes transmission and distribution losses and therefore the value is the amount of electricity consumed, Yes/No?
    b. Sector and Input use the abbreviation "trn", what does it stand for?
        i. Transport/transportation?
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    c. Sector: CO2 removal, Input: process heat dac
        i. What is the energy form assumed in GCMA to produce "process heat dac"?
        ii. NEW: there is a sector called "process heat dac, Input: gas", I believe this answers my question, 100% NG driven DAC globally with a small amount of local electricity.
        iii. Please confirm: DAC is modeled as one type, using both NG and electricity in the model.
    d. Sector: construction feedstocks, Input: refined liquids

i. How does this differ from "Sector" construction energy use, Input: refined liquids"?
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            a. Soft and hard wood mix?
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            3. Subsector/technology: natural gas
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        i. Forecourt production, electrolysis
            1. What the energy/material inputs for this category?
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        ii. Industrial hydrogen production today is mostly from natural gas as a material input; this does not show up as an industrial option. Where does petroleum refinery H2 production get accounted for?
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        i. What does this represent?
    c. Data is provided in term of "Vintage", can you provide details on how vintage is being adjusted by year for each technology (and region if applicable)?
        i. Efficiency of hydrogen production value? Other?

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**From:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>
**Sent:** Tuesday, April 25, 2023 4:33 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** RE: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Hi Tim

Thanks for the guidance regarding including the disclaimers and correspondence.

Missing attachment included here.

We are still trying to understand the scope of the model by exploring the results such that I cannot yet tell if we have enough information to develop an adder.

Matt and I would like to coordinate questions, but Matt is unfortunately not available tomorrow. At the risk of a conflict with a pending meeting with OnLocation/PNNL, Matt and I are currently open Thursday 9 - 10 am and 2-230 pm and Friday 9 am to noon. Would these times work for you?

For the sake of completion, I'm adding question 8 "Can OnLocation/PNNL provide the file result "nonCO2 emissions by resource production?"

Best,

Mike

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**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Tuesday, April 25, 2023 3:31 PM
**To:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** RE: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Matt and Mike,

Thank you for the list of questions. I have a list of questions as well that I am working on…and not complete yet.

I did not receive an Excel attachment as noted below. Please send – thank you.

Do you want to meet and discuss any questions or directions before sending to OnLocation and PNNL?

You can email PPNL and OnLocation directly – but please copy me and Tom Curry. Paco, is the overall Project Manager, he should be copied on all correspondence as well.
All correspondence and files MUST BE MARKED as "DRAFT*DELIBERATIVE*PRE-DECISIONAL". Please ensure all work under this effort is marked accordingly.

Does the data provided give you everything you need from GCAM to design the LCA consequential adder?

The goal is to develop the procedure and model so that when the final scenario data is ready that you can drop the new results in and generate the results to meet the end of June timeline. Tom and FECM management are very interested in understanding "how" NETL will develop the consequential adder from the data. We will need to explain this in the near term (next few weeks).

| Identifier | Type[1] | Expected Completion Date | Description (What, How, Who, Where) |
|---|---|---|---|
| EY23.3.A | Project | 06/30/2023 | Draft GHG Intensity and Social Cost of Carbon result for each general equilibrium model scenario provided by ORS to assess LNG exports. Delivered to ORS for comment and review as Excel tabulated results. |

I am open tomorrow morning from 9:30 to 10:30 AM if you want to meet. If you do not want to meet, then go ahead and send your questions and copy Tom, Paco, and I.

Also – I will be on leave Friday afternoon thru Monday, May 8th.

Respectfully,

Tim Skone

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**From:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>
**Sent:** Tuesday, April 25, 2023 3:04 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Subject:** RE: GCAM data for LCA analysis

Hi Matt and Tim

I think I have a fair understanding of the files containing the GCAM results pending some questions below. Apologies if this is already familiar to you. Could one of you please forward to the GCAM team or suggest that I correspond directly with OnLocation and/or PNNL?

The most granular CO2 emission results are in the file "co2_em_tech_2023.04.20.csv," which are by scenario, region, sector, subsector, technology, and year. Summing emissions in this file by scenario, year, and region appears to match the results in the related file "co2_em_reg_2023.04.20.csv," which appears to capture the most aggregated emissions.

Question 1: Do both “co2_em_tech_2023.04.20.csv” and “co2_em_reg_2023.04.20.csv” account for the same scope of emissions?
Question 2: Do these files capture all CO2 emissions?

There are negative emission flows in both files. It is possible that “seq” in the file "co2_seq_tech_2023.04.20.csv" stands for “sequestration,” which could explain the negative flows. However, flows by sector in "co2_seq_tech_2023.04.20.csv" do not match my intuition of those sectors involving sequestration.

Question 3: What is in the file “"co2_seq_tech_2023.04.20.csv?"
Question 4: Are the results in this file already accounted for in “co2_em_tech_2023.04.20.csv” and/or “co2_em_reg_2023.04.20.csv?”
Question 5: If answers do not explain negative emissions, where in the results are negative emission flows?

The largest csv file ("non_co2_em_tech_2023.04.20.csv") includes a lot of non-CO2 emission species, some of which are also greenhouse gases. I have attached a spreadsheet that I prepared, pairing the different emission species with those reported by the EPA. The goal of this pairing is not necessarily to use EPA’s emissions factors but to understand what is reported by GCAM.

Question 6: Are the non-CO2 emissions converted to CO2 equivalents and then included in the results for CO2 per question 1 above?

It appears that the GCAM modeling team either misunderstood Matt’s request for vintage information or such granularity is not included in GCAM. All values for vintage in relevant files report only the modeled year (e.g., 2015, 2020, 2025, etc). I’ll look to Matt on how to respond accordingly. Maybe they could share related model assumptions or input data to help us understand what vintages are represented.

I attempted to merge the most granular CO2 estimates in “co2_em_tech_2023.04.20.csv” with the respective measures of throughput so we could back out the implied emissions factors. The intent was to gauge whether we want to suggest alternative factors. I was only able to match the granular CO2 estimates with respective granular throughout for about 35% of the results.

Question 7: Can OnLocation and PNNL please send the raw emission factors?

Finally, I spot checked some of the results in the Excel file originally sent to Tim and forwarded to us with the latest batch of csv files. I am sufficiently confident that these results are the same but would be happy to explore more upon request.

Please let me know if I can provide anything else by email or schedule a time to explore the model results together.

Best,

Mike

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Monday, April 24, 2023 2:01 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>
**Subject:** FW: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

In case I had not previously forwarded, attached is the original Excel file with LNG data provided by PNNL.

Tim

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**From:** Binsted, Matthew T <matthew.binsted@pnnl.gov>
**Sent:** Tuesday, April 11, 2023 4:02 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Wolfram, Paul <paul.wolfram@pnnl.gov>
**Subject:** RE: GCAM data for LCA analysis

Hi Tim,

As requested, attached please find the data from our updated GCAM scenarios.

Again, any feedback on the format, etc. is much appreciated. Please don't hesitate to reach out with any questions or requests.

Best,

Matthew

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Tuesday, April 4, 2023 2:59 PM
**To:** Binsted, Matthew T <matthew.binsted@pnnl.gov>
**Cc:** Wolfram, Paul <paul.wolfram@pnnl.gov>
**Subject:** RE: GCAM data for LCA analysis

Matt,

Received. Thank you. I will follow-up with you and Paul with questions and insights once I start through the data.

Thanks,

Tim

**From:** Binsted, Matthew T <matthew.binsted@pnnl.gov>
**Sent:** Tuesday, April 4, 2023 12:17 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Wolfram, Paul <paul.wolfram@pnnl.gov>
**Subject:** RE: GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Hi Tim,

Apologies again for the delay in sharing the GCAM result data. Attached please find a first cut at the data output. Note that I think the format can be improved in a number of ways, and this in part depends on how you and Matt J will be using it. We can output as an Excel workbook with multiple tabs (as we're doing currently), individual CSV files, a single CSV file with a column for variable name, etc. Any feedback re: your preferences on the format is much appreciated. A few other notes:

- The workbook currently contains data behind the figures we've been showing in our slides, which is what we've been extracting from the GCAM databases and processing (listed below). Paul and I will work together this week to include the other variables Matt requested.
    - Natural gas production by region*
    - Natural gas consumption by region*
    - Natural gas consumption by region and sector *
    - LNG exports by region*
    - Gas pipeline exports by region*
    - LNG imports by region*
    - Gas pipeline imports by region*
    - Primary energy by fuel (w/ & w/o CCS) by region
    - Electricity generation by fuel (w/ & w/o CCS) by region
- Some tabs of the workbook use aggregate regions (consistent with the figures we've shown). We can update the processing going forward to include detail for the full 32 regions included in GCAM. The data marked with * above are currently provided as aggregate regions.
- Please also note the units – we currently have a mix of Tcf, bcf/day, and EJ. I think it would be better to use consistent units (at least for the gas variables) – please let us know what you prefer.

Again, please don't hesitate to share any feedback or additional requests. Paul and I look forward to continue iterating on this with you.

Best,

Matthew

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Monday, April 3, 2023 1:23 PM
**To:** Binsted, Matthew T <matthew.binsted@pnnl.gov>
**Subject:** RE: GCAM data for LCA analysis

Thanks Matt for the update!

Tim

---

**From:** Binsted, Matthew T <matthew.binsted@pnnl.gov>
**Sent:** Monday, April 3, 2023 11:27 AM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** GCAM data for LCA analysis

DRAFT*DELIBERATIVE*PRE-DECISIONAL

Hi Tim,

Apologies – I had promised you data from GCAM by Friday so you can start thinking about how to use it in the LCA analysis. Paul modified his R processing script to spit out the data in the figures, but I wanted to quickly review his work before sending the data over. I had a fire drill on Friday that prevented me from doing so. But I will make this a priority for this afternoon, and send you the data by EOD today.

Best,

Matthew Binsted
Earth Scientist
Joint Global Change Research Institute
Pacific Northwest National Laboratory
https://www.pnnl.gov/projects/jgcri

| Scenarios | Region | Year |
|---|---|---|
| S1: Existing Capacity | Africa_Northern | 2015 |
| S2: Remove LNG Export Capacity Constraint | Africa_Southern | 2020 |
| S2a: Energy Security | Africa_Western | 2025 |
| S2b: Low Renewable Electricity Cost | Argentina | 2030 |
| S3: High Global Demand | Australia_NZ | 2035 |
| S4.1: Energy Transition (1.5C) | Brazil | 2040 |
| S4.2: Energy Transition (2C) | Canada | 2045 |
| | Central Asia | 2050 |
| | China | |
| | EU-12 | |
| | EU-15 | |
| | Europe_Non_EU | |
| | European Free Trade Association | |
| | India | |
| | Indonesia | |
| | Middle East | |
| | Russia | |
| | South Africa | |
| | South America_Northern | |
| | Southeast Asia | |
| | USA | |
| | Africa_Eastern | |
| | Africa_Northern | |
| | Africa_Southern | |
| | Africa_Western | |
| | Argentina | |
| | Australia_NZ | |
| | Brazil | |
| | Canada | |
| | Central America and Caribbean | |
| | Central Asia | |
| | China | |
| | Colombia | |
| | EU-12 | |
| | EU-15 | |
| | Europe_Eastern | |
| | Europe_Non_EU | |
| | European Free Trade Association | |
| | India | |
| | Indonesia | |
| | Japan | |
| | Mexico | |
| | Middle East | |
| | Pakistan | |
| | Russia | |
| | South Africa | |

South America_Northern
South America_Southern
South Asia
South Korea
Southeast Asia
Taiwan
USA
Africa_Northern
Africa_Southern
Africa_Western
Argentina
Australia_NZ
Brazil
Canada
Central America and Caribbean
Central Asia
China
Colombia
EU-12
EU-15
Europe_Eastern
Europe_Non_EU
European Free Trade Association
India
Indonesia
Japan
Mexico
Middle East
Pakistan
Russia
South Africa
South America_Northern
South America_Southern
South Korea
Southeast Asia
Taiwan
USA

| Sector | Input | Units |
|---|---|---|
| alumina | delivered biomass | EJ |
| alumina | delivered coal | EJ |
| alumina | refined liquids industrial | EJ |
| alumina | wholesale gas | EJ |
| aluminum | alumina | Mt |
| aluminum | elect_td_ind | EJ |

| sector | subsector | technology | input | Units |
|---|---|---|---|---|
| comm cooling | electricity | electricity | elect_td_bld | EJ |
| comm cooling | gas | gas | delivered gas | EJ |
| comm heating | biomass | biomass | delivered biomass | EJ |
| comm heating | coal | coal | delivered coal | EJ |
| comm heating | district heat | district heat | district heat | EJ |
| comm heating | electricity | electricity | elect_td_bld | EJ |
| comm heating | gas | gas | delivered gas | EJ |
| comm heating | gas | hydrogen | H2 retail delivery | EJ |
| comm heating | refined liquids | refined liquids | refined liquids enduse | EJ |
| comm others | biomass | biomass | delivered biomass | EJ |
| comm others | coal | coal | delivered coal | EJ |
| comm others | district heat | district heat | district heat | EJ |
| comm others | electricity | electricity | elect_td_bld | EJ |
| comm others | gas | gas | delivered gas | EJ |
| comm others | gas | hydrogen | H2 retail delivery | EJ |
| comm others | refined liquids | refined liquids | refined liquids enduse | EJ |
| resid cooling | electricity | electricity | elect_td_bld | EJ |
| resid cooling | gas | gas | delivered gas | EJ |
| resid heating | biomass | biomass | delivered biomass | EJ |
| resid heating | coal | coal | delivered coal | EJ |
| resid heating | district heat | district heat | district heat | EJ |
| resid heating | electricity | electricity | elect_td_bld | EJ |
| resid heating | gas | gas | delivered gas | EJ |
| resid heating | gas | hydrogen | H2 retail delivery | EJ |
| resid heating | refined liquids | refined liquids | refined liquids enduse | EJ |
| resid heating | traditional biomass | traditional biomass | traditional biomass | EJ |
| resid others | biomass | biomass | delivered biomass | EJ |
| resid others | coal | coal | delivered coal | EJ |
| resid others | district heat | district heat | district heat | EJ |
| resid others | electricity | electricity | elect_td_bld | EJ |
| resid others | gas | gas | delivered gas | EJ |
| resid others | gas | hydrogen | H2 retail delivery | EJ |
| resid others | refined liquids | refined liquids | refined liquids enduse | EJ |
| resid others | traditional biomass | traditional biomass | traditional biomass | EJ |

| sector | input | Units |
|---|---|---|
| chemical | chemical energy use | EJ |
| chemical | chemical feedstocks | EJ |

| sector | subsector | technology | vintage | Units |
|---|---|---|---|---|
| cement | cement | cement | 2015 | Mt |
| cement | cement | cement | 2020 | Mt |
| cement | cement | cement | 2025 | Mt |
| cement | cement | cement | 2030 | Mt |
| cement | cement | cement | 2035 | Mt |
| cement | cement | cement | 2040 | Mt |
| cement | cement | cement | 2045 | Mt |
| cement | cement | cement | 2050 | Mt |
| cement | cement | cement CCS | 2025 | Mt |
| cement | cement | cement CCS | 2030 | Mt |
| cement | cement | cement CCS | 2035 | Mt |
| cement | cement | cement CCS | 2040 | Mt |
| cement | cement | cement CCS | 2045 | Mt |
| cement | cement | cement CCS | 2050 | Mt |

| region | Units |
|---|---|
| Africa_Eastern | MtCO2/yr |
| Africa_Northern | MtCO2/yr |
| Africa_Southern | MtCO2/yr |
| Africa_Western | MtCO2/yr |
| Argentina | MtCO2/yr |
| Australia_NZ | MtCO2/yr |
| Brazil | MtCO2/yr |
| Canada | MtCO2/yr |
| Central America and Caribbean | MtCO2/yr |
| Central Asia | MtCO2/yr |
| China | MtCO2/yr |
| Colombia | MtCO2/yr |
| EU-12 | MtCO2/yr |
| EU-15 | MtCO2/yr |
| Europe_Eastern | MtCO2/yr |
| Europe_Non_EU | MtCO2/yr |
| European Free Trade Association | MtCO2/yr |
| India | MtCO2/yr |
| Indonesia | MtCO2/yr |
| Japan | MtCO2/yr |
| Mexico | MtCO2/yr |
| Middle East | MtCO2/yr |
| Pakistan | MtCO2/yr |
| Russia | MtCO2/yr |
| South Africa | MtCO2/yr |
| South America_Northern | MtCO2/yr |
| South America_Southern | MtCO2/yr |
| South Asia | MtCO2/yr |
| South Korea | MtCO2/yr |
| Southeast Asia | MtCO2/yr |
| Taiwan | MtCO2/yr |
| USA | MtCO2/yr |

| sector | subsector | technology | Units |
|---|---|---|---|
| agricultural energy use | mobile | refined liquids | MtCO2/yr |
| agricultural energy use | stationary | biomass | MtCO2/yr |
| agricultural energy use | stationary | coal | MtCO2/yr |
| agricultural energy use | stationary | gas | MtCO2/yr |
| agricultural energy use | stationary | refined liquids | MtCO2/yr |
| alumina | biomass | biomass | MtCO2/yr |
| alumina | biomass | biomass CCS | MtCO2/yr |
| alumina | coal | coal | MtCO2/yr |
| alumina | coal | coal CCS | MtCO2/yr |
| alumina | gas | gas | MtCO2/yr |
| alumina | gas | gas CCS | MtCO2/yr |
| alumina | refined liquids | refined liquids | MtCO2/yr |
| alumina | refined liquids | refined liquids CCS | MtCO2/yr |
| backup_electricity | gas | gas (steam/CT) | MtCO2/yr |
| cement | cement | cement | MtCO2/yr |
| cement | cement | cement CCS | MtCO2/yr |
| chemical energy use | biomass | biomass | MtCO2/yr |
| chemical energy use | biomass | biomass CCS | MtCO2/yr |
| chemical energy use | coal | coal | MtCO2/yr |
| chemical energy use | coal | coal CCS | MtCO2/yr |
| chemical energy use | gas | gas | MtCO2/yr |
| chemical energy use | gas | gas CCS | MtCO2/yr |
| chemical energy use | refined liquids | refined liquids | MtCO2/yr |
| chemical energy use | refined liquids | refined liquids CCS | MtCO2/yr |
| chemical feedstocks | coal | coal | MtCO2/yr |
| chemical feedstocks | gas | gas | MtCO2/yr |
| comm cooling | gas | gas | MtCO2/yr |
| comm heating | biomass | biomass | MtCO2/yr |
| comm heating | coal | coal | MtCO2/yr |
| comm heating | gas | gas | MtCO2/yr |
| comm heating | refined liquids | refined liquids | MtCO2/yr |
| comm others | biomass | biomass | MtCO2/yr |
| comm others | coal | coal | MtCO2/yr |
| comm others | gas | gas | MtCO2/yr |
| comm others | refined liquids | refined liquids | MtCO2/yr |
| construction energy use | mobile | refined liquids | MtCO2/yr |
| construction energy use | stationary | biomass | MtCO2/yr |
| construction energy use | stationary | coal | MtCO2/yr |
| construction energy use | stationary | gas | MtCO2/yr |
| construction energy use | stationary | refined liquids | MtCO2/yr |
| csp_backup | gas | CSP gas hybrid mode | MtCO2/yr |
| DAC | DAC | DAC | MtCO2/yr |
| desalinated water | gas | distillation | MtCO2/yr |
| desalinated water | refined liquids | distillation | MtCO2/yr |
| district heat | biomass | biomass | MtCO2/yr |
| district heat | coal | coal | MtCO2/yr |
| district heat | gas | gas | MtCO2/yr |
| district heat | refined liquids | refined liquids | MtCO2/yr |

| | | | |
|---|---|---|---|
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (dry cooling) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (once through) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (recirculating) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (seawater) | MtCO2/yr |
| elec_biomass (conv) | biomass (conv) | biomass (conv) (cooling pond) | MtCO2/yr |
| elec_biomass (conv) | biomass (conv) | biomass (conv) (dry cooling) | MtCO2/yr |
| elec_biomass (conv) | biomass (conv) | biomass (conv) (once through) | MtCO2/yr |
| elec_biomass (conv) | biomass (conv) | biomass (conv) (recirculating) | MtCO2/yr |
| elec_biomass (conv) | biomass (conv) | biomass (conv) (seawater) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (dry cooling) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (once through) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (recirculating) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (seawater) | MtCO2/yr |
| elec_biomass (IGCC) | biomass (IGCC) | biomass (IGCC) (dry cooling) | MtCO2/yr |
| elec_biomass (IGCC) | biomass (IGCC) | biomass (IGCC) (once through) | MtCO2/yr |
| elec_biomass (IGCC) | biomass (IGCC) | biomass (IGCC) (recirculating) | MtCO2/yr |
| elec_biomass (IGCC) | biomass (IGCC) | biomass (IGCC) (seawater) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (dry cooling) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (once through) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (recirculating) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (seawater) | MtCO2/yr |
| elec_coal (conv pul) | coal (conv pul) | coal (conv pul) (cooling pond) | MtCO2/yr |
| elec_coal (conv pul) | coal (conv pul) | coal (conv pul) (dry cooling) | MtCO2/yr |
| elec_coal (conv pul) | coal (conv pul) | coal (conv pul) (once through) | MtCO2/yr |
| elec_coal (conv pul) | coal (conv pul) | coal (conv pul) (recirculating) | MtCO2/yr |
| elec_coal (conv pul) | coal (conv pul) | coal (conv pul) (seawater) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (dry cooling) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (once through) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (recirculating) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (seawater) | MtCO2/yr |
| elec_coal (IGCC) | coal (IGCC) | coal (IGCC) (dry cooling) | MtCO2/yr |
| elec_coal (IGCC) | coal (IGCC) | coal (IGCC) (once through) | MtCO2/yr |
| elec_coal (IGCC) | coal (IGCC) | coal (IGCC) (recirculating) | MtCO2/yr |
| elec_coal (IGCC) | coal (IGCC) | coal (IGCC) (seawater) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (dry cooling) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (once through) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (recirculating) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (seawater) | MtCO2/yr |
| elec_gas (CC) | gas (CC) | gas (CC) (cooling pond) | MtCO2/yr |
| elec_gas (CC) | gas (CC) | gas (CC) (dry cooling) | MtCO2/yr |
| elec_gas (CC) | gas (CC) | gas (CC) (once through) | MtCO2/yr |
| elec_gas (CC) | gas (CC) | gas (CC) (recirculating) | MtCO2/yr |
| elec_gas (CC) | gas (CC) | gas (CC) (seawater) | MtCO2/yr |
| elec_gas (steam/CT) | gas (steam/CT) | gas (steam/CT) (cooling pond) | MtCO2/yr |
| elec_gas (steam/CT) | gas (steam/CT) | gas (steam/CT) (dry cooling) | MtCO2/yr |
| elec_gas (steam/CT) | gas (steam/CT) | gas (steam/CT) (once through) | MtCO2/yr |
| elec_gas (steam/CT) | gas (steam/CT) | gas (steam/CT) (recirculating) | MtCO2/yr |
| elec_gas (steam/CT) | gas (steam/CT) | gas (steam/CT) (seawater) | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (dry cooling | MtCO2/yr |

| | | | |
|---|---|---|---|
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (once throu | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (recirculatin | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (seawater) | MtCO2/yr |
| elec_refined liquids (CC) | refined liquids (CC) | refined liquids (CC) (dry cooling) | MtCO2/yr |
| elec_refined liquids (CC) | refined liquids (CC) | refined liquids (CC) (once through) | MtCO2/yr |
| elec_refined liquids (CC) | refined liquids (CC) | refined liquids (CC) (recirculating) | MtCO2/yr |
| elec_refined liquids (CC) | refined liquids (CC) | refined liquids (CC) (seawater) | MtCO2/yr |
| elec_refined liquids (steam/CT) | refined liquids (steam/CT) | refined liquids (steam/CT) (cooling p | MtCO2/yr |
| elec_refined liquids (steam/CT) | refined liquids (steam/CT) | refined liquids (steam/CT) (dry cooli | MtCO2/yr |
| elec_refined liquids (steam/CT) | refined liquids (steam/CT) | refined liquids (steam/CT) (once thr | MtCO2/yr |
| elec_refined liquids (steam/CT) | refined liquids (steam/CT) | refined liquids (steam/CT) (recircula | MtCO2/yr |
| elec_refined liquids (steam/CT) | refined liquids (steam/CT) | refined liquids (steam/CT) (seawate | MtCO2/yr |
| gas pipeline | gas pipeline | gas pipeline | MtCO2/yr |
| gas processing | biomass gasification | biomass gasification | MtCO2/yr |
| gas processing | coal gasification | coal gasification | MtCO2/yr |
| H2 central production | biomass | biomass to H2 | MtCO2/yr |
| H2 central production | biomass | biomass to H2 CCS | MtCO2/yr |
| H2 central production | coal | coal chemical CCS | MtCO2/yr |
| H2 central production | gas | natural gas steam reforming | MtCO2/yr |
| H2 central production | gas | natural gas steam reforming CCS | MtCO2/yr |
| H2 wholesale dispensing | forecourt production | natural gas steam reforming | MtCO2/yr |
| iron and steel | BLASTFUR | Biomass-based | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR CCS | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | MtCO2/yr |
| iron and steel | EAF with DRI | EAF with DRI | MtCO2/yr |
| iron and steel | EAF with DRI | EAF with DRI CCS | MtCO2/yr |
| iron and steel | EAF with scrap | EAF with scrap | MtCO2/yr |
| mining energy use | mobile | refined liquids | MtCO2/yr |
| mining energy use | stationary | biomass | MtCO2/yr |
| mining energy use | stationary | coal | MtCO2/yr |
| mining energy use | stationary | gas | MtCO2/yr |
| mining energy use | stationary | refined liquids | MtCO2/yr |
| N fertilizer | coal | coal | MtCO2/yr |
| N fertilizer | coal | coal CCS | MtCO2/yr |
| N fertilizer | gas | gas | MtCO2/yr |
| N fertilizer | gas | gas CCS | MtCO2/yr |
| N fertilizer | hydrogen | hydrogen | MtCO2/yr |
| N fertilizer | refined liquids | refined liquids | MtCO2/yr |
| other industrial energy use | biomass | biomass | MtCO2/yr |
| other industrial energy use | biomass | biomass cogen | MtCO2/yr |
| other industrial energy use | coal | coal | MtCO2/yr |
| other industrial energy use | coal | coal cogen | MtCO2/yr |
| other industrial energy use | gas | gas | MtCO2/yr |
| other industrial energy use | gas | gas cogen | MtCO2/yr |
| other industrial energy use | refined liquids | refined liquids | MtCO2/yr |
| other industrial energy use | refined liquids | refined liquids cogen | MtCO2/yr |
| other industrial feedstocks | coal | coal | MtCO2/yr |

| | | | |
|---|---|---|---|
| other industrial feedstocks | gas | gas | MtCO2/yr |
| process heat cement | biomass | biomass | MtCO2/yr |
| process heat cement | coal | coal | MtCO2/yr |
| process heat cement | gas | gas | MtCO2/yr |
| process heat cement | refined liquids | refined liquids | MtCO2/yr |
| process heat dac | gas CCS | gas CCS | MtCO2/yr |
| refining | biomass liquids | biodiesel | MtCO2/yr |
| refining | biomass liquids | BTL with hydrogen | MtCO2/yr |
| refining | biomass liquids | cellulosic ethanol | MtCO2/yr |
| refining | biomass liquids | cellulosic ethanol CCS level 1 | MtCO2/yr |
| refining | biomass liquids | cellulosic ethanol CCS level 2 | MtCO2/yr |
| refining | biomass liquids | corn ethanol | MtCO2/yr |
| refining | biomass liquids | FT biofuels | MtCO2/yr |
| refining | biomass liquids | FT biofuels CCS level 1 | MtCO2/yr |
| refining | biomass liquids | FT biofuels CCS level 2 | MtCO2/yr |
| refining | coal to liquids | coal to liquids | MtCO2/yr |
| refining | coal to liquids | coal to liquids CCS level 1 | MtCO2/yr |
| refining | coal to liquids | coal to liquids CCS level 2 | MtCO2/yr |
| refining | gas to liquids | gas to liquids | MtCO2/yr |
| refining | oil refining | oil refining | MtCO2/yr |
| regional biomass | regional biomass | regional biomass | MtCO2/yr |
| regional biomassOil | regional biomassOil | OilCrop | MtCO2/yr |
| regional biomassOil | regional biomassOil | OilPalm | MtCO2/yr |
| regional biomassOil | regional biomassOil | Soybean | MtCO2/yr |
| regional corn for ethanol | regional corn for ethanol | regional corn for ethanol | MtCO2/yr |
| regional sugar for ethanol | regional sugar for ethanol | regional sugar for ethanol | MtCO2/yr |
| resid cooling | gas | gas | MtCO2/yr |
| resid heating | biomass | biomass | MtCO2/yr |
| resid heating | coal | coal | MtCO2/yr |
| resid heating | gas | gas | MtCO2/yr |
| resid heating | refined liquids | refined liquids | MtCO2/yr |
| resid others | biomass | biomass | MtCO2/yr |
| resid others | coal | coal | MtCO2/yr |
| resid others | gas | gas | MtCO2/yr |
| resid others | refined liquids | refined liquids | MtCO2/yr |
| trn_aviation_intl | International Aviation | Liquids | MtCO2/yr |
| trn_freight | Domestic Ship | Hybrid Liquids | MtCO2/yr |
| trn_freight | Domestic Ship | Liquids | MtCO2/yr |
| trn_freight | Freight Rail | coal | MtCO2/yr |
| trn_freight | Freight Rail | Hybrid Liquids | MtCO2/yr |
| trn_freight | Freight Rail | Liquids | MtCO2/yr |
| trn_freight_road | Heavy truck | Hybrid Liquids | MtCO2/yr |
| trn_freight_road | Heavy truck | Liquids | MtCO2/yr |
| trn_freight_road | Light truck | Hybrid Liquids | MtCO2/yr |
| trn_freight_road | Light truck | Liquids | MtCO2/yr |
| trn_freight_road | Light truck | NG | MtCO2/yr |
| trn_freight_road | Medium truck | Hybrid Liquids | MtCO2/yr |
| trn_freight_road | Medium truck | Liquids | MtCO2/yr |
| trn_pass | Domestic Aviation | Liquids | MtCO2/yr |

| | | | |
|---|---|---|---|
| trn_pass | Passenger Rail | Liquids | MtCO2/yr |
| trn_pass_road | Bus | Hybrid Liquids | MtCO2/yr |
| trn_pass_road | Bus | Liquids | MtCO2/yr |
| trn_pass_road | Bus | NG | MtCO2/yr |
| trn_pass_road_LDV | 2W and 3W | Liquids | MtCO2/yr |
| trn_pass_road_LDV | 2W and 3W | NG | MtCO2/yr |
| trn_pass_road_LDV_4W | Car | Hybrid Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Car | Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Car | NG | MtCO2/yr |
| trn_pass_road_LDV_4W | Large Car and Truck | Hybrid Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Large Car and Truck | Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Large Car and Truck | NG | MtCO2/yr |
| trn_pass_road_LDV_4W | Mini Car | Hybrid Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Mini Car | Liquids | MtCO2/yr |
| trn_pass_road_LDV_4W | Mini Car | NG | MtCO2/yr |
| trn_shipping_intl | International Ship | Hybrid Liquids | MtCO2/yr |
| trn_shipping_intl | International Ship | Liquids | MtCO2/yr |

| sector | subsector | technology | Units |
|---|---|---|---|
| alumina | biomass | biomass CCS | MtCO2/yr |
| alumina | coal | coal CCS | MtCO2/yr |
| alumina | gas | gas CCS | MtCO2/yr |
| alumina | refined liquids | refined liquids CCS | MtCO2/yr |
| cement | cement | cement CCS | MtCO2/yr |
| chemical energy use | biomass | biomass CCS | MtCO2/yr |
| chemical energy use | coal | coal CCS | MtCO2/yr |
| chemical energy use | gas | gas CCS | MtCO2/yr |
| chemical energy use | refined liquids | refined liquids CCS | MtCO2/yr |
| chemical feedstocks | refined liquids | refined liquids | MtCO2/yr |
| CO2 removal | dac | hightemp DAC elec | MtCO2/yr |
| CO2 removal | dac | hightemp DAC NG | MtCO2/yr |
| CO2 removal | dac | lowtemp DAC heatpump | MtCO2/yr |
| construction feedstocks | refined liquids | refined liquids | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (dry cooling) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (once through) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (recirculating) | MtCO2/yr |
| elec_biomass (conv CCS) | biomass (conv CCS) | biomass (conv CCS) (seawater) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (dry cooling) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (once through) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (recirculating) | MtCO2/yr |
| elec_biomass (IGCC CCS) | biomass (IGCC CCS) | biomass (IGCC CCS) (seawater) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (dry cooling) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (once through) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (recirculating) | MtCO2/yr |
| elec_coal (conv pul CCS) | coal (conv pul CCS) | coal (conv pul CCS) (seawater) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (dry cooling) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (once through) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (recirculating) | MtCO2/yr |
| elec_coal (IGCC CCS) | coal (IGCC CCS) | coal (IGCC CCS) (seawater) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (dry cooling) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (once through) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (recirculating) | MtCO2/yr |
| elec_gas (CC CCS) | gas (CC CCS) | gas (CC CCS) (seawater) | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (dry cooling) | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (once through) | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (recirculating) | MtCO2/yr |
| elec_refined liquids (CC CCS) | refined liquids (CC CCS) | refined liquids (CC CCS) (seawater) | MtCO2/yr |
| H2 central production | biomass | biomass to H2 CCS | MtCO2/yr |
| H2 central production | coal | coal chemical CCS | MtCO2/yr |
| H2 central production | gas | natural gas steam reforming CCS | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR CCS | MtCO2/yr |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | MtCO2/yr |
| iron and steel | EAF with DRI | EAF with DRI CCS | MtCO2/yr |
| N fertilizer | coal | coal CCS | MtCO2/yr |
| N fertilizer | gas | gas CCS | MtCO2/yr |
| other industrial feedstocks | refined liquids | refined liquids | MtCO2/yr |
| process heat dac | gas CCS | gas CCS | MtCO2/yr |
| refining | biomass liquids | cellulosic ethanol CCS level 1 | MtCO2/yr |
| refining | biomass liquids | cellulosic ethanol CCS level 2 | MtCO2/yr |
| refining | biomass liquids | FT biofuels CCS level 1 | MtCO2/yr |
| refining | biomass liquids | FT biofuels CCS level 2 | MtCO2/yr |
| refining | coal to liquids | coal to liquids CCS level 1 | MtCO2/yr |
| refining | coal to liquids | coal to liquids CCS level 2 | MtCO2/yr |

| sector | subsector | output | Units |
|---|---|---|---|
| district heat | biomass | district heat | EJ |
| district heat | coal | district heat | EJ |
| district heat | gas | district heat | EJ |
| district heat | refined liquids | district heat | EJ |

| sector | input | Units |
|---|---|---|
| agricultural energy use | elect_td_ind | EJ |
| aluminum | elect_td_ind | EJ |
| cement | elect_td_ind | EJ |
| chemical energy use | elect_td_ind | EJ |
| CO2 removal | elect_td_ind | EJ |
| comm cooling | elect_td_bld | EJ |
| comm heating | elect_td_bld | EJ |
| comm others | elect_td_bld | EJ |
| construction energy use | elect_td_ind | EJ |
| desalinated water | elect_td_ind | EJ |
| H2 central production | elect_td_ind | EJ |
| H2 industrial | elect_td_ind | EJ |
| H2 liquid truck | elect_td_ind | EJ |
| H2 pipeline | elect_td_ind | EJ |
| H2 wholesale dispensing | elect_td_trn | EJ |
| industrial wastewater treatment | elect_td_ind | EJ |
| industrial water abstraction | elect_td_ind | EJ |
| industrial water treatment | elect_td_ind | EJ |
| iron and steel | elect_td_ind | EJ |
| irrigation water abstraction | elect_td_ind | EJ |
| mining energy use | elect_td_ind | EJ |
| municipal wastewater treatment | elect_td_bld | EJ |
| municipal water abstraction | elect_td_bld | EJ |
| municipal water distribution | elect_td_bld | EJ |
| municipal water treatment | elect_td_bld | EJ |
| other industrial energy use | elect_td_ind | EJ |
| refining | elect_td_ind | EJ |
| resid cooling | elect_td_bld | EJ |
| resid heating | elect_td_bld | EJ |
| resid others | elect_td_bld | EJ |
| trn_aviation_intl | elect_td_trn | EJ |
| trn_freight | elect_td_trn | EJ |
| trn_freight_road | elect_td_trn | EJ |
| trn_pass | elect_td_trn | EJ |
| trn_pass_road | elect_td_trn | EJ |
| trn_pass_road_LDV | elect_td_trn | EJ |
| trn_pass_road_LDV_4W | elect_td_trn | EJ |
| trn_shipping_intl | elect_td_trn | EJ |

| sector | subsector | technology | vintage | Units |
|---|---|---|---|---|
| elect_td_bld | rooftop_pv | rooftop_pv | 2020 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2025 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2030 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2035 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2040 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2045 | EJ |
| elect_td_bld | rooftop_pv | rooftop_pv | 2050 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2025 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2030 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2035 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2040 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2045 | EJ |
| electricity | biomass | biomass (conv CCS) (dry cooling) | 2050 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2025 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2030 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2035 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2040 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2045 | EJ |
| electricity | biomass | biomass (conv CCS) (once through) | 2050 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2025 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2030 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2035 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2040 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2045 | EJ |
| electricity | biomass | biomass (conv CCS) (recirculating) | 2050 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2025 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2030 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2035 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2040 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2045 | EJ |
| electricity | biomass | biomass (conv CCS) (seawater) | 2050 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2015 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2020 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2025 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2030 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2035 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2040 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2045 | EJ |
| electricity | biomass | biomass (conv) (cooling pond) | 2050 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2015 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2020 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2025 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2030 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2035 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2040 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2045 | EJ |
| electricity | biomass | biomass (conv) (dry cooling) | 2050 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2015 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2020 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2025 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2030 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2035 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2040 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2045 | EJ |
| electricity | biomass | biomass (conv) (once through) | 2050 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2015 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2020 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2025 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2030 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2035 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2040 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2045 | EJ |
| electricity | biomass | biomass (conv) (recirculating) | 2050 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2015 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2020 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2025 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2030 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2035 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2040 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2045 | EJ |
| electricity | biomass | biomass (conv) (seawater) | 2050 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2025 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2030 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2035 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2040 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2045 | EJ |
| electricity | biomass | biomass (IGCC CCS) (dry cooling) | 2050 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2025 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2030 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2035 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2040 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2045 | EJ |
| electricity | biomass | biomass (IGCC CCS) (once through) | 2050 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2025 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2030 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2035 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2040 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2045 | EJ |
| electricity | biomass | biomass (IGCC CCS) (recirculating) | 2050 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2025 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2030 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2035 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2040 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2045 | EJ |
| electricity | biomass | biomass (IGCC CCS) (seawater) | 2050 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2025 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2030 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2035 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2040 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2045 | EJ |
| electricity | biomass | biomass (IGCC) (dry cooling) | 2050 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2025 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2030 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2035 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2040 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2045 | EJ |
| electricity | biomass | biomass (IGCC) (once through) | 2050 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2025 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2030 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2035 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2040 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2045 | EJ |
| electricity | biomass | biomass (IGCC) (recirculating) | 2050 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2025 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2030 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2035 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2040 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2045 | EJ |
| electricity | biomass | biomass (IGCC) (seawater) | 2050 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2025 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2030 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2035 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2040 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2045 | EJ |
| electricity | coal | coal (conv pul CCS) (dry cooling) | 2050 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2025 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2030 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2035 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2040 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2045 | EJ |
| electricity | coal | coal (conv pul CCS) (once through) | 2050 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2025 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2030 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2035 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2040 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2045 | EJ |
| electricity | coal | coal (conv pul CCS) (recirculating) | 2050 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2025 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2030 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2035 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2040 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2045 | EJ |
| electricity | coal | coal (conv pul CCS) (seawater) | 2050 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2015 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2020 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2025 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2030 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2035 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2040 | EJ |
| electricity | coal | coal (conv pul) (cooling pond) | 2045 | EJ |

Same data set with Vintage set to Columns. Data is Vintage Count, the purpose is only to indicate what Vintage/Technology emission factors are needed for.

| sector | subsector |
|---|---|
| elect_td_bld | rooftop_pv |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | biomass |
| electricity | coal |
| electricity | coal |
| electricity | coal |
| electricity | coal |
| electricity | coal |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | gas |
| electricity | geothermal |
| electricity | geothermal |
| electricity | hydro |
| electricity | nuclear |
| electricity | nuclear |
| electricity | nuclear |
| electricity | nuclear |
| electricity | nuclear |
| electricity | nuclear |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | refined liquids |
| electricity | solar |
| electricity | solar |
| electricity | solar |
| electricity | solar |
| electricity | solar |
| electricity | wind |
| electricity | wind |
| electricity | wind |

| technology | Units | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|
| rooftop_pv | EJ | | 224 | 224 | 224 | 224 | 224 | 224 | 224 |
| biomass (conv CCS) (dry cooling) | EJ | | | 378 | 325 | 260 | 195 | 130 | 65 |
| biomass (conv CCS) (once through) | EJ | | | 373 | 325 | 260 | 195 | 130 | 65 |
| biomass (conv CCS) (recirculating) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| biomass (conv CCS) (seawater) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| biomass (conv) (cooling pond) | EJ | 168 | 98 | 84 | 70 | 56 | 42 | 28 | 14 |
| biomass (conv) (dry cooling) | EJ | 1394 | 1274 | 1080 | 910 | 728 | 567 | 378 | 189 |
| biomass (conv) (once through) | EJ | 1662 | 1372 | 1164 | 980 | 784 | 609 | 406 | 203 |
| biomass (conv) (recirculating) | EJ | 1631 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| biomass (conv) (seawater) | EJ | 1619 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| biomass (IGCC CCS) (dry cooling) | EJ | | | 318 | 265 | 228 | 171 | 114 | 56 |
| biomass (IGCC CCS) (once through) | EJ | | | 300 | 269 | 208 | 165 | 114 | 57 |
| biomass (IGCC CCS) (recirculating) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| biomass (IGCC CCS) (seawater) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| biomass (IGCC) (dry cooling) | EJ | | | 1080 | 910 | 728 | 567 | 378 | 189 |
| biomass (IGCC) (once through) | EJ | | | 1164 | 980 | 784 | 609 | 406 | 203 |
| biomass (IGCC) (recirculating) | EJ | | | 1290 | 1085 | 868 | 672 | 448 | 224 |
| biomass (IGCC) (seawater) | EJ | | | 1290 | 1085 | 868 | 672 | 448 | 224 |
| coal (conv pul CCS) (dry cooling) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (conv pul CCS) (once through) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (conv pul CCS) (recirculating) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (conv pul CCS) (seawater) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (conv pul) (cooling pond) | EJ | 224 | 49 | 42 | 35 | 28 | 21 | 14 | 7 |
| coal (conv pul) (dry cooling) | EJ | 1511 | 1176 | 996 | 840 | 672 | 525 | 349 | 175 |
| coal (conv pul) (once through) | EJ | 1795 | 1323 | 1122 | 945 | 756 | 588 | 391 | 196 |
| coal (conv pul) (recirculating) | EJ | 1795 | 1421 | 1206 | 1015 | 812 | 630 | 420 | 210 |
| coal (conv pul) (seawater) | EJ | 1736 | 1421 | 1206 | 1015 | 812 | 630 | 419 | 210 |
| coal (IGCC CCS) (dry cooling) | EJ | | | 276 | 240 | 192 | 150 | 100 | 50 |
| coal (IGCC CCS) (once through) | EJ | | | 312 | 270 | 216 | 168 | 112 | 56 |
| coal (IGCC CCS) (recirculating) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (IGCC CCS) (seawater) | EJ | | | 336 | 290 | 232 | 180 | 120 | 60 |
| coal (IGCC) (dry cooling) | EJ | | | 996 | 840 | 672 | 525 | 349 | 175 |
| coal (IGCC) (once through) | EJ | | | 1122 | 945 | 756 | 588 | 391 | 196 |
| coal (IGCC) (recirculating) | EJ | | | 1206 | 1015 | 812 | 630 | 420 | 210 |
| coal (IGCC) (seawater) | EJ | | | 1206 | 1015 | 812 | 630 | 419 | 210 |
| gas (CC CCS) (dry cooling) | EJ | | | 330 | 285 | 228 | 177 | 118 | 59 |
| gas (CC CCS) (once through) | EJ | | | 324 | 280 | 224 | 174 | 116 | 58 |
| gas (CC CCS) (recirculating) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| gas (CC CCS) (seawater) | EJ | | | 390 | 335 | 268 | 207 | 138 | 69 |
| gas (CC) (cooling pond) | EJ | 168 | 49 | 42 | 35 | 28 | 21 | 14 | 7 |
| gas (CC) (dry cooling) | EJ | 1176 | 1274 | 1080 | 910 | 728 | 567 | 378 | 189 |
| gas (CC) (once through) | EJ | 1288 | 1372 | 1164 | 980 | 784 | 609 | 406 | 203 |
| gas (CC) (recirculating) | EJ | 1288 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| gas (CC) (seawater) | EJ | 1288 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| gas (steam/CT) (cooling pond) | EJ | 168 | 98 | 84 | 70 | 56 | 42 | 28 | 14 |
| gas (steam/CT) (dry cooling) | EJ | 1456 | 1274 | 1080 | 910 | 728 | 567 | 378 | 189 |
| gas (steam/CT) (once through) | EJ | 1736 | 1372 | 1164 | 980 | 784 | 609 | 406 | 203 |
| gas (steam/CT) (recirculating) | EJ | 1680 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| gas (steam/CT) (seawater) | EJ | 1736 | 1519 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| geothermal (dry_hybrid) | EJ | 546 | 1260 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| geothermal (recirculating) | EJ | 546 | 1260 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| hydro | EJ | 224 | 224 | 224 | 224 | 224 | 224 | 224 | 224 |
| Gen_II_LWR (cooling pond) | EJ | 112 | ? | ? | ? | ? | ? | ? | ? |
| Gen_II_LWR (once through) | EJ | 840 | | | | | | | |
| Gen_II_LWR (recirculating) | EJ | 952 | ? | ? | ? | ? | ? | ? | ? |
| Gen_II_LWR (seawater) | EJ | 1064 | ? | ? | ? | ? | ? | ? | ? |
| Gen_III (cooling pond) | EJ | | 49 | 42 | 35 | 28 | 21 | 14 | 7 |
| Gen_III (once through) | EJ | | 833 | 744 | 630 | 504 | 441 | 294 | 147 |
| Gen_III (recirculating) | EJ | | 1078 | 964 | 805 | 644 | 546 | 364 | 182 |
| Gen_III (seawater) | EJ | | 1176 | 1080 | 910 | 700 | 588 | 392 | 196 |
| refined liquids (CC CCS) (dry cooling) | EJ | | | 288 | 250 | 200 | 156 | 104 | 52 |
| refined liquids (CC CCS) (once through) | EJ | | | 324 | 280 | 224 | 174 | 116 | 58 |
| refined liquids (CC CCS) (recirculating) | EJ | | | 348 | 300 | 240 | 186 | 124 | 62 |
| refined liquids (CC CCS) (seawater) | EJ | | | 348 | 300 | 240 | 188 | 124 | 62 |
| refined liquids (CC) (dry cooling) | EJ | | 1225 | 1036 | 875 | 700 | 546 | 364 | 182 |
| refined liquids (CC) (once through) | EJ | | 1372 | 1164 | 980 | 784 | 609 | 406 | 203 |
| refined liquids (CC) (recirculating) | EJ | | 1470 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| refined liquids (CC) (seawater) | EJ | | 1470 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| refined liquids (steam/CT) (cooling pond) | EJ | 224 | 49 | 42 | 35 | 28 | 21 | 14 | 7 |
| refined liquids (steam/CT) (dry cooling) | EJ | 1568 | 1225 | 1038 | 875 | 700 | 546 | 364 | 182 |
| refined liquids (steam/CT) (once through) | EJ | 1792 | 1372 | 1164 | 980 | 784 | 609 | 406 | 203 |
| refined liquids (steam/CT) (recirculating) | EJ | 1736 | 1470 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| refined liquids (steam/CT) (seawater) | EJ | 1792 | 1470 | 1248 | 1050 | 840 | 651 | 434 | 217 |
| CSP (dry_hybrid) | EJ | 294 | | | | | | | |
| CSP (recirculating) | EJ | 294 | | | | | | | |
| CSP_storage (dry_hybrid) | EJ | | 1218 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| CSP_storage (recirculating) | EJ | | 1302 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| PV | EJ | 1302 | 1302 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| PV_storage | EJ | | 1302 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| wind | EJ | 1344 | 1302 | 1290 | 1085 | 868 | 672 | 448 | 224 |
| wind_offshore | EJ | | 1050 | 1075 | 1085 | 868 | 672 | 448 | 224 |
| wind_storage | EJ | | 1302 | 1290 | 1085 | 868 | 672 | 448 | 224 |

| | | | | |
|---|---|---|---|---|
| electricity | coal | coal (conv pul) (cooling pond) | 2050 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2015 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2020 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2025 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2030 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2035 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2040 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2045 | EJ |
| electricity | coal | coal (conv pul) (dry cooling) | 2050 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2015 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2020 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2025 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2030 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2035 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2040 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2045 | EJ |
| electricity | coal | coal (conv pul) (once through) | 2050 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2015 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2020 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2025 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2030 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2035 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2040 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2045 | EJ |
| electricity | coal | coal (conv pul) (recirculating) | 2050 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2015 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2020 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2025 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2030 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2035 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2040 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2045 | EJ |
| electricity | coal | coal (conv pul) (seawater) | 2050 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2025 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2030 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2035 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2040 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2045 | EJ |
| electricity | coal | coal (IGCC CCS) (dry cooling) | 2050 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2025 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2030 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2035 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2040 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2045 | EJ |
| electricity | coal | coal (IGCC CCS) (once through) | 2050 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2025 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2030 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2035 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2040 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2045 | EJ |
| electricity | coal | coal (IGCC CCS) (recirculating) | 2050 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2025 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2030 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2035 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2040 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2045 | EJ |
| electricity | coal | coal (IGCC CCS) (seawater) | 2050 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2025 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2030 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2035 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2040 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2045 | EJ |
| electricity | coal | coal (IGCC) (dry cooling) | 2050 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2025 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2030 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2035 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2040 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2045 | EJ |
| electricity | coal | coal (IGCC) (once through) | 2050 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2025 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2030 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2035 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2040 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2045 | EJ |
| electricity | coal | coal (IGCC) (recirculating) | 2050 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2025 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2030 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2035 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2040 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2045 | EJ |
| electricity | coal | coal (IGCC) (seawater) | 2050 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2025 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2030 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2035 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2040 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2045 | EJ |
| electricity | gas | gas (CC CCS) (dry cooling) | 2050 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2025 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2030 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2035 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2040 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2045 | EJ |
| electricity | gas | gas (CC CCS) (once through) | 2050 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2025 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2030 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2035 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2040 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2045 | EJ |
| electricity | gas | gas (CC CCS) (recirculating) | 2050 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2025 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2030 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2035 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2040 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2045 | EJ |
| electricity | gas | gas (CC CCS) (seawater) | 2050 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2015 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2020 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2025 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2030 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2035 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2040 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2045 | EJ |
| electricity | gas | gas (CC) (cooling pond) | 2050 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2015 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2020 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2025 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2030 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2035 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2040 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2045 | EJ |
| electricity | gas | gas (CC) (dry cooling) | 2050 | EJ |
| electricity | gas | gas (CC) (once through) | 2015 | EJ |
| electricity | gas | gas (CC) (once through) | 2020 | EJ |
| electricity | gas | gas (CC) (once through) | 2025 | EJ |
| electricity | gas | gas (CC) (once through) | 2030 | EJ |
| electricity | gas | gas (CC) (once through) | 2035 | EJ |
| electricity | gas | gas (CC) (once through) | 2040 | EJ |
| electricity | gas | gas (CC) (once through) | 2045 | EJ |
| electricity | gas | gas (CC) (once through) | 2050 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2015 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2020 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2025 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2030 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2035 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2040 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2045 | EJ |
| electricity | gas | gas (CC) (recirculating) | 2050 | EJ |
| electricity | gas | gas (CC) (seawater) | 2015 | EJ |
| electricity | gas | gas (CC) (seawater) | 2020 | EJ |
| electricity | gas | gas (CC) (seawater) | 2025 | EJ |
| electricity | gas | gas (CC) (seawater) | 2030 | EJ |
| electricity | gas | gas (CC) (seawater) | 2035 | EJ |
| electricity | gas | gas (CC) (seawater) | 2040 | EJ |
| electricity | gas | gas (CC) (seawater) | 2045 | EJ |
| electricity | gas | gas (CC) (seawater) | 2050 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2015 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2020 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2025 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2030 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2035 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2040 | EJ |

| | | | | |
|---|---|---|---|---|
| electricity | gas | gas (steam/CT) (cooling pond) | 2045 | EJ |
| electricity | gas | gas (steam/CT) (cooling pond) | 2050 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2015 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2020 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2025 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2030 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2035 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2040 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2045 | EJ |
| electricity | gas | gas (steam/CT) (dry cooling) | 2050 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2015 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2020 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2025 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2030 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2035 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2040 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2045 | EJ |
| electricity | gas | gas (steam/CT) (once through) | 2050 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2015 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2020 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2025 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2030 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2035 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2040 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2045 | EJ |
| electricity | gas | gas (steam/CT) (recirculating) | 2050 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2015 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2020 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2025 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2030 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2035 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2040 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2045 | EJ |
| electricity | gas | gas (steam/CT) (seawater) | 2050 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2015 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2020 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2025 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2030 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2035 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2040 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2045 | EJ |
| electricity | geothermal | geothermal (dry_hybrid) | 2050 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2015 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2020 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2025 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2030 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2035 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2040 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2045 | EJ |
| electricity | geothermal | geothermal (recirculating) | 2050 | EJ |
| electricity | hydro | hydro | 2015 | EJ |
| electricity | hydro | hydro | 2020 | EJ |
| electricity | hydro | hydro | 2025 | EJ |
| electricity | hydro | hydro | 2030 | EJ |
| electricity | hydro | hydro | 2035 | EJ |
| electricity | hydro | hydro | 2040 | EJ |
| electricity | hydro | hydro | 2045 | EJ |
| electricity | hydro | hydro | 2050 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2015 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2020 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2025 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2030 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2035 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2040 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2045 | EJ |
| electricity | nuclear | Gen_II_LWR (cooling pond) | 2050 | EJ |
| electricity | nuclear | Gen_II_LWR (once through) | 2015 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2015 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2020 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2025 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2030 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2035 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2040 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2045 | EJ |
| electricity | nuclear | Gen_II_LWR (recirculating) | 2050 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2015 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2020 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2025 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2030 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2035 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2040 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2045 | EJ |
| electricity | nuclear | Gen_II_LWR (seawater) | 2050 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2020 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2025 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2030 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2035 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2040 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2045 | EJ |
| electricity | nuclear | Gen_III (cooling pond) | 2050 | EJ |
| electricity | nuclear | Gen_III (once through) | 2020 | EJ |
| electricity | nuclear | Gen_III (once through) | 2025 | EJ |
| electricity | nuclear | Gen_III (once through) | 2030 | EJ |
| electricity | nuclear | Gen_III (once through) | 2035 | EJ |
| electricity | nuclear | Gen_III (once through) | 2040 | EJ |
| electricity | nuclear | Gen_III (once through) | 2045 | EJ |
| electricity | nuclear | Gen_III (once through) | 2050 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2020 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2025 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2030 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2035 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2040 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2045 | EJ |
| electricity | nuclear | Gen_III (recirculating) | 2050 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2020 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2025 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2030 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2035 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2040 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2045 | EJ |
| electricity | nuclear | Gen_III (seawater) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (dry cooling) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (once through) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (recirculating) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC CCS) (seawater) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2020 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC) (dry cooling) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2020 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC) (once through) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2020 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2025 | EJ |

| | | | | |
|---|---|---|---|---|
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC) (recirculating) | 2050 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2020 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2025 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2030 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2035 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2040 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2045 | EJ |
| electricity | refined liquids | refined liquids (CC) (seawater) | 2050 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2015 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2020 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2025 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2030 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2035 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2040 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2045 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (cooling pond) | 2050 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2015 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2020 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2025 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2030 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2035 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2040 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2045 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (dry cooling) | 2050 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2015 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2020 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2025 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2030 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2035 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2040 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2045 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (once through) | 2050 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2015 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2020 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2025 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2030 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2035 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2040 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2045 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (recirculating) | 2050 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2015 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2020 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2025 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2030 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2035 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2040 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2045 | EJ |
| electricity | refined liquids | refined liquids (steam/CT) (seawater) | 2050 | EJ |
| electricity | solar | CSP (dry_hybrid) | 2015 | EJ |
| electricity | solar | CSP (recirculating) | 2015 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2020 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2025 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2030 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2035 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2040 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2045 | EJ |
| electricity | solar | CSP_storage (dry_hybrid) | 2050 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2020 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2025 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2030 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2035 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2040 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2045 | EJ |
| electricity | solar | CSP_storage (recirculating) | 2050 | EJ |
| electricity | solar | PV | 2015 | EJ |
| electricity | solar | PV | 2020 | EJ |
| electricity | solar | PV | 2025 | EJ |
| electricity | solar | PV | 2030 | EJ |
| electricity | solar | PV | 2035 | EJ |
| electricity | solar | PV | 2040 | EJ |
| electricity | solar | PV | 2045 | EJ |
| electricity | solar | PV | 2050 | EJ |
| electricity | solar | PV_storage | 2020 | EJ |
| electricity | solar | PV_storage | 2025 | EJ |
| electricity | solar | PV_storage | 2030 | EJ |
| electricity | solar | PV_storage | 2035 | EJ |
| electricity | solar | PV_storage | 2040 | EJ |
| electricity | solar | PV_storage | 2045 | EJ |
| electricity | solar | PV_storage | 2050 | EJ |
| electricity | wind | wind | 2015 | EJ |
| electricity | wind | wind | 2020 | EJ |
| electricity | wind | wind | 2025 | EJ |
| electricity | wind | wind | 2030 | EJ |
| electricity | wind | wind | 2035 | EJ |
| electricity | wind | wind | 2040 | EJ |
| electricity | wind | wind | 2045 | EJ |
| electricity | wind | wind | 2050 | EJ |
| electricity | wind | wind_offshore | 2020 | EJ |
| electricity | wind | wind_offshore | 2025 | EJ |
| electricity | wind | wind_offshore | 2030 | EJ |
| electricity | wind | wind_offshore | 2035 | EJ |
| electricity | wind | wind_offshore | 2040 | EJ |
| electricity | wind | wind_offshore | 2045 | EJ |
| electricity | wind | wind_offshore | 2050 | EJ |
| electricity | wind | wind_storage | 2020 | EJ |
| electricity | wind | wind_storage | 2025 | EJ |
| electricity | wind | wind_storage | 2030 | EJ |
| electricity | wind | wind_storage | 2035 | EJ |
| electricity | wind | wind_storage | 2040 | EJ |
| electricity | wind | wind_storage | 2045 | EJ |
| electricity | wind | wind_storage | 2050 | EJ |

| sector | subsector | Units |
|---|---|---|
| electricity | biomass | 2021$/GJ |
| electricity | coal | 2021$/GJ |
| electricity | gas | 2021$/GJ |
| electricity | geothermal | 2021$/GJ |
| electricity | nuclear | 2021$/GJ |
| electricity | refined liquids | 2021$/GJ |
| electricity | solar | 2021$/GJ |
| electricity | wind | 2021$/GJ |

| sector | input | Units |
|---|---|---|
| N fertilizer | delivered coal | EJ |
| N fertilizer | H2 industrial | EJ |
| N fertilizer | refined liquids industrial | EJ |
| N fertilizer | wholesale gas | EJ |

| sector | input | Units |
|---|---|---|
| agricultural energy use | biomass | EJ |
| agricultural energy use | coal | EJ |
| agricultural energy use | district heat | EJ |
| agricultural energy use | electricity | EJ |
| agricultural energy use | gas | EJ |
| agricultural energy use | hydrogen | EJ |
| agricultural energy use | refined liquids | EJ |
| alumina | biomass | EJ |
| alumina | coal | EJ |
| alumina | gas | EJ |
| alumina | refined liquids | EJ |
| aluminum | electricity | EJ |
| cement | electricity | EJ |
| chemical energy use | biomass | EJ |
| chemical energy use | coal | EJ |
| chemical energy use | district heat | EJ |
| chemical energy use | electricity | EJ |
| chemical energy use | gas | EJ |
| chemical energy use | refined liquids | EJ |
| chemical feedstocks | coal | EJ |
| chemical feedstocks | gas | EJ |
| chemical feedstocks | refined liquids | EJ |
| CO2 removal | electricity | EJ |
| CO2 removal | process heat dac | EJ |
| comm cooling | electricity | EJ |
| comm cooling | gas | EJ |
| comm heating | biomass | EJ |
| comm heating | coal | EJ |
| comm heating | district heat | EJ |
| comm heating | electricity | EJ |
| comm heating | gas | EJ |
| comm heating | hydrogen | EJ |
| comm heating | refined liquids | EJ |
| comm others | biomass | EJ |
| comm others | coal | EJ |
| comm others | district heat | EJ |
| comm others | electricity | EJ |
| comm others | gas | EJ |
| comm others | hydrogen | EJ |
| comm others | refined liquids | EJ |
| construction energy use | biomass | EJ |
| construction energy use | coal | EJ |
| construction energy use | district heat | EJ |
| construction energy use | electricity | EJ |
| construction energy use | gas | EJ |
| construction energy use | hydrogen | EJ |

| | | |
|---|---|---|
| construction energy use | refined liquids | EJ |
| construction feedstocks | refined liquids | EJ |
| desalinated water | electricity | EJ |
| desalinated water | gas | EJ |
| desalinated water | refined liquids | EJ |
| industrial wastewater treatment | electricity | EJ |
| industrial water abstraction | electricity | EJ |
| industrial water treatment | electricity | EJ |
| iron and steel | biomass | EJ |
| iron and steel | coal | EJ |
| iron and steel | electricity | EJ |
| iron and steel | gas | EJ |
| iron and steel | hydrogen | EJ |
| iron and steel | refined liquids | EJ |
| irrigation water abstraction | electricity | EJ |
| mining energy use | biomass | EJ |
| mining energy use | coal | EJ |
| mining energy use | district heat | EJ |
| mining energy use | electricity | EJ |
| mining energy use | gas | EJ |
| mining energy use | hydrogen | EJ |
| mining energy use | refined liquids | EJ |
| municipal wastewater treatment | electricity | EJ |
| municipal water abstraction | electricity | EJ |
| municipal water distribution | electricity | EJ |
| municipal water treatment | electricity | EJ |
| N fertilizer | coal | EJ |
| N fertilizer | gas | EJ |
| N fertilizer | hydrogen | EJ |
| N fertilizer | refined liquids | EJ |
| other industrial energy use | biomass | EJ |
| other industrial energy use | coal | EJ |
| other industrial energy use | district heat | EJ |
| other industrial energy use | electricity | EJ |
| other industrial energy use | gas | EJ |
| other industrial energy use | hydrogen | EJ |
| other industrial energy use | refined liquids | EJ |
| other industrial feedstocks | coal | EJ |
| other industrial feedstocks | gas | EJ |
| other industrial feedstocks | refined liquids | EJ |
| process heat cement | biomass | EJ |
| process heat cement | coal | EJ |
| process heat cement | gas | EJ |
| process heat cement | hydrogen | EJ |
| process heat cement | refined liquids | EJ |
| process heat dac | gas | EJ |
| resid cooling | electricity | EJ |

| | | |
|---|---|---|
| resid cooling | gas | EJ |
| resid heating | biomass | EJ |
| resid heating | coal | EJ |
| resid heating | district heat | EJ |
| resid heating | electricity | EJ |
| resid heating | gas | EJ |
| resid heating | hydrogen | EJ |
| resid heating | refined liquids | EJ |
| resid heating | traditional biomass | EJ |
| resid others | biomass | EJ |
| resid others | coal | EJ |
| resid others | district heat | EJ |
| resid others | electricity | EJ |
| resid others | gas | EJ |
| resid others | hydrogen | EJ |
| resid others | refined liquids | EJ |
| resid others | traditional biomass | EJ |
| trn_aviation_intl | electricity | EJ |
| trn_aviation_intl | hydrogen | EJ |
| trn_aviation_intl | refined liquids | EJ |
| trn_freight | coal | EJ |
| trn_freight | electricity | EJ |
| trn_freight | hydrogen | EJ |
| trn_freight | refined liquids | EJ |
| trn_freight_road | electricity | EJ |
| trn_freight_road | gas | EJ |
| trn_freight_road | hydrogen | EJ |
| trn_freight_road | refined liquids | EJ |
| trn_pass | electricity | EJ |
| trn_pass | hydrogen | EJ |
| trn_pass | refined liquids | EJ |
| trn_pass_road | electricity | EJ |
| trn_pass_road | gas | EJ |
| trn_pass_road | hydrogen | EJ |
| trn_pass_road | refined liquids | EJ |
| trn_pass_road_LDV | electricity | EJ |
| trn_pass_road_LDV | gas | EJ |
| trn_pass_road_LDV | refined liquids | EJ |
| trn_pass_road_LDV_4W | electricity | EJ |
| trn_pass_road_LDV_4W | gas | EJ |
| trn_pass_road_LDV_4W | hydrogen | EJ |
| trn_pass_road_LDV_4W | refined liquids | EJ |
| trn_shipping_intl | electricity | EJ |
| trn_shipping_intl | hydrogen | EJ |
| trn_shipping_intl | refined liquids | EJ |

| fuel | Units |
|---|---|
| delivered biomass | 2021$/GJ |
| delivered coal | 2021$/GJ |
| delivered gas | 2021$/GJ |
| elect_td_bld | 2021$/GJ |
| elect_td_ind | 2021$/GJ |
| elect_td_trn | 2021$/GJ |
| H2 retail delivery | 2021$/GJ |
| H2 retail dispensing | 2021$/GJ |
| H2 wholesale delivery | 2021$/GJ |
| H2 wholesale dispensing | 2021$/GJ |
| refined liquids enduse | 2021$/GJ |
| refined liquids industrial | 2021$/GJ |
| wholesale gas | 2021$/GJ |

| sector | input | Units |
|---|---|---|
| agricultural energy use | wholesale gas | EJ |
| alumina | wholesale gas | EJ |
| backup_electricity | wholesale gas | EJ |
| chemical energy use | wholesale gas | EJ |
| chemical feedstocks | wholesale gas | EJ |
| comm cooling | delivered gas | EJ |
| comm heating | delivered gas | EJ |
| comm others | delivered gas | EJ |
| construction energy use | wholesale gas | EJ |
| csp_backup | wholesale gas | EJ |
| desalinated water | wholesale gas | EJ |
| district heat | wholesale gas | EJ |
| elec_gas (CC CCS) | wholesale gas | EJ |
| elec_gas (CC) | wholesale gas | EJ |
| elec_gas (steam/CT) | wholesale gas | EJ |
| H2 wholesale dispensing | delivered gas | EJ |
| iron and steel | wholesale gas | EJ |
| mining energy use | wholesale gas | EJ |
| N fertilizer | wholesale gas | EJ |
| other industrial energy use | wholesale gas | EJ |
| other industrial feedstocks | wholesale gas | EJ |
| process heat cement | wholesale gas | EJ |
| process heat dac | wholesale gas | EJ |
| refining | wholesale gas | EJ |
| resid cooling | delivered gas | EJ |
| resid heating | delivered gas | EJ |
| resid others | delivered gas | EJ |
| trn_freight_road | delivered gas | EJ |
| trn_pass_road | delivered gas | EJ |
| trn_pass_road_LDV | delivered gas | EJ |
| trn_pass_road_LDV_4W | delivered gas | EJ |

| sector | subsector | technology | Units |
|---|---|---|---|
| gas processing | biomass gasification | biomass gasification | 2021$/GJ |
| gas processing | coal gasification | coal gasification | 2021$/GJ |
| gas processing | natural gas | natural gas | 2021$/GJ |

| sector | subsector | technology | fuel | Units |
|---|---|---|---|---|
| gas processing | biomass gasification | biomass gasification | regional biomass | EJ |
| gas processing | coal gasification | coal gasification | regional coal | EJ |
| gas processing | natural gas | natural gas | regional natural gas | EJ |

| region | pipeline_input | pipeline_output | Units |
|---|---|---|---|
| Africa_Eastern | Scenario, Year Value | Scenario, Year Value | EJ |
| Africa_Northern | Scenario, Year Value | Scenario, Year Value | EJ |
| Africa_Southern | Scenario, Year Value | Scenario, Year Value | EJ |
| Africa_Western | Scenario, Year Value | Scenario, Year Value | EJ |
| Argentina | Scenario, Year Value | Scenario, Year Value | EJ |
| Australia_NZ | Scenario, Year Value | Scenario, Year Value | EJ |
| Brazil | Scenario, Year Value | Scenario, Year Value | EJ |
| Canada | Scenario, Year Value | Scenario, Year Value | EJ |
| Central America and Carib | Scenario, Year Value | Scenario, Year Value | EJ |
| Central Asia | Scenario, Year Value | Scenario, Year Value | EJ |
| China | Scenario, Year Value | Scenario, Year Value | EJ |
| Colombia | Scenario, Year Value | Scenario, Year Value | EJ |
| EU-12 | Scenario, Year Value | Scenario, Year Value | EJ |
| EU-15 | Scenario, Year Value | Scenario, Year Value | EJ |
| Europe_Eastern | Scenario, Year Value | Scenario, Year Value | EJ |
| Europe_Non_EU | Scenario, Year Value | Scenario, Year Value | EJ |
| European Free Trade Asso | Scenario, Year Value | Scenario, Year Value | EJ |
| India | Scenario, Year Value | Scenario, Year Value | EJ |
| Indonesia | Scenario, Year Value | Scenario, Year Value | EJ |
| Japan | Scenario, Year Value | Scenario, Year Value | EJ |
| Mexico | Scenario, Year Value | Scenario, Year Value | EJ |
| Middle East | Scenario, Year Value | Scenario, Year Value | EJ |
| Pakistan | Scenario, Year Value | Scenario, Year Value | EJ |
| Russia | Scenario, Year Value | Scenario, Year Value | EJ |
| South Africa | Scenario, Year Value | Scenario, Year Value | EJ |
| South America_Northern | Scenario, Year Value | Scenario, Year Value | EJ |
| South America_Southern | Scenario, Year Value | Scenario, Year Value | EJ |
| South Asia | Scenario, Year Value | Scenario, Year Value | EJ |
| South Korea | Scenario, Year Value | Scenario, Year Value | EJ |
| Southeast Asia | Scenario, Year Value | Scenario, Year Value | EJ |
| Taiwan | Scenario, Year Value | Scenario, Year Value | EJ |
| USA | Scenario, Year Value | Scenario, Year Value | EJ |

| sector | subsector | technology | Units |
|---|---|---|---|
| gas processing | biomass gasification | biomass gasification | EJ |
| gas processing | coal gasification | coal gasification | EJ |
| gas processing | natural gas | natural gas | EJ |

| sector | subsector | technology | Units | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|
| H2 central production | biomass | biomass to H2 | EJ | x | x | x | x | x | x |
| H2 central production | biomass | biomass to H2 CCS | EJ | x | x | x | x | x | x |
| H2 central production | coal | coal chemical CCS | EJ | x | x | x | x | x | x |
| H2 central production | electricity | electrolysis | EJ | x | x | x | x | x | x |
| H2 central production | gas | natural gas steam reforming | EJ | x | x | x | x | x | x |
| H2 central production | gas | natural gas steam reforming CCS | EJ | x | x | x | x | x | x |
| H2 central production | nuclear | thermal splitting | EJ | x | x | x | x | x | x |
| H2 central production | solar | electrolysis | EJ | x | x | x | x | x | x |
| H2 central production | wind | electrolysis | EJ | x | x | x | x | x | x |
| H2 industrial | forecourt production | electrolysis | EJ | x | x | x | x | x | x |
| H2 wholesale dispensing | forecourt production | electrolysis | EJ | x | x | x | x | x | x |
| H2 wholesale dispensing | forecourt production | natural gas steam reforming | EJ | x | x | x | x | x | x |

| sector | subsector | technology | input | Units | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| agricultural energy use | mobile | electricity | elect_td_ind | EJ | | | X | X | X | X | X | X |
| agricultural energy use | mobile | hydrogen | H2 wholesale dispensing | EJ | | | X | X | X | X | X | X |
| agricultural energy use | mobile | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| agricultural energy use | stationary | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| agricultural energy use | stationary | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| agricultural energy use | stationary | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| agricultural energy use | stationary | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| agricultural energy use | stationary | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| alumina | biomass | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| alumina | biomass | biomass CCS | delivered biomass | EJ | | X | X | X | X | X | X | X |
| alumina | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| alumina | coal | coal CCS | delivered coal | EJ | | | X | X | X | X | X | X |
| alumina | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| alumina | gas | gas CCS | wholesale gas | EJ | | X | X | X | X | X | X | X |
| alumina | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| alumina | refined liquids | refined liquids CCS | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| aluminum | electricity | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| cement | cement | cement | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| cement | cement | cement CCS | elect_td_ind | EJ | | | X | X | X | X | X | X |
| chemical energy use | biomass | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| chemical energy use | biomass | biomass CCS | delivered biomass | EJ | | X | X | X | X | X | X | X |
| chemical energy use | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| chemical energy use | coal | coal CCS | delivered coal | EJ | | X | X | X | X | X | X | X |
| chemical energy use | electricity | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| chemical energy use | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| chemical energy use | gas | gas CCS | wholesale gas | EJ | | X | X | X | X | X | X | X |
| chemical energy use | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| chemical energy use | refined liquids | refined liquids CCS | refined liquids industrial | EJ | | X | X | X | X | X | X | X |
| chemical feedstocks | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| chemical feedstocks | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| chemical feedstocks | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| CO2 removal | dac | hightemp DAC elec | elect_td_ind | EJ | | | X | X | X | X | X | X |
| CO2 removal | dac | hightemp DAC NG | elect_td_ind | EJ | | | X | X | X | X | X | X |
| CO2 removal | dac | lowtemp DAC heatpump | elect_td_ind | EJ | | | X | X | X | X | X | X |
| construction energy use | mobile | electricity | elect_td_ind | EJ | | | X | X | X | X | X | X |
| construction energy use | mobile | hydrogen | H2 wholesale dispensing | EJ | | | X | X | X | X | X | X |
| construction energy use | mobile | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| construction energy use | stationary | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| construction energy use | stationary | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| construction energy use | stationary | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| construction energy use | stationary | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| construction energy use | stationary | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| construction feedstocks | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| iron and steel | BLASTFUR | Biomass-based | delivered biomass | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | Biomass-based | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | Biomass-based | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | Biomass-based | wholesale gas | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR | delivered coal | EJ | X | X | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS | delivered coal | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS | wholesale gas | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | delivered coal | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | H2 industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR CCS with hydrogen | wholesale gas | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | delivered coal | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | H2 industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | BLASTFUR | BLASTFUR with hydrogen | wholesale gas | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI | delivered coal | EJ | X | X | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI CCS | delivered coal | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI CCS | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI CCS | refined liquids industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | EAF with DRI CCS | wholesale gas | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | Hydrogen-based DRI | elect_td_ind | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with DRI | Hydrogen-based DRI | H2 industrial | EJ | | | X | X | X | X | X | X |
| iron and steel | EAF with scrap | EAF with scrap | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| iron and steel | EAF with scrap | EAF with scrap | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| mining energy use | mobile | electricity | elect_td_ind | EJ | | | X | X | X | X | X | X |
| mining energy use | mobile | hydrogen | H2 wholesale dispensing | EJ | | | X | X | X | X | X | X |
| mining energy use | mobile | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| mining energy use | stationary | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| mining energy use | stationary | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| mining energy use | stationary | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| mining energy use | stationary | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| mining energy use | stationary | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| N fertilizer | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| N fertilizer | coal | coal CCS | delivered coal | EJ | | | X | X | X | X | X | X |
| N fertilizer | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| N fertilizer | gas | gas CCS | wholesale gas | EJ | | | X | X | X | X | X | X |
| N fertilizer | hydrogen | hydrogen | H2 industrial | EJ | | | X | X | X | X | X | X |
| N fertilizer | hydrogen | hydrogen | wholesale gas | EJ | | | X | X | X | X | X | |
| N fertilizer | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | | | | |
| other industrial energy use | biomass | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | biomass | biomass cogen | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | coal | coal cogen | delivered coal | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | electricity | electricity | elect_td_ind | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | gas | gas cogen | wholesale gas | EJ | X | X | X | X | X | X | X | X |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| other industrial energy use | hydrogen | hydrogen | H2 industrial | EJ | | | X | X | X | X | X | X |
| other industrial energy use | hydrogen | hydrogen cogen | H2 wholesale delivery | EJ | | | X | X | X | X | X | X |
| other industrial energy use | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| other industrial energy use | refined liquids | refined liquids cogen | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| other industrial feedstocks | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| other industrial feedstocks | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| other industrial feedstocks | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| process heat cement | biomass | biomass | delivered biomass | EJ | X | X | X | X | X | X | X | X |
| process heat cement | coal | coal | delivered coal | EJ | X | X | X | X | X | X | X | X |
| process heat cement | gas | gas | wholesale gas | EJ | X | X | X | X | X | X | X | X |
| process heat cement | hydrogen | hydrogen | H2 industrial | EJ | | | X | X | X | X | X | X |
| process heat cement | refined liquids | refined liquids | refined liquids industrial | EJ | X | X | X | X | X | X | X | X |
| process heat dac | gas CCS | gas CCS | wholesale gas | EJ | | | X | X | X | X | X | X |

| sector | input | Units |
|---|---|---|
| iron and steel | delivered biomass | EJ |
| iron and steel | delivered coal | EJ |
| iron and steel | elect_td_ind | EJ |
| iron and steel | H2 industrial | EJ |
| iron and steel | refined liquids industrial | EJ |
| iron and steel | scrap | Mt |
| iron and steel | wholesale gas | EJ |

| region | Units |
|---|---|
| Africa_Eastern | MtCO2/yr |
| Africa_Northern | MtCO2/yr |
| Africa_Southern | MtCO2/yr |
| Africa_Western | MtCO2/yr |
| Argentina | MtCO2/yr |
| Australia_NZ | MtCO2/yr |
| Brazil | MtCO2/yr |
| Canada | MtCO2/yr |
| Central America and Caribbean | MtCO2/yr |
| Central Asia | MtCO2/yr |
| China | MtCO2/yr |
| Colombia | MtCO2/yr |
| EU-12 | MtCO2/yr |
| EU-15 | MtCO2/yr |
| Europe_Eastern | MtCO2/yr |
| Europe_Non_EU | MtCO2/yr |
| European Free Trade Association | MtCO2/yr |
| India | MtCO2/yr |
| Indonesia | MtCO2/yr |
| Japan | MtCO2/yr |
| Mexico | MtCO2/yr |
| Middle East | MtCO2/yr |
| Pakistan | MtCO2/yr |
| Russia | MtCO2/yr |
| South Africa | MtCO2/yr |
| South America_Northern | MtCO2/yr |
| South America_Southern | MtCO2/yr |
| South Asia | MtCO2/yr |
| South Korea | MtCO2/yr |
| Southeast Asia | MtCO2/yr |
| Taiwan | MtCO2/yr |
| USA | MtCO2/yr |

| region | sector | subsector | technology | ghg | Units |
|---|---|---|---|---|---|
| Africa_Eastern | agricultural energy use | 2W and 3W | adipic acid | BC | Gg |
| Africa_Northern | alumina | adipic acid | aerosols | BC_AWB | Tg |
| Africa_Southern | Beef | aerosols | Al_Mg | C2F6 | |
| Africa_Western | biomass | Al_Mg | biodiesel | CF4 | |
| Argentina | chemical energy use | biomass | biomass | CH4 | |
| Australia_NZ | comm cooling | biomass liquids | biomass (conv CCS) | CH4_AGR | |
| Brazil | comm heating | biomassGrass_AdrBlkSea | biomass (conv) | CH4_AWB | |
| Canada | comm others | biomassGrass_AfrCstE | biomass (IGCC CCS) | CO | |
| Central America and Caribbean | construction energy use | biomassGrass_AfrCstNE | biomass (IGCC) | CO_AWB | |
| Central Asia | Corn | biomassGrass_AfrCstNW | biomass to H2 | H2 | |
| China | Dairy | biomassGrass_AfrCstS | biomass to H2 CCS | H2_AWB | |
| Colombia | district heat | biomassGrass_AfrCstSE | biomassGrass_AdrBlkSea_IRR_hi | HFC125 | |
| EU-12 | electricity | biomassGrass_AfrCstSSW | biomassGrass_AdrBlkSea_IRR_lo | HFC134a | |
| EU-15 | electricity_net_ownuse | biomassGrass_AfrCstSW | biomassGrass_AdrBlkSea_RFD_hi | HFC143a | |
| Europe_Eastern | FiberCrop | biomassGrass_AfrCstW | biomassGrass_AdrBlkSea_RFD_lo | HFC152a | |
| Europe_Non_EU | FodderGrass | biomassGrass_AfrIntN | biomassGrass_AfrCstE_IRR_hi | HFC227ea | |
| European Free Trade Association | FodderHerb | biomassGrass_AfrIntS | biomassGrass_AfrCstE_IRR_lo | HFC23 | |
| India | Fruits | biomassGrass_AmazonR | biomassGrass_AfrCstE_RFD_hi | HFC236fa | |
| Indonesia | H2 central production | biomassGrass_AmuDaryaR | biomassGrass_AfrCstE_RFD_lo | HFC245fa | |
| Japan | H2 wholesale dispensing | biomassGrass_AmurR | biomassGrass_AfrCstNE_IRR_hi | HFC32 | |
| Mexico | industrial processes | biomassGrass_AngolaCst | biomassGrass_AfrCstNE_IRR_lo | HFC365mfc | |
| Middle East | iron and steel | biomassGrass_ArabianP | biomassGrass_AfrCstNE_RFD_hi | HFC43 | |
| Pakistan | Legumes | biomassGrass_ArabianSea | biomassGrass_AfrCstNE_RFD_lo | N2O | |
| Russia | mining energy use | biomassGrass_ArgColoR | biomassGrass_AfrCstNW_IRR_hi | N2O_AGR | |
| South Africa | MiscCrop | biomassGrass_ArgCstN | biomassGrass_AfrCstNW_IRR_lo | N2O_AWB | |
| South America_Northern | N fertilizer | biomassGrass_ArgCstS | biomassGrass_AfrCstNW_RFD_hi | NH3 | |
| South America_Southern | NutsSeeds | biomassGrass_ArkWhtRedR | biomassGrass_AfrCstNW_RFD_lo | NH3_AGR | |
| South Asia | OilCrop | biomassGrass_AusCstE | biomassGrass_AfrCstS_IRR_hi | NH3_AWB | |
| South Korea | OilPalm | biomassGrass_AusCstN | biomassGrass_AfrCstS_IRR_lo | NMVOC | |
| Southeast Asia | other industrial energy use | biomassGrass_AusCstS | biomassGrass_AfrCstS_RFD_hi | NMVOC_AGR | |
| Taiwan | OtherGrain | biomassGrass_AusCstW | biomassGrass_AfrCstS_RFD_lo | NMVOC_AWB | |
| USA | Pork | biomassGrass_AusInt | biomassGrass_AfrCstSE_IRR_hi | NOx | |
| | Poultry | biomassGrass_BalticSea | biomassGrass_AfrCstSE_IRR_lo | NOx_AGR | |
| | process heat cement | biomassGrass_BarentsSea | biomassGrass_AfrCstSE_RFD_hi | NOx_AWB | |
| | refining | biomassGrass_BengalBay | biomassGrass_AfrCstSE_RFD_lo | OC | |
| | resid cooling | biomassGrass_BengalW | biomassGrass_AfrCstSSW_IRR_hi | OC_AWB | |
| | resid heating | biomassGrass_BlackSeaN | biomassGrass_AfrCstSSW_IRR_lo | SF6 | |
| | resid others | biomassGrass_BlackSeaS | biomassGrass_AfrCstSSW_RFD_hi | SO2_1 | |
| | Rice | biomassGrass_BoHai | biomassGrass_AfrCstSSW_RFD_lo | SO2_1_AWB | |
| | RootTuber | biomassGrass_BorneoCstN | biomassGrass_AfrCstSW_IRR_hi | SO2_2 | |
| | SheepGoat | biomassGrass_BrahmaniR | biomassGrass_AfrCstSW_IRR_lo | SO2_2_AWB | |
| | Soybean | biomassGrass_BrzCstE | biomassGrass_AfrCstSW_RFD_hi | SO2_3 | |
| | SugarCrop | biomassGrass_BrzCstN | biomassGrass_AfrCstSW_RFD_lo | SO2_3_AWB | |
| | trn_aviation_intl | biomassGrass_BrzCstS | biomassGrass_AfrCstW_IRR_hi | SO2_4 | |
| | trn_freight | biomassGrass_California | biomassGrass_AfrCstW_IRR_lo | SO2_4_AWB | |
| | trn_freight_road | biomassGrass_CanAtl | biomassGrass_AfrCstW_RFD_hi | | |
| | trn_pass | biomassGrass_Caribbean | biomassGrass_AfrCstW_RFD_lo | | |
| | trn_pass_road | biomassGrass_CaspianE | biomassGrass_AfrIntN_IRR_hi | | |
| | trn_pass_road_LDV | biomassGrass_CaspianNE | biomassGrass_AfrIntN_IRR_lo | | |
| | trn_pass_road_LDV_4W | biomassGrass_CaspianSW | biomassGrass_AfrIntN_RFD_hi | | |
| | trn_shipping_intl | biomassGrass_CauveryR | biomassGrass_AfrIntN_RFD_lo | | |
| | UnmanagedLand | biomassGrass_ChaoPhrR | biomassGrass_AfrIntS_IRR_hi | | |
| | urban processes | biomassGrass_ChileCstN | biomassGrass_AfrIntS_IRR_lo | | |
| | Vegetables | biomassGrass_ChileCstS | biomassGrass_AfrIntS_RFD_hi | | |
| | Wheat | biomassGrass_ChinaCst | biomassGrass_AfrIntS_RFD_lo | | |
| | | biomassGrass_CntAmer | biomassGrass_AmazonR_IRR_hi | | |
| | | biomassGrass_ColEcuaCst | biomassGrass_AmazonR_IRR_lo | | |
| | | biomassGrass_CongoR | biomassGrass_AmazonR_RFD_hi | | |
| | | biomassGrass_DanubeR | biomassGrass_AmazonR_RFD_lo | | |
| | | biomassGrass_DaugavaR | biomassGrass_AmuDaryaR_IRR_hi | | |
| | | biomassGrass_DeadSea | biomassGrass_AmuDaryaR_IRR_lo | | |
| | | biomassGrass_DnieperR | biomassGrass_AmuDaryaR_RFD_hi | | |
| | | biomassGrass_DniesterR | biomassGrass_AmuDaryaR_RFD_lo | | |
| | | biomassGrass_DnkGrmCst | biomassGrass_AmurR_IRR_hi | | |
| | | biomassGrass_DonR | biomassGrass_AmurR_IRR_lo | | |
| | | biomassGrass_DouroR | biomassGrass_AmurR_RFD_hi | | |
| | | biomassGrass_DvinaRN | biomassGrass_AmurR_RFD_lo | | |
| | | biomassGrass_EbroR | biomassGrass_AngolaCst_IRR_hi | | |
| | | biomassGrass_EJrdnSyr | biomassGrass_AngolaCst_IRR_lo | | |
| | | biomassGrass_ElbeR | biomassGrass_AngolaCst_RFD_hi | | |
| | | biomassGrass_EmsWeserR | biomassGrass_AngolaCst_RFD_lo | | |
| | | biomassGrass_EngWales | biomassGrass_ArabianP_IRR_hi | | |
| | | biomassGrass_FarahrudR | biomassGrass_ArabianP_IRR_lo | | |
| | | biomassGrass_Finland | biomassGrass_ArabianP_RFD_hi | | |
| | | biomassGrass_FlyR | biomassGrass_ArabianP_RFD_lo | | |
| | | biomassGrass_FranceCstS | biomassGrass_ArabianSea_IRR_hi | | |
| | | biomassGrass_FranceCstW | biomassGrass_ArabianSea_IRR_lo | | |
| | | biomassGrass_FraserR | biomassGrass_ArabianSea_RFD_hi | | |
| | | biomassGrass_GangesR | biomassGrass_ArabianSea_RFD_lo | | |
| | | biomassGrass_Gironde | biomassGrass_ArgColoR_IRR_hi | | |
| | | biomassGrass_Gobi | biomassGrass_ArgColoR_IRR_lo | | |
| | | biomassGrass_GodavariR | biomassGrass_ArgColoR_RFD_hi | | |
| | | biomassGrass_GreatBasin | biomassGrass_ArgColoR_RFD_lo | | |
| | | biomassGrass_GreatLakes | biomassGrass_ArgCstN_IRR_hi | | |
| | | biomassGrass_GrijUsuR | biomassGrass_ArgCstN_IRR_lo | | |
| | | biomassGrass_GuadalqR | biomassGrass_ArgCstN_RFD_hi | | |
| | | biomassGrass_GuadianaR | biomassGrass_ArgCstN_RFD_lo | | |
| | | biomassGrass_GuineaGulf | biomassGrass_ArgCstS_IRR_hi | | |
| | | biomassGrass_Hainan | biomassGrass_ArgCstS_IRR_lo | | |
| | | biomassGrass_HamuMashR | biomassGrass_ArgCstS_RFD_hi | | |
| | | biomassGrass_Helmand | biomassGrass_ArgCstS_RFD_lo | | |
| | | biomassGrass_Hong | biomassGrass_ArkWhtRedR_IRR_hi | | |
| | | biomassGrass_HuangHeR | biomassGrass_ArkWhtRedR_IRR_lo | | |
| | | biomassGrass_HudsonBay | biomassGrass_ArkWhtRedR_RFD_hi | | |
| | | biomassGrass_IberiaCst | biomassGrass_ArkWhtRedR_RFD_lo | | |

biomassGrass_IdnE
biomassGrass_IndCstE
biomassGrass_IndCstNE
biomassGrass_IndCstS
biomassGrass_IndCstW
biomassGrass_IndusR
biomassGrass_Iran
biomassGrass_Ireland
biomassGrass_IrianJaya
biomassGrass_IrrawaddyR
biomassGrass_ItalyCstE
biomassGrass_ItalyCstW
biomassGrass_Japan
biomassGrass_JavaTimor
biomassGrass_Kalimantan
biomassGrass_Korea
biomassGrass_KrishnaR
biomassGrass_LaPuna
biomassGrass_LBalkash
biomassGrass_LChad
biomassGrass_LenaR
biomassGrass_LimpopoR
biomassGrass_LoireR
biomassGrass_Mackenzie
biomassGrass_Madagascar
biomassGrass_MagdalenaR
biomassGrass_MahanadiR
biomassGrass_MahiR
biomassGrass_MalaysiaP
biomassGrass_MarChiq
biomassGrass_MeditE
biomassGrass_MeditIsl
biomassGrass_MeditS
biomassGrass_Mekong
biomassGrass_MexBaja
biomassGrass_MexCstNW
biomassGrass_MexCstW
biomassGrass_MexGulf
biomassGrass_MexInt
biomassGrass_MissouriR
biomassGrass_MissppRN
biomassGrass_MissppRS
biomassGrass_MurrayDrlg
biomassGrass_NarmadaR
biomassGrass_NarvaR
biomassGrass_NegroR
biomassGrass_NelsonR
biomassGrass_NemanR
biomassGrass_NevaR
biomassGrass_NewZealand
biomassGrass_NigerR
biomassGrass_NileR
biomassGrass_NWTerr
biomassGrass_ObR
biomassGrass_OderR
biomassGrass_OhioR
biomassGrass_OrangeR
biomassGrass_OrinocoR
biomassGrass_PacArctic
biomassGrass_Pampas
biomassGrass_Papaloapan
biomassGrass_PapuaCst
biomassGrass_ParnaibaR
biomassGrass_Patagonia
biomassGrass_PennarR
biomassGrass_PersianGulf
biomassGrass_PeruCst
biomassGrass_Phlppns
biomassGrass_PolandCst
biomassGrass_PoR
biomassGrass_RedSeaE
biomassGrass_RhineR
biomassGrass_RhoneR
biomassGrass_RiftValley
biomassGrass_RioBalsas
biomassGrass_RioGrande
biomassGrass_RioLaPlata
biomassGrass_RioLerma
biomassGrass_RioVerde
biomassGrass_RusCstSE
biomassGrass_SabarmatiR
biomassGrass_Salinas
biomassGrass_Salween
biomassGrass_SAmerCstN
biomassGrass_SAmerCstNE
biomassGrass_SaoFrancR
biomassGrass_ScheldtR
biomassGrass_SChinaSea
biomassGrass_ScndnvN
biomassGrass_Scotland
biomassGrass_SeineR
biomassGrass_SenegalR
biomassGrass_SepikR
biomassGrass_ShebJubR
biomassGrass_SiberiaW
biomassGrass_SinaiP
biomassGrass_AusCstE_IRR_hi
biomassGrass_AusCstE_IRR_lo
biomassGrass_AusCstE_RFD_hi
biomassGrass_AusCstE_RFD_lo
biomassGrass_AusCstN_IRR_hi
biomassGrass_AusCstN_IRR_lo
biomassGrass_AusCstN_RFD_hi
biomassGrass_AusCstN_RFD_lo
biomassGrass_AusCstS_IRR_hi
biomassGrass_AusCstS_IRR_lo
biomassGrass_AusCstS_RFD_hi
biomassGrass_AusCstS_RFD_lo
biomassGrass_AusCstW_IRR_hi
biomassGrass_AusCstW_IRR_lo
biomassGrass_AusCstW_RFD_hi
biomassGrass_AusCstW_RFD_lo
biomassGrass_AusInt_IRR_hi
biomassGrass_AusInt_IRR_lo
biomassGrass_AusInt_RFD_hi
biomassGrass_AusInt_RFD_lo
biomassGrass_BalticSea_IRR_hi
biomassGrass_BalticSea_IRR_lo
biomassGrass_BalticSea_RFD_hi
biomassGrass_BalticSea_RFD_lo
biomassGrass_BarentsSea_RFD_hi
biomassGrass_BarentsSea_RFD_lo
biomassGrass_BengalBay_IRR_hi
biomassGrass_BengalBay_IRR_lo
biomassGrass_BengalBay_RFD_hi
biomassGrass_BengalBay_RFD_lo
biomassGrass_BengalW_IRR_hi
biomassGrass_BengalW_IRR_lo
biomassGrass_BengalW_RFD_hi
biomassGrass_BengalW_RFD_lo
biomassGrass_BlackSeaN_IRR_hi
biomassGrass_BlackSeaN_IRR_lo
biomassGrass_BlackSeaN_RFD_hi
biomassGrass_BlackSeaN_RFD_lo
biomassGrass_BlackSeaS_IRR_hi
biomassGrass_BlackSeaS_IRR_lo
biomassGrass_BlackSeaS_RFD_hi
biomassGrass_BlackSeaS_RFD_lo
biomassGrass_BoHai_IRR_hi
biomassGrass_BoHai_IRR_lo
biomassGrass_BoHai_RFD_hi
biomassGrass_BoHai_RFD_lo
biomassGrass_BorneoCstN_IRR_hi
biomassGrass_BorneoCstN_IRR_lo
biomassGrass_BorneoCstN_RFD_hi
biomassGrass_BorneoCstN_RFD_lo
biomassGrass_BrahmaniR_IRR_hi
biomassGrass_BrahmaniR_IRR_lo
biomassGrass_BrahmaniR_RFD_hi
biomassGrass_BrahmaniR_RFD_lo
biomassGrass_BrzCstE_IRR_hi
biomassGrass_BrzCstE_IRR_lo
biomassGrass_BrzCstE_RFD_hi
biomassGrass_BrzCstE_RFD_lo
biomassGrass_BrzCstN_IRR_hi
biomassGrass_BrzCstN_IRR_lo
biomassGrass_BrzCstN_RFD_hi
biomassGrass_BrzCstN_RFD_lo
biomassGrass_BrzCstS_IRR_hi
biomassGrass_BrzCstS_IRR_lo
biomassGrass_BrzCstS_RFD_hi
biomassGrass_BrzCstS_RFD_lo
biomassGrass_California_IRR_hi
biomassGrass_California_IRR_lo
biomassGrass_California_RFD_hi
biomassGrass_California_RFD_lo
biomassGrass_CanAtl_IRR_hi
biomassGrass_CanAtl_IRR_lo
biomassGrass_CanAtl_RFD_hi
biomassGrass_CanAtl_RFD_lo
biomassGrass_Caribbean_IRR_hi
biomassGrass_Caribbean_IRR_lo
biomassGrass_Caribbean_RFD_hi
biomassGrass_Caribbean_RFD_lo
biomassGrass_CaspianE_IRR_hi
biomassGrass_CaspianE_IRR_lo
biomassGrass_CaspianE_RFD_hi
biomassGrass_CaspianE_RFD_lo
biomassGrass_CaspianNE_IRR_hi
biomassGrass_CaspianNE_IRR_lo
biomassGrass_CaspianNE_RFD_hi
biomassGrass_CaspianNE_RFD_lo
biomassGrass_CaspianSW_IRR_hi
biomassGrass_CaspianSW_IRR_lo
biomassGrass_CaspianSW_RFD_hi
biomassGrass_CaspianSW_RFD_lo
biomassGrass_CauveryR_IRR_hi
biomassGrass_CauveryR_IRR_lo
biomassGrass_CauveryR_RFD_hi
biomassGrass_CauveryR_RFD_lo
biomassGrass_ChaoPhrR_IRR_hi
biomassGrass_ChaoPhrR_IRR_lo

biomassGrass_SittaungR
biomassGrass_SpainCstSE
biomassGrass_SriLanka
biomassGrass_StLwrncR
biomassGrass_Sulawesi
biomassGrass_Sumatra
biomassGrass_Sweden
biomassGrass_SyrDaryaR
biomassGrass_TagusR
biomassGrass_Taiwan
biomassGrass_TaptiR
biomassGrass_Tarim
biomassGrass_Tasmania
biomassGrass_Tehuantpc
biomassGrass_TennR
biomassGrass_TexasCst
biomassGrass_ThaiGulf
biomassGrass_TiberR
biomassGrass_TigrEuphR
biomassGrass_TocantinsR
biomassGrass_UralR
biomassGrass_UsaColoRN
biomassGrass_UsaColoRS
biomassGrass_UsaCstE
biomassGrass_UsaCstNE
biomassGrass_UsaCstSE
biomassGrass_UsaPacNW
biomassGrass_VietnamCst
biomassGrass_VolgaR
biomassGrass_VoltaR
biomassGrass_WislaR
biomassGrass_XunJiang
biomassGrass_Yangtze
biomassGrass_YeniseiR
biomassGrass_YucatanP
biomassGrass_ZambeziR
biomassGrass_ZiyaHe
biomassTree_AdrBlkSea
biomassTree_AfrCstE
biomassTree_AfrCstNE
biomassTree_AfrCstNW
biomassTree_AfrCstS
biomassTree_AfrCstSE
biomassTree_AfrCstSSW
biomassTree_AfrCstW
biomassTree_AfrIntN
biomassTree_AfrIntS
biomassTree_AmazonR
biomassTree_AmuDaryaR
biomassTree_AmurR
biomassTree_AngolaCst
biomassTree_ArgColoR
biomassTree_ArgCstS
biomassTree_ArkWhtRedR
biomassTree_AusCstE
biomassTree_AusCstN
biomassTree_AusCstS
biomassTree_AusCstW
biomassTree_BalticSea
biomassTree_BarentsSea
biomassTree_BengalBay
biomassTree_BengalW
biomassTree_BlackSeaN
biomassTree_BlackSeaS
biomassTree_BoHai
biomassTree_BorneoCstN
biomassTree_BrahmaniR
biomassTree_BrzCstE
biomassTree_BrzCstN
biomassTree_BrzCstS
biomassTree_California
biomassTree_CanAtl
biomassTree_Caribbean
biomassTree_CaspianE
biomassTree_CaspianNE
biomassTree_CaspianSW
biomassTree_CauveryR
biomassTree_ChaoPhrR
biomassTree_ChileCstN
biomassTree_ChileCstS
biomassTree_ChinaCst
biomassTree_ChurchillR
biomassTree_CntAmer
biomassTree_ColEcuaCst
biomassTree_CongoR
biomassTree_DanubeR
biomassTree_DaugavaR
biomassTree_DnieperR
biomassTree_DniesterR
biomassTree_DnkGrmCst
biomassTree_DonR
biomassTree_DouroR
biomassTree_DvinaRN
biomassTree_EbroR
biomassTree_ElbeR
biomassTree_EmsWeserR
biomassGrass_ChaoPhrR_RFD_hi
biomassGrass_ChaoPhrR_RFD_lo
biomassGrass_ChileCstN_IRR_hi
biomassGrass_ChileCstN_IRR_lo
biomassGrass_ChileCstN_RFD_hi
biomassGrass_ChileCstN_RFD_lo
biomassGrass_ChileCstS_IRR_hi
biomassGrass_ChileCstS_IRR_lo
biomassGrass_ChileCstS_RFD_hi
biomassGrass_ChileCstS_RFD_lo
biomassGrass_ChinaCst_IRR_hi
biomassGrass_ChinaCst_IRR_lo
biomassGrass_ChinaCst_RFD_hi
biomassGrass_ChinaCst_RFD_lo
biomassGrass_CntAmer_IRR_hi
biomassGrass_CntAmer_IRR_lo
biomassGrass_CntAmer_RFD_hi
biomassGrass_CntAmer_RFD_lo
biomassGrass_ColEcuaCst_IRR_hi
biomassGrass_ColEcuaCst_IRR_lo
biomassGrass_ColEcuaCst_RFD_hi
biomassGrass_ColEcuaCst_RFD_lo
biomassGrass_CongoR_IRR_hi
biomassGrass_CongoR_IRR_lo
biomassGrass_CongoR_RFD_hi
biomassGrass_CongoR_RFD_lo
biomassGrass_DanubeR_IRR_hi
biomassGrass_DanubeR_IRR_lo
biomassGrass_DanubeR_RFD_hi
biomassGrass_DanubeR_RFD_lo
biomassGrass_DaugavaR_IRR_hi
biomassGrass_DaugavaR_IRR_lo
biomassGrass_DaugavaR_RFD_hi
biomassGrass_DaugavaR_RFD_lo
biomassGrass_DeadSea_IRR_hi
biomassGrass_DeadSea_IRR_lo
biomassGrass_DeadSea_RFD_hi
biomassGrass_DeadSea_RFD_lo
biomassGrass_DnieperR_IRR_hi
biomassGrass_DnieperR_IRR_lo
biomassGrass_DnieperR_RFD_hi
biomassGrass_DnieperR_RFD_lo
biomassGrass_DniesterR_IRR_hi
biomassGrass_DniesterR_IRR_lo
biomassGrass_DniesterR_RFD_hi
biomassGrass_DniesterR_RFD_lo
biomassGrass_DnkGrmCst_IRR_hi
biomassGrass_DnkGrmCst_IRR_lo
biomassGrass_DnkGrmCst_RFD_hi
biomassGrass_DnkGrmCst_RFD_lo
biomassGrass_DonR_IRR_hi
biomassGrass_DonR_IRR_lo
biomassGrass_DonR_RFD_hi
biomassGrass_DonR_RFD_lo
biomassGrass_DouroR_IRR_hi
biomassGrass_DouroR_IRR_lo
biomassGrass_DouroR_RFD_hi
biomassGrass_DouroR_RFD_lo
biomassGrass_DvinaRN_IRR_hi
biomassGrass_DvinaRN_IRR_lo
biomassGrass_DvinaRN_RFD_hi
biomassGrass_DvinaRN_RFD_lo
biomassGrass_EbroR_IRR_hi
biomassGrass_EbroR_IRR_lo
biomassGrass_EbroR_RFD_hi
biomassGrass_EbroR_RFD_lo
biomassGrass_EJrdnSyr_IRR_hi
biomassGrass_EJrdnSyr_IRR_lo
biomassGrass_EJrdnSyr_RFD_hi
biomassGrass_EJrdnSyr_RFD_lo
biomassGrass_ElbeR_IRR_hi
biomassGrass_ElbeR_IRR_lo
biomassGrass_ElbeR_RFD_hi
biomassGrass_ElbeR_RFD_lo
biomassGrass_EmsWeserR_IRR_hi
biomassGrass_EmsWeserR_IRR_lo
biomassGrass_EmsWeserR_RFD_hi
biomassGrass_EmsWeserR_RFD_lo
biomassGrass_EngWales_IRR_hi
biomassGrass_EngWales_IRR_lo
biomassGrass_EngWales_RFD_hi
biomassGrass_EngWales_RFD_lo
biomassGrass_FarahrudR_IRR_hi
biomassGrass_FarahrudR_IRR_lo
biomassGrass_FarahrudR_RFD_hi
biomassGrass_FarahrudR_RFD_lo
biomassGrass_Finland_IRR_hi
biomassGrass_Finland_IRR_lo
biomassGrass_Finland_RFD_hi
biomassGrass_Finland_RFD_lo
biomassGrass_FlyR_RFD_hi
biomassGrass_FlyR_RFD_lo
biomassGrass_FranceCstS_IRR_hi
biomassGrass_FranceCstS_IRR_lo
biomassGrass_FranceCstS_RFD_hi
biomassGrass_FranceCstS_RFD_lo

biomassTree_EngWales
biomassTree_Finland
biomassTree_FlyR
biomassTree_FranceCstS
biomassTree_FranceCstW
biomassTree_FraserR
biomassTree_GangesR
biomassTree_Gironde
biomassTree_Gobi
biomassTree_GodavariR
biomassTree_GreatBasin
biomassTree_GreatLakes
biomassTree_GrijUsuR
biomassTree_GuadalqR
biomassTree_GuadianaR
biomassTree_GuineaGulf
biomassTree_Hainan
biomassTree_Hong
biomassTree_HuangHeR
biomassTree_HudsonBay
biomassTree_IberiaCst
biomassTree_Iceland
biomassTree_IdnE
biomassTree_IndCstE
biomassTree_IndCstNE
biomassTree_IndCstS
biomassTree_IndCstW
biomassTree_IndusR
biomassTree_Ireland
biomassTree_IrianJaya
biomassTree_IrrawaddyR
biomassTree_ItalyCstE
biomassTree_ItalyCstW
biomassTree_Japan
biomassTree_JavaTimor
biomassTree_Kalimantan
biomassTree_KaraSea
biomassTree_Korea
biomassTree_KrishnaR
biomassTree_LaPuna
biomassTree_LBalkash
biomassTree_LChad
biomassTree_LenaR
biomassTree_LimpopoR
biomassTree_LoireR
biomassTree_Mackenzie
biomassTree_Madagascar
biomassTree_MagdalenaR
biomassTree_MahanadiR
biomassTree_MahiR
biomassTree_MalaysiaP
biomassTree_MarChiq
biomassTree_MeditE
biomassTree_MeditIsl
biomassTree_MeditS
biomassTree_Mekong
biomassTree_MexBaja
biomassTree_MexCstNW
biomassTree_MexCstW
biomassTree_MexGulf
biomassTree_MexInt
biomassTree_MissouriR
biomassTree_MissppRN
biomassTree_MissppRS
biomassTree_MurrayDrlg
biomassTree_NarmadaR
biomassTree_NarvaR
biomassTree_NegroR
biomassTree_NelsonR
biomassTree_NemanR
biomassTree_NevaR
biomassTree_NewCaledn
biomassTree_NewZealand
biomassTree_NigerR
biomassTree_NileR
biomassTree_NWTerr
biomassTree_ObR
biomassTree_OderR
biomassTree_OhioR
biomassTree_OrangeR
biomassTree_OrinocoR
biomassTree_PacArctic
biomassTree_Pampas
biomassTree_Papaloapan
biomassTree_PapuaCst
biomassTree_ParnaibaR
biomassTree_Patagonia
biomassTree_PennarR
biomassTree_PeruCst
biomassTree_Phlppns
biomassTree_PolandCst
biomassTree_PoR
biomassTree_RhineR
biomassTree_RhoneR
biomassTree_RiftValley
biomassTree_RioBalsas
biomassGrass_FranceCstW_IRR_hi
biomassGrass_FranceCstW_IRR_lo
biomassGrass_FranceCstW_RFD_hi
biomassGrass_FranceCstW_RFD_lo
biomassGrass_FraserR_IRR_hi
biomassGrass_FraserR_IRR_lo
biomassGrass_FraserR_RFD_hi
biomassGrass_FraserR_RFD_lo
biomassGrass_GangesR_IRR_hi
biomassGrass_GangesR_IRR_lo
biomassGrass_GangesR_RFD_hi
biomassGrass_GangesR_RFD_lo
biomassGrass_Gironde_IRR_hi
biomassGrass_Gironde_IRR_lo
biomassGrass_Gironde_RFD_hi
biomassGrass_Gironde_RFD_lo
biomassGrass_Gobi_IRR_hi
biomassGrass_Gobi_IRR_lo
biomassGrass_Gobi_RFD_hi
biomassGrass_Gobi_RFD_lo
biomassGrass_GodavariR_IRR_hi
biomassGrass_GodavariR_IRR_lo
biomassGrass_GodavariR_RFD_hi
biomassGrass_GodavariR_RFD_lo
biomassGrass_GreatBasin_IRR_hi
biomassGrass_GreatBasin_IRR_lo
biomassGrass_GreatBasin_RFD_hi
biomassGrass_GreatBasin_RFD_lo
biomassGrass_GreatLakes_IRR_hi
biomassGrass_GreatLakes_IRR_lo
biomassGrass_GreatLakes_RFD_hi
biomassGrass_GreatLakes_RFD_lo
biomassGrass_GrijUsuR_IRR_hi
biomassGrass_GrijUsuR_IRR_lo
biomassGrass_GrijUsuR_RFD_hi
biomassGrass_GrijUsuR_RFD_lo
biomassGrass_GuadalqR_IRR_hi
biomassGrass_GuadalqR_IRR_lo
biomassGrass_GuadalqR_RFD_hi
biomassGrass_GuadalqR_RFD_lo
biomassGrass_GuadianaR_IRR_hi
biomassGrass_GuadianaR_IRR_lo
biomassGrass_GuadianaR_RFD_hi
biomassGrass_GuadianaR_RFD_lo
biomassGrass_GuineaGulf_IRR_hi
biomassGrass_GuineaGulf_IRR_lo
biomassGrass_GuineaGulf_RFD_hi
biomassGrass_GuineaGulf_RFD_lo
biomassGrass_Hainan_IRR_hi
biomassGrass_Hainan_IRR_lo
biomassGrass_Hainan_RFD_hi
biomassGrass_Hainan_RFD_lo
biomassGrass_HamuMashR_IRR_hi
biomassGrass_HamuMashR_IRR_lo
biomassGrass_HamuMashR_RFD_hi
biomassGrass_HamuMashR_RFD_lo
biomassGrass_Helmand_IRR_hi
biomassGrass_Helmand_IRR_lo
biomassGrass_Helmand_RFD_hi
biomassGrass_Helmand_RFD_lo
biomassGrass_Hong_IRR_hi
biomassGrass_Hong_IRR_lo
biomassGrass_Hong_RFD_hi
biomassGrass_Hong_RFD_lo
biomassGrass_HuangHeR_IRR_hi
biomassGrass_HuangHeR_IRR_lo
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biomassGrass_HudsonBay_IRR_hi
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biomassGrass_HudsonBay_RFD_hi
biomassGrass_HudsonBay_RFD_lo
biomassGrass_IberiaCst_IRR_hi
biomassGrass_IberiaCst_IRR_lo
biomassGrass_IberiaCst_RFD_hi
biomassGrass_IberiaCst_RFD_lo
biomassGrass_IdnE_IRR_hi
biomassGrass_IdnE_IRR_lo
biomassGrass_IdnE_RFD_hi
biomassGrass_IdnE_RFD_lo
biomassGrass_IndCstE_IRR_hi
biomassGrass_IndCstE_IRR_lo
biomassGrass_IndCstE_RFD_hi
biomassGrass_IndCstE_RFD_lo
biomassGrass_IndCstNE_IRR_hi
biomassGrass_IndCstNE_IRR_lo
biomassGrass_IndCstNE_RFD_hi
biomassGrass_IndCstNE_RFD_lo
biomassGrass_IndCstS_IRR_hi
biomassGrass_IndCstS_IRR_lo
biomassGrass_IndCstS_RFD_hi
biomassGrass_IndCstS_RFD_lo
biomassGrass_IndCstW_IRR_hi
biomassGrass_IndCstW_IRR_lo
biomassGrass_IndCstW_RFD_hi
biomassGrass_IndCstW_RFD_lo

biomassTree_RioGrande
biomassTree_RioLaPlata
biomassTree_RioLerma
biomassTree_RioVerde
biomassTree_RusCstSE
biomassTree_SabarmatiR
biomassTree_Salinas
biomassTree_Salween
biomassTree_SAmerCstN
biomassTree_SAmerCstNE
biomassTree_SaoFrancR
biomassTree_ScheldtR
biomassTree_SChinaSea
biomassTree_ScndnvN
biomassTree_Scotland
biomassTree_SeineR
biomassTree_SenegalR
biomassTree_SepikR
biomassTree_ShebJubR
biomassTree_SiberiaN
biomassTree_SiberiaW
biomassTree_SittaungR
biomassTree_SolomonIsl
biomassTree_SpainCstSE
biomassTree_SriLanka
biomassTree_StLwrncR
biomassTree_Sulawesi
biomassTree_Sumatra
biomassTree_Sweden
biomassTree_SyrDaryaR
biomassTree_TagusR
biomassTree_Taiwan
biomassTree_TaptiR
biomassTree_Tasmania
biomassTree_Tehuantpc
biomassTree_TennR
biomassTree_TexasCst
biomassTree_ThaiGulf
biomassTree_TiberR
biomassTree_TigrEuphR
biomassTree_TocantinsR
biomassTree_UralR
biomassTree_UsaColoRN
biomassTree_UsaColoRS
biomassTree_UsaCstE
biomassTree_UsaCstNE
biomassTree_UsaCstSE
biomassTree_UsaPacNW
biomassTree_VietnamCst
biomassTree_VolgaR
biomassTree_VoltaR
biomassTree_WislaR
biomassTree_XunJiang
biomassTree_Yangtze
biomassTree_YeniseiR
biomassTree_YucatanP
biomassTree_ZambeziR
biomassTree_ZiyaHe
BLASTFUR
Bus
Car
coal
coal to liquids
CornC4_AdrBlkSea
CornC4_AfrCstE
CornC4_AfrCstNE
CornC4_AfrCstNW
CornC4_AfrCstS
CornC4_AfrCstSE
CornC4_AfrCstSSW
CornC4_AfrCstSW
CornC4_AfrCstW
CornC4_AfrIntN
CornC4_AfrIntS
CornC4_AmazonR
CornC4_AmuDaryaR
CornC4_AmurR
CornC4_AngolaCst
CornC4_ArabianP
CornC4_ArabianSea
CornC4_ArgColoR
CornC4_ArgCstN
CornC4_ArgCstS
CornC4_ArkWhtRedR
CornC4_AusCstE
CornC4_AusCstN
CornC4_AusCstS
CornC4_AusCstW
CornC4_AusInt
CornC4_BalticSea
CornC4_BarentsSea
CornC4_BengalBay
CornC4_BengalW
CornC4_BlackSeaN
CornC4_BlackSeaS
CornC4_BoHai
biomassGrass_IndusR_IRR_hi
biomassGrass_IndusR_IRR_lo
biomassGrass_IndusR_RFD_hi
biomassGrass_IndusR_RFD_lo
biomassGrass_Iran_IRR_hi
biomassGrass_Iran_IRR_lo
biomassGrass_Iran_RFD_hi
biomassGrass_Iran_RFD_lo
biomassGrass_Ireland_IRR_hi
biomassGrass_Ireland_IRR_lo
biomassGrass_Ireland_RFD_hi
biomassGrass_Ireland_RFD_lo
biomassGrass_IrianJaya_IRR_hi
biomassGrass_IrianJaya_IRR_lo
biomassGrass_IrianJaya_RFD_hi
biomassGrass_IrianJaya_RFD_lo
biomassGrass_IrrawaddyR_IRR_hi
biomassGrass_IrrawaddyR_IRR_lo
biomassGrass_IrrawaddyR_RFD_hi
biomassGrass_IrrawaddyR_RFD_lo
biomassGrass_ItalyCstE_IRR_hi
biomassGrass_ItalyCstE_IRR_lo
biomassGrass_ItalyCstE_RFD_hi
biomassGrass_ItalyCstE_RFD_lo
biomassGrass_ItalyCstW_IRR_hi
biomassGrass_ItalyCstW_IRR_lo
biomassGrass_ItalyCstW_RFD_hi
biomassGrass_ItalyCstW_RFD_lo
biomassGrass_Japan_IRR_hi
biomassGrass_Japan_IRR_lo
biomassGrass_Japan_RFD_hi
biomassGrass_Japan_RFD_lo
biomassGrass_JavaTimor_IRR_hi
biomassGrass_JavaTimor_IRR_lo
biomassGrass_JavaTimor_RFD_hi
biomassGrass_JavaTimor_RFD_lo
biomassGrass_Kalimantan_IRR_hi
biomassGrass_Kalimantan_IRR_lo
biomassGrass_Kalimantan_RFD_hi
biomassGrass_Kalimantan_RFD_lo
biomassGrass_Korea_IRR_hi
biomassGrass_Korea_IRR_lo
biomassGrass_Korea_RFD_hi
biomassGrass_Korea_RFD_lo
biomassGrass_KrishnaR_IRR_hi
biomassGrass_KrishnaR_IRR_lo
biomassGrass_KrishnaR_RFD_hi
biomassGrass_KrishnaR_RFD_lo
biomassGrass_LaPuna_IRR_hi
biomassGrass_LaPuna_IRR_lo
biomassGrass_LaPuna_RFD_hi
biomassGrass_LaPuna_RFD_lo
biomassGrass_LBalkash_IRR_hi
biomassGrass_LBalkash_IRR_lo
biomassGrass_LBalkash_RFD_hi
biomassGrass_LBalkash_RFD_lo
biomassGrass_LChad_IRR_hi
biomassGrass_LChad_IRR_lo
biomassGrass_LChad_RFD_hi
biomassGrass_LChad_RFD_lo
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biomassGrass_LenaR_RFD_hi
biomassGrass_LenaR_RFD_lo
biomassGrass_LimpopoR_IRR_hi
biomassGrass_LimpopoR_IRR_lo
biomassGrass_LimpopoR_RFD_hi
biomassGrass_LimpopoR_RFD_lo
biomassGrass_LoireR_IRR_hi
biomassGrass_LoireR_IRR_lo
biomassGrass_LoireR_RFD_hi
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biomassGrass_Mackenzie_IRR_hi
biomassGrass_Mackenzie_IRR_lo
biomassGrass_Mackenzie_RFD_hi
biomassGrass_Mackenzie_RFD_lo
biomassGrass_Madagascar_IRR_hi
biomassGrass_Madagascar_IRR_lo
biomassGrass_Madagascar_RFD_hi
biomassGrass_Madagascar_RFD_lo
biomassGrass_MagdalenaR_IRR_hi
biomassGrass_MagdalenaR_IRR_lo
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biomassGrass_MahiR_IRR_hi
biomassGrass_MahiR_IRR_lo
biomassGrass_MahiR_RFD_hi
biomassGrass_MahiR_RFD_lo
biomassGrass_MalaysiaP_IRR_hi
biomassGrass_MalaysiaP_IRR_lo
biomassGrass_MalaysiaP_RFD_hi
biomassGrass_MalaysiaP_RFD_lo

CornC4_BorneoCstN
CornC4_BrahmaniR
CornC4_BrzCstE
CornC4_BrzCstN
CornC4_BrzCstS
CornC4_California
CornC4_CanAtl
CornC4_Caribbean
CornC4_CaspianE
CornC4_CaspianNE
CornC4_CaspianSW
CornC4_CauveryR
CornC4_ChaoPhrR
CornC4_ChileCstN
CornC4_ChileCstS
CornC4_ChinaCst
CornC4_CntAmer
CornC4_ColEcuaCst
CornC4_CongoR
CornC4_DanubeR
CornC4_DaugavaR
CornC4_DeadSea
CornC4_DnieperR
CornC4_DniesterR
CornC4_DnkGrmCst
CornC4_DonR
CornC4_DouroR
CornC4_DvinaRN
CornC4_EbroR
CornC4_EJrdnSyr
CornC4_ElbeR
CornC4_EmsWeserR
CornC4_FarahrudR
CornC4_Finland
CornC4_FlyR
CornC4_FranceCstS
CornC4_FranceCstW
CornC4_FraserR
CornC4_GangesR
CornC4_Gironde
CornC4_Gobi
CornC4_GodavariR
CornC4_GreatBasin
CornC4_GreatLakes
CornC4_GrijUsuR
CornC4_GuadalqR
CornC4_GuadianaR
CornC4_GuineaGulf
CornC4_Hainan
CornC4_HamuMashR
CornC4_Helmand
CornC4_Hong
CornC4_HuangHeR
CornC4_HudsonBay
CornC4_IberiaCst
CornC4_IdnE
CornC4_IndCstE
CornC4_IndCstNE
CornC4_IndCstS
CornC4_IndCstW
CornC4_IndusR
CornC4_Iran
CornC4_IrianJaya
CornC4_IrrawaddyR
CornC4_ItalyCstE
CornC4_ItalyCstW
CornC4_Japan
CornC4_JavaTimor
CornC4_Kalimantan
CornC4_Korea
CornC4_KrishnaR
CornC4_LaPuna
CornC4_LBalkash
CornC4_LChad
CornC4_LenaR
CornC4_LimpopoR
CornC4_LoireR
CornC4_Mackenzie
CornC4_Madagascar
CornC4_MagdalenaR
CornC4_MahanadiR
CornC4_MahiR
CornC4_MalaysiaP
CornC4_MarChiq
CornC4_MeditE
CornC4_MeditIsl
CornC4_MeditS
CornC4_Mekong
CornC4_MexBaja
CornC4_MexCstNW
CornC4_MexCstW
CornC4_MexGulf
CornC4_MexInt
CornC4_MissouriR
CornC4_MissppRN
CornC4_MissppRS

biomassGrass_MarChiq_IRR_hi
biomassGrass_MarChiq_IRR_lo
biomassGrass_MarChiq_RFD_hi
biomassGrass_MarChiq_RFD_lo
biomassGrass_MeditE_IRR_hi
biomassGrass_MeditE_IRR_lo
biomassGrass_MeditE_RFD_hi
biomassGrass_MeditE_RFD_lo
biomassGrass_MeditIsl_IRR_hi
biomassGrass_MeditIsl_IRR_lo
biomassGrass_MeditIsl_RFD_hi
biomassGrass_MeditIsl_RFD_lo
biomassGrass_MeditS_IRR_hi
biomassGrass_MeditS_IRR_lo
biomassGrass_MeditS_RFD_hi
biomassGrass_MeditS_RFD_lo
biomassGrass_Mekong_IRR_hi
biomassGrass_Mekong_IRR_lo
biomassGrass_Mekong_RFD_hi
biomassGrass_Mekong_RFD_lo
biomassGrass_MexBaja_IRR_hi
biomassGrass_MexBaja_IRR_lo
biomassGrass_MexBaja_RFD_hi
biomassGrass_MexBaja_RFD_lo
biomassGrass_MexCstNW_IRR_hi
biomassGrass_MexCstNW_IRR_lo
biomassGrass_MexCstNW_RFD_hi
biomassGrass_MexCstNW_RFD_lo
biomassGrass_MexCstW_IRR_hi
biomassGrass_MexCstW_IRR_lo
biomassGrass_MexCstW_RFD_hi
biomassGrass_MexCstW_RFD_lo
biomassGrass_MexGulf_IRR_hi
biomassGrass_MexGulf_IRR_lo
biomassGrass_MexGulf_RFD_hi
biomassGrass_MexGulf_RFD_lo
biomassGrass_MexInt_IRR_hi
biomassGrass_MexInt_IRR_lo
biomassGrass_MexInt_RFD_hi
biomassGrass_MexInt_RFD_lo
biomassGrass_MissouriR_IRR_hi
biomassGrass_MissouriR_IRR_lo
biomassGrass_MissouriR_RFD_hi
biomassGrass_MissouriR_RFD_lo
biomassGrass_MissppRN_IRR_hi
biomassGrass_MissppRN_IRR_lo
biomassGrass_MissppRN_RFD_hi
biomassGrass_MissppRN_RFD_lo
biomassGrass_MissppRS_IRR_hi
biomassGrass_MissppRS_IRR_lo
biomassGrass_MissppRS_RFD_hi
biomassGrass_MissppRS_RFD_lo
biomassGrass_MurrayDrlg_IRR_hi
biomassGrass_MurrayDrlg_IRR_lo
biomassGrass_MurrayDrlg_RFD_hi
biomassGrass_MurrayDrlg_RFD_lo
biomassGrass_NarmadaR_IRR_hi
biomassGrass_NarmadaR_IRR_lo
biomassGrass_NarmadaR_RFD_hi
biomassGrass_NarmadaR_RFD_lo
biomassGrass_NarvaR_IRR_hi
biomassGrass_NarvaR_IRR_lo
biomassGrass_NarvaR_RFD_hi
biomassGrass_NarvaR_RFD_lo
biomassGrass_NegroR_IRR_hi
biomassGrass_NegroR_IRR_lo
biomassGrass_NegroR_RFD_hi
biomassGrass_NegroR_RFD_lo
biomassGrass_NelsonR_IRR_hi
biomassGrass_NelsonR_IRR_lo
biomassGrass_NelsonR_RFD_hi
biomassGrass_NelsonR_RFD_lo
biomassGrass_NemanR_IRR_hi
biomassGrass_NemanR_IRR_lo
biomassGrass_NemanR_RFD_hi
biomassGrass_NemanR_RFD_lo
biomassGrass_NevaR_IRR_hi
biomassGrass_NevaR_IRR_lo
biomassGrass_NevaR_RFD_hi
biomassGrass_NevaR_RFD_lo
biomassGrass_NewZealand_IRR_hi
biomassGrass_NewZealand_IRR_lo
biomassGrass_NewZealand_RFD_hi
biomassGrass_NewZealand_RFD_lo
biomassGrass_NigerR_IRR_hi
biomassGrass_NigerR_IRR_lo
biomassGrass_NigerR_RFD_hi
biomassGrass_NigerR_RFD_lo
biomassGrass_NileR_IRR_hi
biomassGrass_NileR_IRR_lo
biomassGrass_NileR_RFD_hi
biomassGrass_NileR_RFD_lo
biomassGrass_NWTerr_IRR_hi
biomassGrass_NWTerr_RFD_hi
biomassGrass_NWTerr_RFD_lo
biomassGrass_ObR_IRR_hi

| | |
|---|---|
| CornC4_MurrayDrlg | biomassGrass_ObR_IRR_lo |
| CornC4_NarmadaR | biomassGrass_ObR_RFD_hi |
| CornC4_NarvaR | biomassGrass_ObR_RFD_lo |
| CornC4_NegroR | biomassGrass_OderR_IRR_hi |
| CornC4_NelsonR | biomassGrass_OderR_IRR_lo |
| CornC4_NemanR | biomassGrass_OderR_RFD_hi |
| CornC4_NevaR | biomassGrass_OderR_RFD_lo |
| CornC4_NewCaledn | biomassGrass_OhioR_IRR_hi |
| CornC4_NewZealand | biomassGrass_OhioR_IRR_lo |
| CornC4_NigerR | biomassGrass_OhioR_RFD_hi |
| CornC4_NileR | biomassGrass_OhioR_RFD_lo |
| CornC4_NWTerr | biomassGrass_OrangeR_IRR_hi |
| CornC4_ObR | biomassGrass_OrangeR_IRR_lo |
| CornC4_OderR | biomassGrass_OrangeR_RFD_hi |
| CornC4_OhioR | biomassGrass_OrangeR_RFD_lo |
| CornC4_OrangeR | biomassGrass_OrinocoR_IRR_hi |
| CornC4_OrinocoR | biomassGrass_OrinocoR_IRR_lo |
| CornC4_PacArctic | biomassGrass_OrinocoR_RFD_hi |
| CornC4_Pampas | biomassGrass_OrinocoR_RFD_lo |
| CornC4_Papaloapan | biomassGrass_PacArctic_IRR_hi |
| CornC4_PapuaCst | biomassGrass_PacArctic_IRR_lo |
| CornC4_ParnaibaR | biomassGrass_PacArctic_RFD_hi |
| CornC4_PennarR | biomassGrass_PacArctic_RFD_lo |
| CornC4_PersianGulf | biomassGrass_Pampas_IRR_hi |
| CornC4_PeruCst | biomassGrass_Pampas_IRR_lo |
| CornC4_Phlppns | biomassGrass_Pampas_RFD_hi |
| CornC4_PolandCst | biomassGrass_Pampas_RFD_lo |
| CornC4_PoR | biomassGrass_Papaloapan_IRR_hi |
| CornC4_RedSeaE | biomassGrass_Papaloapan_IRR_lo |
| CornC4_RhineR | biomassGrass_Papaloapan_RFD_hi |
| CornC4_RhoneR | biomassGrass_Papaloapan_RFD_lo |
| CornC4_RiftValley | biomassGrass_PapuaCst_RFD_hi |
| CornC4_RioBalsas | biomassGrass_PapuaCst_RFD_lo |
| CornC4_RioGrande | biomassGrass_ParnaibaR_IRR_hi |
| CornC4_RioLaPlata | biomassGrass_ParnaibaR_IRR_lo |
| CornC4_RioLerma | biomassGrass_ParnaibaR_RFD_hi |
| CornC4_RioVerde | biomassGrass_ParnaibaR_RFD_lo |
| CornC4_RusCstSE | biomassGrass_Patagonia_IRR_hi |
| CornC4_SabarmatiR | biomassGrass_Patagonia_IRR_lo |
| CornC4_Salinas | biomassGrass_Patagonia_RFD_hi |
| CornC4_Salween | biomassGrass_Patagonia_RFD_lo |
| CornC4_SAmerCstN | biomassGrass_PennarR_IRR_hi |
| CornC4_SAmerCstNE | biomassGrass_PennarR_IRR_lo |
| CornC4_SaoFrancR | biomassGrass_PennarR_RFD_hi |
| CornC4_ScheldtR | biomassGrass_PennarR_RFD_lo |
| CornC4_SChinaSea | biomassGrass_PersianGulf_IRR_hi |
| CornC4_ScndnvN | biomassGrass_PersianGulf_IRR_lo |
| CornC4_SeineR | biomassGrass_PersianGulf_RFD_hi |
| CornC4_SenegalR | biomassGrass_PersianGulf_RFD_lo |
| CornC4_SepikR | biomassGrass_PeruCst_IRR_hi |
| CornC4_ShebJubR | biomassGrass_PeruCst_IRR_lo |
| CornC4_SiberiaW | biomassGrass_PeruCst_RFD_hi |
| CornC4_SinaiP | biomassGrass_PeruCst_RFD_lo |
| CornC4_SittaungR | biomassGrass_Phlppns_IRR_hi |
| CornC4_SpainCstSE | biomassGrass_Phlppns_IRR_lo |
| CornC4_SriLanka | biomassGrass_Phlppns_RFD_hi |
| CornC4_StLwrncR | biomassGrass_Phlppns_RFD_lo |
| CornC4_Sulawesi | biomassGrass_PolandCst_IRR_hi |
| CornC4_Sumatra | biomassGrass_PolandCst_IRR_lo |
| CornC4_Sweden | biomassGrass_PolandCst_RFD_hi |
| CornC4_SyrDaryaR | biomassGrass_PolandCst_RFD_lo |
| CornC4_TagusR | biomassGrass_PoR_IRR_hi |
| CornC4_Taiwan | biomassGrass_PoR_IRR_lo |
| CornC4_TaptiR | biomassGrass_PoR_RFD_hi |
| CornC4_Tarim | biomassGrass_PoR_RFD_lo |
| CornC4_Tasmania | biomassGrass_RedSeaE_IRR_hi |
| CornC4_Tehuantpc | biomassGrass_RedSeaE_IRR_lo |
| CornC4_TennR | biomassGrass_RedSeaE_RFD_hi |
| CornC4_TexasCst | biomassGrass_RedSeaE_RFD_lo |
| CornC4_ThaiGulf | biomassGrass_RhineR_IRR_hi |
| CornC4_TiberR | biomassGrass_RhineR_IRR_lo |
| CornC4_TigrEuphR | biomassGrass_RhineR_RFD_hi |
| CornC4_TocantinsR | biomassGrass_RhineR_RFD_lo |
| CornC4_UralR | biomassGrass_RhoneR_IRR_hi |
| CornC4_UsaColoRN | biomassGrass_RhoneR_IRR_lo |
| CornC4_UsaColoRS | biomassGrass_RhoneR_RFD_hi |
| CornC4_UsaCstE | biomassGrass_RhoneR_RFD_lo |
| CornC4_UsaCstNE | biomassGrass_RiftValley_IRR_hi |
| CornC4_UsaCstSE | biomassGrass_RiftValley_IRR_lo |
| CornC4_UsaPacNW | biomassGrass_RiftValley_RFD_hi |
| CornC4_VietnamCst | biomassGrass_RiftValley_RFD_lo |
| CornC4_VolgaR | biomassGrass_RioBalsas_IRR_hi |
| CornC4_VoltaR | biomassGrass_RioBalsas_IRR_lo |
| CornC4_WislaR | biomassGrass_RioBalsas_RFD_hi |
| CornC4_XunJiang | biomassGrass_RioBalsas_RFD_lo |
| CornC4_Yangtze | biomassGrass_RioGrande_IRR_hi |
| CornC4_YeniseiR | biomassGrass_RioGrande_IRR_lo |
| CornC4_YucatanP | biomassGrass_RioGrande_RFD_hi |
| CornC4_ZambeziR | biomassGrass_RioGrande_RFD_lo |
| CornC4_ZiyaHe | biomassGrass_RioLaPlata_IRR_hi |
| Deforest_AdrBlkSea | biomassGrass_RioLaPlata_IRR_lo |
| Deforest_AfrCstE | biomassGrass_RioLaPlata_RFD_hi |
| Deforest_AfrCstS | biomassGrass_RioLaPlata_RFD_lo |
| Deforest_AfrCstSE | biomassGrass_RioLerma_IRR_hi |
| Deforest_AfrCstW | biomassGrass_RioLerma_IRR_lo |
| Deforest_AfrIntS | biomassGrass_RioLerma_RFD_hi |

Deforest_AmazonR
Deforest_AmuDaryaR
Deforest_AmurR
Deforest_AngolaCst
Deforest_ArgColoR
Deforest_ArgCstS
Deforest_ArkWhtRedR
Deforest_AusCstE
Deforest_AusCstN
Deforest_AusCstS
Deforest_AusCstW
Deforest_BalticSea
Deforest_BarentsSea
Deforest_BengalBay
Deforest_BlackSeaN
Deforest_BlackSeaS
Deforest_BoHai
Deforest_BorneoCstN
Deforest_BrzCstE
Deforest_BrzCstN
Deforest_BrzCstS
Deforest_California
Deforest_CanAtl
Deforest_Caribbean
Deforest_CaspianE
Deforest_CaspianNE
Deforest_CaspianSW
Deforest_ChaoPhrR
Deforest_ChileCstN
Deforest_ChileCstS
Deforest_ChinaCst
Deforest_ChurchillR
Deforest_CntAmer
Deforest_ColEcuaCst
Deforest_CongoR
Deforest_DanubeR
Deforest_DaugavaR
Deforest_DnieperR
Deforest_DniesterR
Deforest_DnkGrmCst
Deforest_DonR
Deforest_DouroR
Deforest_DvinaRN
Deforest_EbroR
Deforest_ElbeR
Deforest_EmsWeserR
Deforest_EngWales
Deforest_Finland
Deforest_FlyR
Deforest_FranceCstS
Deforest_FranceCstW
Deforest_FraserR
Deforest_GangesR
Deforest_Gironde
Deforest_Gobi
Deforest_GreatBasin
Deforest_GreatLakes
Deforest_GrijUsuR
Deforest_GuadalqR
Deforest_GuadianaR
Deforest_GuineaGulf
Deforest_Hong
Deforest_HudsonBay
Deforest_IberiaCst
Deforest_Iceland
Deforest_IdnE
Deforest_Iran
Deforest_Ireland
Deforest_IrianJaya
Deforest_IrrawaddyR
Deforest_ItalyCstE
Deforest_ItalyCstW
Deforest_Japan
Deforest_JavaTimor
Deforest_Kalimantan
Deforest_KaraSea
Deforest_Korea
Deforest_LaPuna
Deforest_LBalkash
Deforest_LChad
Deforest_LenaR
Deforest_LimpopoR
Deforest_LoireR
Deforest_Mackenzie
Deforest_MagdalenaR
Deforest_MalaysiaP
Deforest_MarChiq
Deforest_MeditE
Deforest_MeditIsl
Deforest_Mekong
Deforest_MexBaja
Deforest_MexCstNW
Deforest_MexCstW
Deforest_MexGulf
Deforest_MexInt
Deforest_MissouriR
biomassGrass_RioLerma_RFD_lo
biomassGrass_RioVerde_IRR_hi
biomassGrass_RioVerde_IRR_lo
biomassGrass_RioVerde_RFD_hi
biomassGrass_RioVerde_RFD_lo
biomassGrass_RusCstSE_IRR_hi
biomassGrass_RusCstSE_IRR_lo
biomassGrass_RusCstSE_RFD_hi
biomassGrass_RusCstSE_RFD_lo
biomassGrass_SabarmatiR_IRR_hi
biomassGrass_SabarmatiR_IRR_lo
biomassGrass_SabarmatiR_RFD_hi
biomassGrass_SabarmatiR_RFD_lo
biomassGrass_Salinas_IRR_hi
biomassGrass_Salinas_IRR_lo
biomassGrass_Salinas_RFD_hi
biomassGrass_Salinas_RFD_lo
biomassGrass_Salween_IRR_hi
biomassGrass_Salween_IRR_lo
biomassGrass_Salween_RFD_hi
biomassGrass_Salween_RFD_lo
biomassGrass_SAmerCstN_IRR_hi
biomassGrass_SAmerCstN_IRR_lo
biomassGrass_SAmerCstN_RFD_hi
biomassGrass_SAmerCstN_RFD_lo
biomassGrass_SAmerCstNE_IRR_hi
biomassGrass_SAmerCstNE_IRR_lo
biomassGrass_SAmerCstNE_RFD_hi
biomassGrass_SAmerCstNE_RFD_lo
biomassGrass_SaoFrancR_IRR_hi
biomassGrass_SaoFrancR_IRR_lo
biomassGrass_SaoFrancR_RFD_hi
biomassGrass_SaoFrancR_RFD_lo
biomassGrass_ScheldtR_IRR_hi
biomassGrass_ScheldtR_IRR_lo
biomassGrass_ScheldtR_RFD_hi
biomassGrass_ScheldtR_RFD_lo
biomassGrass_SChinaSea_IRR_hi
biomassGrass_SChinaSea_IRR_lo
biomassGrass_SChinaSea_RFD_hi
biomassGrass_SChinaSea_RFD_lo
biomassGrass_ScndnvN_IRR_hi
biomassGrass_ScndnvN_IRR_lo
biomassGrass_ScndnvN_RFD_hi
biomassGrass_ScndnvN_RFD_lo
biomassGrass_Scotland_IRR_hi
biomassGrass_Scotland_IRR_lo
biomassGrass_Scotland_RFD_hi
biomassGrass_Scotland_RFD_lo
biomassGrass_SeineR_IRR_hi
biomassGrass_SeineR_IRR_lo
biomassGrass_SeineR_RFD_hi
biomassGrass_SeineR_RFD_lo
biomassGrass_SenegalR_IRR_hi
biomassGrass_SenegalR_IRR_lo
biomassGrass_SenegalR_RFD_hi
biomassGrass_SenegalR_RFD_lo
biomassGrass_SepikR_RFD_hi
biomassGrass_SepikR_RFD_lo
biomassGrass_ShebJubR_IRR_hi
biomassGrass_ShebJubR_IRR_lo
biomassGrass_ShebJubR_RFD_hi
biomassGrass_ShebJubR_RFD_lo
biomassGrass_SiberiaW_IRR_hi
biomassGrass_SiberiaW_IRR_lo
biomassGrass_SiberiaW_RFD_hi
biomassGrass_SiberiaW_RFD_lo
biomassGrass_SinaiP_IRR_hi
biomassGrass_SinaiP_IRR_lo
biomassGrass_SinaiP_RFD_hi
biomassGrass_SinaiP_RFD_lo
biomassGrass_SittaungR_IRR_hi
biomassGrass_SittaungR_IRR_lo
biomassGrass_SittaungR_RFD_hi
biomassGrass_SittaungR_RFD_lo
biomassGrass_SpainCstSE_IRR_hi
biomassGrass_SpainCstSE_IRR_lo
biomassGrass_SpainCstSE_RFD_hi
biomassGrass_SpainCstSE_RFD_lo
biomassGrass_SriLanka_IRR_hi
biomassGrass_SriLanka_IRR_lo
biomassGrass_SriLanka_RFD_hi
biomassGrass_SriLanka_RFD_lo
biomassGrass_StLwrncR_IRR_hi
biomassGrass_StLwrncR_IRR_lo
biomassGrass_StLwrncR_RFD_hi
biomassGrass_StLwrncR_RFD_lo
biomassGrass_Sulawesi_IRR_hi
biomassGrass_Sulawesi_IRR_lo
biomassGrass_Sulawesi_RFD_hi
biomassGrass_Sulawesi_RFD_lo
biomassGrass_Sumatra_IRR_hi
biomassGrass_Sumatra_IRR_lo
biomassGrass_Sumatra_RFD_hi
biomassGrass_Sumatra_RFD_lo
biomassGrass_Sweden_IRR_hi

Deforest_MissppRN
Deforest_MissppRS
Deforest_MurrayDrlg
Deforest_NarvaR
Deforest_NegroR
Deforest_NelsonR
Deforest_NemanR
Deforest_NevaR
Deforest_NewCaledn
Deforest_NewZealand
Deforest_NigerR
Deforest_NileR
Deforest_NWTerr
Deforest_ObR
Deforest_OderR
Deforest_OhioR
Deforest_OrinocoR
Deforest_PacArctic
Deforest_Pampas
Deforest_Papaloapan
Deforest_PapuaCst
Deforest_ParnaibaR
Deforest_Patagonia
Deforest_PeruCst
Deforest_Phlppns
Deforest_PolandCst
Deforest_PoR
Deforest_RhineR
Deforest_RhoneR
Deforest_RiftValley
Deforest_RioBalsas
Deforest_RioGrande
Deforest_RioLaPlata
Deforest_RioLerma
Deforest_RioVerde
Deforest_RusCstSE
Deforest_Salinas
Deforest_Salween
Deforest_SAmerCstN
Deforest_SAmerCstNE
Deforest_SaoFrancR
Deforest_ScheldtR
Deforest_SChinaSea
Deforest_ScndnvN
Deforest_Scotland
Deforest_SeineR
Deforest_SenegalR
Deforest_SepikR
Deforest_SiberiaN
Deforest_SiberiaW
Deforest_SittaungR
Deforest_SolomonIsl
Deforest_SpainCstSE
Deforest_SriLanka
Deforest_StLwrncR
Deforest_Sulawesi
Deforest_Sumatra
Deforest_Sweden
Deforest_SyrDaryaR
Deforest_TagusR
Deforest_Taiwan
Deforest_Tasmania
Deforest_Tehuantpc
Deforest_TennR
Deforest_TexasCst
Deforest_ThaiGulf
Deforest_TiberR
Deforest_TigrEuphR
Deforest_TocantinsR
Deforest_UralR
Deforest_UsaColoRN
Deforest_UsaColoRS
Deforest_UsaCstE
Deforest_UsaCstNE
Deforest_UsaCstSE
Deforest_UsaPacNW
Deforest_VietnamCst
Deforest_VolgaR
Deforest_VoltaR
Deforest_WislaR
Deforest_XunJiang
Deforest_YeniseiR
Deforest_YucatanP
Deforest_ZambeziR
Domestic Aviation
Domestic Ship
EAF with DRI
EAF with scrap
electricity
electricity_net_ownuse
FiberCrop_AdrBlkSea
FiberCrop_AfrCstE
FiberCrop_AfrCstNE
FiberCrop_AfrCstNW
FiberCrop_AfrCstS
FiberCrop_AfrCstSE
biomassGrass_Sweden_IRR_lo
biomassGrass_Sweden_RFD_hi
biomassGrass_Sweden_RFD_lo
biomassGrass_SyrDaryaR_IRR_hi
biomassGrass_SyrDaryaR_IRR_lo
biomassGrass_SyrDaryaR_RFD_hi
biomassGrass_SyrDaryaR_RFD_lo
biomassGrass_TagusR_IRR_hi
biomassGrass_TagusR_IRR_lo
biomassGrass_TagusR_RFD_hi
biomassGrass_TagusR_RFD_lo
biomassGrass_Taiwan_IRR_hi
biomassGrass_Taiwan_IRR_lo
biomassGrass_Taiwan_RFD_hi
biomassGrass_Taiwan_RFD_lo
biomassGrass_TaptiR_IRR_hi
biomassGrass_TaptiR_IRR_lo
biomassGrass_TaptiR_RFD_hi
biomassGrass_TaptiR_RFD_lo
biomassGrass_Tarim_IRR_hi
biomassGrass_Tarim_IRR_lo
biomassGrass_Tarim_RFD_hi
biomassGrass_Tarim_RFD_lo
biomassGrass_Tasmania_IRR_hi
biomassGrass_Tasmania_IRR_lo
biomassGrass_Tasmania_RFD_hi
biomassGrass_Tasmania_RFD_lo
biomassGrass_Tehuantpc_IRR_hi
biomassGrass_Tehuantpc_IRR_lo
biomassGrass_Tehuantpc_RFD_hi
biomassGrass_Tehuantpc_RFD_lo
biomassGrass_TennR_IRR_hi
biomassGrass_TennR_IRR_lo
biomassGrass_TennR_RFD_hi
biomassGrass_TennR_RFD_lo
biomassGrass_TexasCst_IRR_hi
biomassGrass_TexasCst_IRR_lo
biomassGrass_TexasCst_RFD_hi
biomassGrass_TexasCst_RFD_lo
biomassGrass_ThaiGulf_IRR_hi
biomassGrass_ThaiGulf_IRR_lo
biomassGrass_ThaiGulf_RFD_hi
biomassGrass_ThaiGulf_RFD_lo
biomassGrass_TiberR_IRR_hi
biomassGrass_TiberR_IRR_lo
biomassGrass_TiberR_RFD_hi
biomassGrass_TiberR_RFD_lo
biomassGrass_TigrEuphR_IRR_hi
biomassGrass_TigrEuphR_IRR_lo
biomassGrass_TigrEuphR_RFD_hi
biomassGrass_TigrEuphR_RFD_lo
biomassGrass_TocantinsR_IRR_hi
biomassGrass_TocantinsR_IRR_lo
biomassGrass_TocantinsR_RFD_hi
biomassGrass_TocantinsR_RFD_lo
biomassGrass_UralR_IRR_hi
biomassGrass_UralR_IRR_lo
biomassGrass_UralR_RFD_hi
biomassGrass_UralR_RFD_lo
biomassGrass_UsaColoRN_IRR_hi
biomassGrass_UsaColoRN_IRR_lo
biomassGrass_UsaColoRN_RFD_hi
biomassGrass_UsaColoRN_RFD_lo
biomassGrass_UsaColoRS_IRR_hi
biomassGrass_UsaColoRS_IRR_lo
biomassGrass_UsaColoRS_RFD_hi
biomassGrass_UsaColoRS_RFD_lo
biomassGrass_UsaCstE_IRR_hi
biomassGrass_UsaCstE_IRR_lo
biomassGrass_UsaCstE_RFD_hi
biomassGrass_UsaCstE_RFD_lo
biomassGrass_UsaCstNE_IRR_hi
biomassGrass_UsaCstNE_IRR_lo
biomassGrass_UsaCstNE_RFD_hi
biomassGrass_UsaCstNE_RFD_lo
biomassGrass_UsaCstSE_IRR_hi
biomassGrass_UsaCstSE_IRR_lo
biomassGrass_UsaCstSE_RFD_hi
biomassGrass_UsaCstSE_RFD_lo
biomassGrass_UsaPacNW_IRR_hi
biomassGrass_UsaPacNW_IRR_lo
biomassGrass_UsaPacNW_RFD_hi
biomassGrass_UsaPacNW_RFD_lo
biomassGrass_VietnamCst_IRR_hi
biomassGrass_VietnamCst_IRR_lo
biomassGrass_VietnamCst_RFD_hi
biomassGrass_VietnamCst_RFD_lo
biomassGrass_VolgaR_IRR_hi
biomassGrass_VolgaR_IRR_lo
biomassGrass_VolgaR_RFD_hi
biomassGrass_VolgaR_RFD_lo
biomassGrass_VoltaR_IRR_hi
biomassGrass_VoltaR_IRR_lo
biomassGrass_VoltaR_RFD_hi
biomassGrass_VoltaR_RFD_lo
biomassGrass_WislaR_IRR_hi

FiberCrop_AfrCstSSW
FiberCrop_AfrCstW
FiberCrop_AfrIntN
FiberCrop_AfrIntS
FiberCrop_AmazonR
FiberCrop_AmuDaryaR
FiberCrop_AmurR
FiberCrop_AngolaCst
FiberCrop_ArabianP
FiberCrop_ArabianSea
FiberCrop_ArgColoR
FiberCrop_ArgCstN
FiberCrop_ArgCstS
FiberCrop_ArkWhtRedR
FiberCrop_AusCstE
FiberCrop_BalticSea
FiberCrop_BarentsSea
FiberCrop_BengalBay
FiberCrop_BengalW
FiberCrop_BlackSeaN
FiberCrop_BlackSeaS
FiberCrop_BoHai
FiberCrop_BorneoCstN
FiberCrop_BrahmaniR
FiberCrop_BrzCstE
FiberCrop_BrzCstN
FiberCrop_BrzCstS
FiberCrop_California
FiberCrop_CanAtl
FiberCrop_Caribbean
FiberCrop_CaspianE
FiberCrop_CaspianNE
FiberCrop_CaspianSW
FiberCrop_CauveryR
FiberCrop_ChaoPhrR
FiberCrop_ChileCstN
FiberCrop_ChileCstS
FiberCrop_ChinaCst
FiberCrop_CntAmer
FiberCrop_ColEcuaCst
FiberCrop_CongoR
FiberCrop_DanubeR
FiberCrop_DaugavaR
FiberCrop_DeadSea
FiberCrop_DnieperR
FiberCrop_DniesterR
FiberCrop_DonR
FiberCrop_DouroR
FiberCrop_DvinaRN
FiberCrop_EbroR
FiberCrop_EJrdnSyr
FiberCrop_ElbeR
FiberCrop_EmsWeserR
FiberCrop_EngWales
FiberCrop_FarahrudR
FiberCrop_Finland
FiberCrop_FlyR
FiberCrop_FranceCstS
FiberCrop_FranceCstW
FiberCrop_FraserR
FiberCrop_GangesR
FiberCrop_Gironde
FiberCrop_Gobi
FiberCrop_GodavariR
FiberCrop_GreatLakes
FiberCrop_GrijUsuR
FiberCrop_GuadalqR
FiberCrop_GuadianaR
FiberCrop_GuineaGulf
FiberCrop_Hainan
FiberCrop_HamuMashR
FiberCrop_Helmand
FiberCrop_Hong
FiberCrop_HuangHeR
FiberCrop_HudsonBay
FiberCrop_IberiaCst
FiberCrop_IdnE
FiberCrop_IndCstE
FiberCrop_IndCstNE
FiberCrop_IndCstS
FiberCrop_IndCstW
FiberCrop_IndusR
FiberCrop_Iran
FiberCrop_Ireland
FiberCrop_IrianJaya
FiberCrop_IrrawaddyR
FiberCrop_ItalyCstE
FiberCrop_ItalyCstW
FiberCrop_Japan
FiberCrop_JavaTimor
FiberCrop_Kalimantan
FiberCrop_Korea
FiberCrop_KrishnaR
FiberCrop_LaPuna
FiberCrop_LBalkash
FiberCrop_LChad

biomassGrass_WislaR_IRR_lo
biomassGrass_WislaR_RFD_hi
biomassGrass_WislaR_RFD_lo
biomassGrass_XunJiang_IRR_hi
biomassGrass_XunJiang_IRR_lo
biomassGrass_XunJiang_RFD_hi
biomassGrass_XunJiang_RFD_lo
biomassGrass_Yangtze_IRR_hi
biomassGrass_Yangtze_IRR_lo
biomassGrass_Yangtze_RFD_hi
biomassGrass_Yangtze_RFD_lo
biomassGrass_YeniseiR_IRR_hi
biomassGrass_YeniseiR_IRR_lo
biomassGrass_YeniseiR_RFD_hi
biomassGrass_YeniseiR_RFD_lo
biomassGrass_YucatanP_IRR_hi
biomassGrass_YucatanP_IRR_lo
biomassGrass_YucatanP_RFD_hi
biomassGrass_YucatanP_RFD_lo
biomassGrass_ZambeziR_IRR_hi
biomassGrass_ZambeziR_IRR_lo
biomassGrass_ZambeziR_RFD_hi
biomassGrass_ZambeziR_RFD_lo
biomassGrass_ZiyaHe_IRR_hi
biomassGrass_ZiyaHe_IRR_lo
biomassGrass_ZiyaHe_RFD_hi
biomassGrass_ZiyaHe_RFD_lo
biomassTree_AdrBlkSea_IRR_hi
biomassTree_AdrBlkSea_IRR_lo
biomassTree_AdrBlkSea_RFD_hi
biomassTree_AdrBlkSea_RFD_lo
biomassTree_AfrCstE_IRR_hi
biomassTree_AfrCstE_IRR_lo
biomassTree_AfrCstE_RFD_hi
biomassTree_AfrCstE_RFD_lo
biomassTree_AfrCstNE_IRR_hi
biomassTree_AfrCstNE_IRR_lo
biomassTree_AfrCstNE_RFD_hi
biomassTree_AfrCstNE_RFD_lo
biomassTree_AfrCstNW_IRR_hi
biomassTree_AfrCstNW_IRR_lo
biomassTree_AfrCstNW_RFD_hi
biomassTree_AfrCstNW_RFD_lo
biomassTree_AfrCstS_IRR_hi
biomassTree_AfrCstS_IRR_lo
biomassTree_AfrCstS_RFD_hi
biomassTree_AfrCstS_RFD_lo
biomassTree_AfrCstSE_IRR_hi
biomassTree_AfrCstSE_IRR_lo
biomassTree_AfrCstSE_RFD_hi
biomassTree_AfrCstSE_RFD_lo
biomassTree_AfrCstSSW_IRR_hi
biomassTree_AfrCstSSW_IRR_lo
biomassTree_AfrCstSSW_RFD_hi
biomassTree_AfrCstSSW_RFD_lo
biomassTree_AfrCstW_IRR_hi
biomassTree_AfrCstW_IRR_lo
biomassTree_AfrCstW_RFD_hi
biomassTree_AfrCstW_RFD_lo
biomassTree_AfrIntN_IRR_hi
biomassTree_AfrIntN_IRR_lo
biomassTree_AfrIntN_RFD_hi
biomassTree_AfrIntN_RFD_lo
biomassTree_AfrIntS_IRR_hi
biomassTree_AfrIntS_IRR_lo
biomassTree_AfrIntS_RFD_hi
biomassTree_AfrIntS_RFD_lo
biomassTree_AmazonR_IRR_hi
biomassTree_AmazonR_IRR_lo
biomassTree_AmazonR_RFD_hi
biomassTree_AmazonR_RFD_lo
biomassTree_AmuDaryaR_IRR_hi
biomassTree_AmuDaryaR_IRR_lo
biomassTree_AmuDaryaR_RFD_hi
biomassTree_AmuDaryaR_RFD_lo
biomassTree_AmurR_IRR_hi
biomassTree_AmurR_IRR_lo
biomassTree_AmurR_RFD_hi
biomassTree_AmurR_RFD_lo
biomassTree_AngolaCst_IRR_hi
biomassTree_AngolaCst_IRR_lo
biomassTree_AngolaCst_RFD_hi
biomassTree_AngolaCst_RFD_lo
biomassTree_ArgColoR_IRR_hi
biomassTree_ArgColoR_IRR_lo
biomassTree_ArgColoR_RFD_hi
biomassTree_ArgColoR_RFD_lo
biomassTree_ArgCstS_IRR_hi
biomassTree_ArgCstS_IRR_lo
biomassTree_ArgCstS_RFD_hi
biomassTree_ArgCstS_RFD_lo
biomassTree_ArkWhtRedR_IRR_hi
biomassTree_ArkWhtRedR_IRR_lo
biomassTree_ArkWhtRedR_RFD_hi
biomassTree_ArkWhtRedR_RFD_lo
biomassTree_AusCstE_IRR_hi

FiberCrop_LenaR
FiberCrop_LimpopoR
FiberCrop_LoireR
FiberCrop_Mackenzie
FiberCrop_Madagascar
FiberCrop_MagdalenaR
FiberCrop_MahanadiR
FiberCrop_MahiR
FiberCrop_MalaysiaP
FiberCrop_MarChiq
FiberCrop_MeditE
FiberCrop_MeditIsl
FiberCrop_MeditS
FiberCrop_Mekong
FiberCrop_MexBaja
FiberCrop_MexCstNW
FiberCrop_MexCstW
FiberCrop_MexGulf
FiberCrop_MexInt
FiberCrop_MissouriR
FiberCrop_MissppRN
FiberCrop_MissppRS
FiberCrop_MurrayDrlg
FiberCrop_NarmadaR
FiberCrop_NarvaR
FiberCrop_NegroR
FiberCrop_NelsonR
FiberCrop_NemanR
FiberCrop_NevaR
FiberCrop_NewZealand
FiberCrop_NigerR
FiberCrop_NileR
FiberCrop_NWTerr
FiberCrop_ObR
FiberCrop_OderR
FiberCrop_OhioR
FiberCrop_OrangeR
FiberCrop_OrinocoR
FiberCrop_PacArctic
FiberCrop_Pampas
FiberCrop_Papaloapan
FiberCrop_ParnaibaR
FiberCrop_PennarR
FiberCrop_PersianGulf
FiberCrop_PeruCst
FiberCrop_Phlppns
FiberCrop_PolandCst
FiberCrop_PoR
FiberCrop_RedSeaE
FiberCrop_RhineR
FiberCrop_RhoneR
FiberCrop_RiftValley
FiberCrop_RioBalsas
FiberCrop_RioGrande
FiberCrop_RioLaPlata
FiberCrop_RioLerma
FiberCrop_RioVerde
FiberCrop_RusCstSE
FiberCrop_SabarmatiR
FiberCrop_Salinas
FiberCrop_Salween
FiberCrop_SAmerCstN
FiberCrop_SAmerCstNE
FiberCrop_SaoFrancR
FiberCrop_ScheldtR
FiberCrop_SChinaSea
FiberCrop_Scotland
FiberCrop_SeineR
FiberCrop_SenegalR
FiberCrop_SepikR
FiberCrop_ShebJubR
FiberCrop_SiberiaW
FiberCrop_SinaiP
FiberCrop_SittaungR
FiberCrop_SpainCstSE
FiberCrop_StLwrncR
FiberCrop_Sulawesi
FiberCrop_Sumatra
FiberCrop_SyrDaryaR
FiberCrop_TagusR
FiberCrop_Taiwan
FiberCrop_TaptiR
FiberCrop_Tarim
FiberCrop_Tehuantpc
FiberCrop_TennR
FiberCrop_TexasCst
FiberCrop_ThaiGulf
FiberCrop_TiberR
FiberCrop_TigrEuphR
FiberCrop_TocantinsR
FiberCrop_UralR
FiberCrop_UsaColoRS
FiberCrop_UsaCstE
FiberCrop_UsaCstNE
FiberCrop_UsaCstSE
FiberCrop_UsaPacNW

biomassTree_AusCstE_IRR_lo
biomassTree_AusCstE_RFD_hi
biomassTree_AusCstE_RFD_lo
biomassTree_AusCstN_IRR_hi
biomassTree_AusCstN_IRR_lo
biomassTree_AusCstN_RFD_hi
biomassTree_AusCstN_RFD_lo
biomassTree_AusCstS_IRR_hi
biomassTree_AusCstS_IRR_lo
biomassTree_AusCstS_RFD_hi
biomassTree_AusCstS_RFD_lo
biomassTree_AusCstW_IRR_hi
biomassTree_AusCstW_IRR_lo
biomassTree_AusCstW_RFD_hi
biomassTree_AusCstW_RFD_lo
biomassTree_BalticSea_IRR_hi
biomassTree_BalticSea_IRR_lo
biomassTree_BalticSea_RFD_hi
biomassTree_BalticSea_RFD_lo
biomassTree_BarentsSea_IRR_hi
biomassTree_BarentsSea_IRR_lo
biomassTree_BarentsSea_RFD_hi
biomassTree_BarentsSea_RFD_lo
biomassTree_BengalBay_IRR_hi
biomassTree_BengalBay_IRR_lo
biomassTree_BengalBay_RFD_hi
biomassTree_BengalBay_RFD_lo
biomassTree_BengalW_IRR_hi
biomassTree_BengalW_IRR_lo
biomassTree_BengalW_RFD_hi
biomassTree_BengalW_RFD_lo
biomassTree_BlackSeaN_IRR_hi
biomassTree_BlackSeaN_IRR_lo
biomassTree_BlackSeaN_RFD_hi
biomassTree_BlackSeaN_RFD_lo
biomassTree_BlackSeaS_IRR_hi
biomassTree_BlackSeaS_IRR_lo
biomassTree_BlackSeaS_RFD_hi
biomassTree_BlackSeaS_RFD_lo
biomassTree_BoHai_IRR_hi
biomassTree_BoHai_IRR_lo
biomassTree_BoHai_RFD_hi
biomassTree_BoHai_RFD_lo
biomassTree_BorneoCstN_IRR_hi
biomassTree_BorneoCstN_IRR_lo
biomassTree_BorneoCstN_RFD_hi
biomassTree_BorneoCstN_RFD_lo
biomassTree_BrahmaniR_IRR_hi
biomassTree_BrahmaniR_IRR_lo
biomassTree_BrahmaniR_RFD_hi
biomassTree_BrahmaniR_RFD_lo
biomassTree_BrzCstE_IRR_hi
biomassTree_BrzCstE_IRR_lo
biomassTree_BrzCstE_RFD_hi
biomassTree_BrzCstE_RFD_lo
biomassTree_BrzCstN_IRR_hi
biomassTree_BrzCstN_IRR_lo
biomassTree_BrzCstN_RFD_hi
biomassTree_BrzCstN_RFD_lo
biomassTree_BrzCstS_IRR_hi
biomassTree_BrzCstS_IRR_lo
biomassTree_BrzCstS_RFD_hi
biomassTree_BrzCstS_RFD_lo
biomassTree_California_IRR_hi
biomassTree_California_IRR_lo
biomassTree_California_RFD_hi
biomassTree_California_RFD_lo
biomassTree_CanAtl_IRR_hi
biomassTree_CanAtl_IRR_lo
biomassTree_CanAtl_RFD_hi
biomassTree_CanAtl_RFD_lo
biomassTree_Caribbean_IRR_hi
biomassTree_Caribbean_IRR_lo
biomassTree_Caribbean_RFD_hi
biomassTree_Caribbean_RFD_lo
biomassTree_CaspianE_IRR_hi
biomassTree_CaspianE_IRR_lo
biomassTree_CaspianE_RFD_hi
biomassTree_CaspianE_RFD_lo
biomassTree_CaspianNE_IRR_hi
biomassTree_CaspianNE_IRR_lo
biomassTree_CaspianNE_RFD_hi
biomassTree_CaspianNE_RFD_lo
biomassTree_CaspianSW_IRR_hi
biomassTree_CaspianSW_IRR_lo
biomassTree_CaspianSW_RFD_hi
biomassTree_CaspianSW_RFD_lo
biomassTree_CauveryR_IRR_hi
biomassTree_CauveryR_IRR_lo
biomassTree_CauveryR_RFD_hi
biomassTree_CauveryR_RFD_lo
biomassTree_ChaoPhrR_IRR_hi
biomassTree_ChaoPhrR_IRR_lo
biomassTree_ChaoPhrR_RFD_hi
biomassTree_ChaoPhrR_RFD_lo
biomassTree_ChileCstN_IRR_hi

FiberCrop_VietnamCst
FiberCrop_VolgaR
FiberCrop_VoltaR
FiberCrop_WislaR
FiberCrop_XunJiang
FiberCrop_Yangtze
FiberCrop_YeniseiR
FiberCrop_YucatanP
FiberCrop_ZambeziR
FiberCrop_ZiyaHe
fire_exting
foams
FodderGrass_AdrBlkSea
FodderGrass_AfrCstNE
FodderGrass_AfrCstNW
FodderGrass_AfrIntN
FodderGrass_AmazonR
FodderGrass_AmuDaryaR
FodderGrass_AmurR
FodderGrass_ArabianP
FodderGrass_ArabianSea
FodderGrass_ArgColoR
FodderGrass_ArgCstN
FodderGrass_ArgCstS
FodderGrass_ArkWhtRedR
FodderGrass_AusCstE
FodderGrass_AusCstN
FodderGrass_AusCstS
FodderGrass_AusCstW
FodderGrass_AusInt
FodderGrass_BalticSea
FodderGrass_BarentsSea
FodderGrass_BengalBay
FodderGrass_BengalW
FodderGrass_BlackSeaN
FodderGrass_BlackSeaS
FodderGrass_BoHai
FodderGrass_BrahmaniR
FodderGrass_California
FodderGrass_CaspianE
FodderGrass_CaspianNE
FodderGrass_CaspianSW
FodderGrass_CauveryR
FodderGrass_ChaoPhrR
FodderGrass_ChileCstN
FodderGrass_ChileCstS
FodderGrass_ChinaCst
FodderGrass_CntAmer
FodderGrass_ColEcuaCst
FodderGrass_CongoR
FodderGrass_DanubeR
FodderGrass_DaugavaR
FodderGrass_DeadSea
FodderGrass_DnieperR
FodderGrass_DniesterR
FodderGrass_DnkGrmCst
FodderGrass_DonR
FodderGrass_DouroR
FodderGrass_DvinaRN
FodderGrass_EbroR
FodderGrass_EJrdnSyr
FodderGrass_ElbeR
FodderGrass_EmsWeserR
FodderGrass_FarahrudR
FodderGrass_Finland
FodderGrass_FranceCstS
FodderGrass_FranceCstW
FodderGrass_FraserR
FodderGrass_GangesR
FodderGrass_Gironde
FodderGrass_Gobi
FodderGrass_GodavariR
FodderGrass_GreatBasin
FodderGrass_GreatLakes
FodderGrass_GrijUsuR
FodderGrass_GuadalqR
FodderGrass_GuadianaR
FodderGrass_Hainan
FodderGrass_HamuMashR
FodderGrass_Helmand
FodderGrass_Hong
FodderGrass_HuangHeR
FodderGrass_IberiaCst
FodderGrass_IndCstE
FodderGrass_IndCstNE
FodderGrass_IndCstS
FodderGrass_IndCstW
FodderGrass_IndusR
FodderGrass_Iran
FodderGrass_IrrawaddyR
FodderGrass_ItalyCstE
FodderGrass_ItalyCstW
FodderGrass_Japan
FodderGrass_Korea
FodderGrass_KrishnaR
FodderGrass_LaPuna
biomassTree_ChileCstN_IRR_lo
biomassTree_ChileCstN_RFD_hi
biomassTree_ChileCstN_RFD_lo
biomassTree_ChileCstS_IRR_hi
biomassTree_ChileCstS_IRR_lo
biomassTree_ChileCstS_RFD_hi
biomassTree_ChileCstS_RFD_lo
biomassTree_ChinaCst_IRR_hi
biomassTree_ChinaCst_IRR_lo
biomassTree_ChinaCst_RFD_hi
biomassTree_ChinaCst_RFD_lo
biomassTree_ChurchillR_RFD_hi
biomassTree_ChurchillR_RFD_lo
biomassTree_CntAmer_IRR_hi
biomassTree_CntAmer_IRR_lo
biomassTree_CntAmer_RFD_hi
biomassTree_CntAmer_RFD_lo
biomassTree_ColEcuaCst_IRR_hi
biomassTree_ColEcuaCst_IRR_lo
biomassTree_ColEcuaCst_RFD_hi
biomassTree_ColEcuaCst_RFD_lo
biomassTree_CongoR_IRR_hi
biomassTree_CongoR_IRR_lo
biomassTree_CongoR_RFD_hi
biomassTree_CongoR_RFD_lo
biomassTree_DanubeR_IRR_hi
biomassTree_DanubeR_IRR_lo
biomassTree_DanubeR_RFD_hi
biomassTree_DanubeR_RFD_lo
biomassTree_DaugavaR_IRR_hi
biomassTree_DaugavaR_IRR_lo
biomassTree_DaugavaR_RFD_hi
biomassTree_DaugavaR_RFD_lo
biomassTree_DnieperR_IRR_hi
biomassTree_DnieperR_IRR_lo
biomassTree_DnieperR_RFD_hi
biomassTree_DnieperR_RFD_lo
biomassTree_DniesterR_IRR_hi
biomassTree_DniesterR_IRR_lo
biomassTree_DniesterR_RFD_hi
biomassTree_DniesterR_RFD_lo
biomassTree_DnkGrmCst_IRR_hi
biomassTree_DnkGrmCst_IRR_lo
biomassTree_DnkGrmCst_RFD_hi
biomassTree_DnkGrmCst_RFD_lo
biomassTree_DonR_IRR_hi
biomassTree_DonR_IRR_lo
biomassTree_DonR_RFD_hi
biomassTree_DonR_RFD_lo
biomassTree_DouroR_IRR_hi
biomassTree_DouroR_IRR_lo
biomassTree_DouroR_RFD_hi
biomassTree_DouroR_RFD_lo
biomassTree_DvinaRN_IRR_hi
biomassTree_DvinaRN_IRR_lo
biomassTree_DvinaRN_RFD_hi
biomassTree_DvinaRN_RFD_lo
biomassTree_EbroR_IRR_hi
biomassTree_EbroR_IRR_lo
biomassTree_EbroR_RFD_hi
biomassTree_EbroR_RFD_lo
biomassTree_ElbeR_IRR_hi
biomassTree_ElbeR_IRR_lo
biomassTree_ElbeR_RFD_hi
biomassTree_ElbeR_RFD_lo
biomassTree_EmsWeserR_IRR_hi
biomassTree_EmsWeserR_IRR_lo
biomassTree_EmsWeserR_RFD_hi
biomassTree_EmsWeserR_RFD_lo
biomassTree_EngWales_IRR_hi
biomassTree_EngWales_IRR_lo
biomassTree_EngWales_RFD_hi
biomassTree_EngWales_RFD_lo
biomassTree_Finland_IRR_hi
biomassTree_Finland_IRR_lo
biomassTree_Finland_RFD_hi
biomassTree_Finland_RFD_lo
biomassTree_FlyR_RFD_hi
biomassTree_FlyR_RFD_lo
biomassTree_FranceCstS_IRR_hi
biomassTree_FranceCstS_IRR_lo
biomassTree_FranceCstS_RFD_hi
biomassTree_FranceCstS_RFD_lo
biomassTree_FranceCstW_IRR_hi
biomassTree_FranceCstW_IRR_lo
biomassTree_FranceCstW_RFD_hi
biomassTree_FranceCstW_RFD_lo
biomassTree_FraserR_IRR_hi
biomassTree_FraserR_IRR_lo
biomassTree_FraserR_RFD_hi
biomassTree_FraserR_RFD_lo
biomassTree_GangesR_IRR_hi
biomassTree_GangesR_IRR_lo
biomassTree_GangesR_RFD_hi
biomassTree_GangesR_RFD_lo
biomassTree_Gironde_IRR_hi

FodderGrass_LBalkash
FodderGrass_LChad
FodderGrass_LenaR
FodderGrass_LoireR
FodderGrass_MahanadiR
FodderGrass_MahiR
FodderGrass_MalaysiaP
FodderGrass_MarChiq
FodderGrass_MeditE
FodderGrass_MeditIsl
FodderGrass_MeditS
FodderGrass_Mekong
FodderGrass_MexBaja
FodderGrass_MexCstNW
FodderGrass_MexCstW
FodderGrass_MexGulf
FodderGrass_MexInt
FodderGrass_MissouriR
FodderGrass_MissppRN
FodderGrass_MissppRS
FodderGrass_MurrayDrlg
FodderGrass_NarmadaR
FodderGrass_NarvaR
FodderGrass_NegroR
FodderGrass_NelsonR
FodderGrass_NemanR
FodderGrass_NevaR
FodderGrass_NewZealand
FodderGrass_NileR
FodderGrass_ObR
FodderGrass_OderR
FodderGrass_OhioR
FodderGrass_Pampas
FodderGrass_Papaloapan
FodderGrass_Patagonia
FodderGrass_PennarR
FodderGrass_PersianGulf
FodderGrass_PeruCst
FodderGrass_Phlppns
FodderGrass_PolandCst
FodderGrass_PoR
FodderGrass_RedSeaE
FodderGrass_RhineR
FodderGrass_RhoneR
FodderGrass_RiftValley
FodderGrass_RioBalsas
FodderGrass_RioGrande
FodderGrass_RioLaPlata
FodderGrass_RioLerma
FodderGrass_RioVerde
FodderGrass_RusCstSE
FodderGrass_SabarmatiR
FodderGrass_Salinas
FodderGrass_Salween
FodderGrass_ScheldtR
FodderGrass_SChinaSea
FodderGrass_ScndnvN
FodderGrass_SeineR
FodderGrass_SiberiaW
FodderGrass_SinaiP
FodderGrass_SittaungR
FodderGrass_SpainCstSE
FodderGrass_Sweden
FodderGrass_SyrDaryaR
FodderGrass_TagusR
FodderGrass_Taiwan
FodderGrass_TaptiR
FodderGrass_Tarim
FodderGrass_Tasmania
FodderGrass_Tehuantpc
FodderGrass_TennR
FodderGrass_TexasCst
FodderGrass_ThaiGulf
FodderGrass_TiberR
FodderGrass_TigrEuphR
FodderGrass_UralR
FodderGrass_UsaColoRN
FodderGrass_UsaColoRS
FodderGrass_UsaCstE
FodderGrass_UsaCstNE
FodderGrass_UsaCstSE
FodderGrass_UsaPacNW
FodderGrass_VolgaR
FodderGrass_WislaR
FodderGrass_XunJiang
FodderGrass_Yangtze
FodderGrass_YeniseiR
FodderGrass_YucatanP
FodderGrass_ZiyaHe
FodderHerb_AdrBlkSea
FodderHerb_AfrCstNE
FodderHerb_AfrCstNW
FodderHerb_AfrCstS
FodderHerb_AfrCstSSW
FodderHerb_AfrIntN
FodderHerb_AmazonR
biomassTree_Gironde_IRR_lo
biomassTree_Gironde_RFD_hi
biomassTree_Gironde_RFD_lo
biomassTree_Gobi_IRR_hi
biomassTree_Gobi_IRR_lo
biomassTree_Gobi_RFD_hi
biomassTree_Gobi_RFD_lo
biomassTree_GodavariR_IRR_hi
biomassTree_GodavariR_IRR_lo
biomassTree_GodavariR_RFD_hi
biomassTree_GodavariR_RFD_lo
biomassTree_GreatBasin_IRR_hi
biomassTree_GreatBasin_IRR_lo
biomassTree_GreatBasin_RFD_hi
biomassTree_GreatBasin_RFD_lo
biomassTree_GreatLakes_IRR_hi
biomassTree_GreatLakes_IRR_lo
biomassTree_GreatLakes_RFD_hi
biomassTree_GreatLakes_RFD_lo
biomassTree_GrijUsuR_IRR_hi
biomassTree_GrijUsuR_IRR_lo
biomassTree_GrijUsuR_RFD_hi
biomassTree_GrijUsuR_RFD_lo
biomassTree_GuadalqR_IRR_hi
biomassTree_GuadalqR_IRR_lo
biomassTree_GuadalqR_RFD_hi
biomassTree_GuadalqR_RFD_lo
biomassTree_GuadianaR_IRR_hi
biomassTree_GuadianaR_IRR_lo
biomassTree_GuadianaR_RFD_hi
biomassTree_GuadianaR_RFD_lo
biomassTree_GuineaGulf_IRR_hi
biomassTree_GuineaGulf_IRR_lo
biomassTree_GuineaGulf_RFD_hi
biomassTree_GuineaGulf_RFD_lo
biomassTree_Hainan_IRR_hi
biomassTree_Hainan_IRR_lo
biomassTree_Hainan_RFD_hi
biomassTree_Hainan_RFD_lo
biomassTree_Hong_IRR_hi
biomassTree_Hong_IRR_lo
biomassTree_Hong_RFD_hi
biomassTree_Hong_RFD_lo
biomassTree_HuangHeR_IRR_hi
biomassTree_HuangHeR_IRR_lo
biomassTree_HuangHeR_RFD_hi
biomassTree_HuangHeR_RFD_lo
biomassTree_HudsonBay_IRR_hi
biomassTree_HudsonBay_IRR_lo
biomassTree_HudsonBay_RFD_hi
biomassTree_HudsonBay_RFD_lo
biomassTree_IberiaCst_IRR_hi
biomassTree_IberiaCst_IRR_lo
biomassTree_IberiaCst_RFD_hi
biomassTree_IberiaCst_RFD_lo
biomassTree_Iceland_RFD_hi
biomassTree_Iceland_RFD_lo
biomassTree_IdnE_IRR_hi
biomassTree_IdnE_IRR_lo
biomassTree_IdnE_RFD_hi
biomassTree_IdnE_RFD_lo
biomassTree_IndCstE_IRR_hi
biomassTree_IndCstE_IRR_lo
biomassTree_IndCstE_RFD_hi
biomassTree_IndCstE_RFD_lo
biomassTree_IndCstNE_IRR_hi
biomassTree_IndCstNE_IRR_lo
biomassTree_IndCstNE_RFD_hi
biomassTree_IndCstNE_RFD_lo
biomassTree_IndCstS_IRR_hi
biomassTree_IndCstS_IRR_lo
biomassTree_IndCstS_RFD_hi
biomassTree_IndCstS_RFD_lo
biomassTree_IndCstW_IRR_hi
biomassTree_IndCstW_IRR_lo
biomassTree_IndCstW_RFD_hi
biomassTree_IndCstW_RFD_lo
biomassTree_IndusR_IRR_hi
biomassTree_IndusR_IRR_lo
biomassTree_IndusR_RFD_hi
biomassTree_IndusR_RFD_lo
biomassTree_Ireland_IRR_hi
biomassTree_Ireland_IRR_lo
biomassTree_Ireland_RFD_hi
biomassTree_Ireland_RFD_lo
biomassTree_IrianJaya_IRR_hi
biomassTree_IrianJaya_IRR_lo
biomassTree_IrianJaya_RFD_hi
biomassTree_IrianJaya_RFD_lo
biomassTree_IrrawaddyR_IRR_hi
biomassTree_IrrawaddyR_IRR_lo
biomassTree_IrrawaddyR_RFD_hi
biomassTree_IrrawaddyR_RFD_lo
biomassTree_ItalyCstE_IRR_hi
biomassTree_ItalyCstE_IRR_lo
biomassTree_ItalyCstE_RFD_hi

FodderHerb_AmuDaryaR
FodderHerb_AmurR
FodderHerb_ArabianP
FodderHerb_ArabianSea
FodderHerb_ArgColoR
FodderHerb_ArgCstN
FodderHerb_ArgCstS
FodderHerb_ArkWhtRedR
FodderHerb_AusCstE
FodderHerb_AusCstN
FodderHerb_AusCstS
FodderHerb_AusCstW
FodderHerb_AusInt
FodderHerb_BalticSea
FodderHerb_BarentsSea
FodderHerb_BlackSeaN
FodderHerb_BlackSeaS
FodderHerb_California
FodderHerb_CaspianE
FodderHerb_CaspianNE
FodderHerb_CaspianSW
FodderHerb_ChileCstN
FodderHerb_ChileCstS
FodderHerb_CntAmer
FodderHerb_ColEcuaCst
FodderHerb_DanubeR
FodderHerb_DaugavaR
FodderHerb_DeadSea
FodderHerb_DnieperR
FodderHerb_DniesterR
FodderHerb_DnkGrmCst
FodderHerb_DonR
FodderHerb_DouroR
FodderHerb_DvinaRN
FodderHerb_EbroR
FodderHerb_EJrdnSyr
FodderHerb_ElbeR
FodderHerb_EmsWeserR
FodderHerb_EngWales
FodderHerb_FarahrudR
FodderHerb_Finland
FodderHerb_FranceCstS
FodderHerb_FranceCstW
FodderHerb_FraserR
FodderHerb_Gironde
FodderHerb_Gobi
FodderHerb_GreatBasin
FodderHerb_GreatLakes
FodderHerb_GrijUsuR
FodderHerb_GuadalqR
FodderHerb_GuadianaR
FodderHerb_HamuMashR
FodderHerb_Helmand
FodderHerb_Hong
FodderHerb_IberiaCst
FodderHerb_Iran
FodderHerb_Ireland
FodderHerb_ItalyCstE
FodderHerb_ItalyCstW
FodderHerb_Japan
FodderHerb_LaPuna
FodderHerb_LBalkash
FodderHerb_LenaR
FodderHerb_LimpopoR
FodderHerb_LoireR
FodderHerb_MarChiq
FodderHerb_MeditE
FodderHerb_MeditIsl
FodderHerb_MeditS
FodderHerb_Mekong
FodderHerb_MexBaja
FodderHerb_MexCstNW
FodderHerb_MexCstW
FodderHerb_MexGulf
FodderHerb_MexInt
FodderHerb_MissouriR
FodderHerb_MissppRN
FodderHerb_MissppRS
FodderHerb_MurrayDrlg
FodderHerb_NarvaR
FodderHerb_NegroR
FodderHerb_NelsonR
FodderHerb_NemanR
FodderHerb_NevaR
FodderHerb_NewZealand
FodderHerb_NileR
FodderHerb_ObR
FodderHerb_OderR
FodderHerb_OhioR
FodderHerb_OrangeR
FodderHerb_Pampas
FodderHerb_Papaloapan
FodderHerb_Patagonia
FodderHerb_PersianGulf
FodderHerb_PeruCst
FodderHerb_PolandCst
biomassTree_ItalyCstE_RFD_lo
biomassTree_ItalyCstW_IRR_hi
biomassTree_ItalyCstW_IRR_lo
biomassTree_ItalyCstW_RFD_hi
biomassTree_ItalyCstW_RFD_lo
biomassTree_Japan_IRR_hi
biomassTree_Japan_IRR_lo
biomassTree_Japan_RFD_hi
biomassTree_Japan_RFD_lo
biomassTree_JavaTimor_IRR_hi
biomassTree_JavaTimor_IRR_lo
biomassTree_JavaTimor_RFD_hi
biomassTree_JavaTimor_RFD_lo
biomassTree_Kalimantan_IRR_hi
biomassTree_Kalimantan_IRR_lo
biomassTree_Kalimantan_RFD_hi
biomassTree_Kalimantan_RFD_lo
biomassTree_KaraSea_RFD_hi
biomassTree_KaraSea_RFD_lo
biomassTree_Korea_IRR_hi
biomassTree_Korea_IRR_lo
biomassTree_Korea_RFD_hi
biomassTree_Korea_RFD_lo
biomassTree_KrishnaR_IRR_hi
biomassTree_KrishnaR_IRR_lo
biomassTree_KrishnaR_RFD_hi
biomassTree_KrishnaR_RFD_lo
biomassTree_LaPuna_IRR_hi
biomassTree_LaPuna_IRR_lo
biomassTree_LaPuna_RFD_hi
biomassTree_LaPuna_RFD_lo
biomassTree_LBalkash_IRR_hi
biomassTree_LBalkash_IRR_lo
biomassTree_LBalkash_RFD_hi
biomassTree_LBalkash_RFD_lo
biomassTree_LChad_IRR_hi
biomassTree_LChad_IRR_lo
biomassTree_LChad_RFD_hi
biomassTree_LChad_RFD_lo
biomassTree_LenaR_IRR_hi
biomassTree_LenaR_IRR_lo
biomassTree_LenaR_RFD_hi
biomassTree_LenaR_RFD_lo
biomassTree_LimpopoR_IRR_hi
biomassTree_LimpopoR_IRR_lo
biomassTree_LimpopoR_RFD_hi
biomassTree_LimpopoR_RFD_lo
biomassTree_LoireR_IRR_hi
biomassTree_LoireR_IRR_lo
biomassTree_LoireR_RFD_hi
biomassTree_LoireR_RFD_lo
biomassTree_Mackenzie_IRR_hi
biomassTree_Mackenzie_IRR_lo
biomassTree_Mackenzie_RFD_hi
biomassTree_Mackenzie_RFD_lo
biomassTree_Madagascar_IRR_hi
biomassTree_Madagascar_IRR_lo
biomassTree_Madagascar_RFD_hi
biomassTree_Madagascar_RFD_lo
biomassTree_MagdalenaR_IRR_hi
biomassTree_MagdalenaR_IRR_lo
biomassTree_MagdalenaR_RFD_hi
biomassTree_MagdalenaR_RFD_lo
biomassTree_MahanadiR_IRR_hi
biomassTree_MahanadiR_IRR_lo
biomassTree_MahanadiR_RFD_hi
biomassTree_MahanadiR_RFD_lo
biomassTree_MahiR_IRR_hi
biomassTree_MahiR_IRR_lo
biomassTree_MahiR_RFD_hi
biomassTree_MahiR_RFD_lo
biomassTree_MalaysiaP_IRR_hi
biomassTree_MalaysiaP_IRR_lo
biomassTree_MalaysiaP_RFD_hi
biomassTree_MalaysiaP_RFD_lo
biomassTree_MarChiq_IRR_hi
biomassTree_MarChiq_IRR_lo
biomassTree_MarChiq_RFD_hi
biomassTree_MarChiq_RFD_lo
biomassTree_MeditE_IRR_hi
biomassTree_MeditE_IRR_lo
biomassTree_MeditE_RFD_hi
biomassTree_MeditE_RFD_lo
biomassTree_MeditIsl_IRR_hi
biomassTree_MeditIsl_IRR_lo
biomassTree_MeditIsl_RFD_hi
biomassTree_MeditIsl_RFD_lo
biomassTree_MeditS_IRR_hi
biomassTree_MeditS_IRR_lo
biomassTree_MeditS_RFD_hi
biomassTree_MeditS_RFD_lo
biomassTree_Mekong_IRR_hi
biomassTree_Mekong_IRR_lo
biomassTree_Mekong_RFD_hi
biomassTree_Mekong_RFD_lo
biomassTree_MexBaja_IRR_hi

FodderHerb_PoR
FodderHerb_RedSeaE
FodderHerb_RhineR
FodderHerb_RhoneR
FodderHerb_RiftValley
FodderHerb_RioBalsas
FodderHerb_RioGrande
FodderHerb_RioLaPlata
FodderHerb_RioLerma
FodderHerb_RioVerde
FodderHerb_RusCstSE
FodderHerb_Salinas
FodderHerb_ScheldtR
FodderHerb_SChinaSea
FodderHerb_ScndnvN
FodderHerb_Scotland
FodderHerb_SeineR
FodderHerb_ShebJubR
FodderHerb_SiberiaW
FodderHerb_SinaiP
FodderHerb_SpainCstSE
FodderHerb_Sweden
FodderHerb_SyrDaryaR
FodderHerb_TagusR
FodderHerb_Taiwan
FodderHerb_Tarim
FodderHerb_Tasmania
FodderHerb_Tehuantpc
FodderHerb_TennR
FodderHerb_TexasCst
FodderHerb_ThaiGulf
FodderHerb_TiberR
FodderHerb_TigrEuphR
FodderHerb_UralR
FodderHerb_UsaColoRN
FodderHerb_UsaColoRS
FodderHerb_UsaCstE
FodderHerb_UsaCstNE
FodderHerb_UsaCstSE
FodderHerb_UsaPacNW
FodderHerb_VietnamCst
FodderHerb_VolgaR
FodderHerb_WislaR
FodderHerb_XunJiang
FodderHerb_YeniseiR
FodderHerb_YucatanP
FodderHerbC4_AdrBlkSea
FodderHerbC4_AfrCstNE
FodderHerbC4_AfrIntN
FodderHerbC4_AmazonR
FodderHerbC4_AmuDaryaR
FodderHerbC4_AmurR
FodderHerbC4_ArabianP
FodderHerbC4_ArgColoR
FodderHerbC4_ArgCstN
FodderHerbC4_ArgCstS
FodderHerbC4_ArkWhtRedR
FodderHerbC4_BalticSea
FodderHerbC4_BarentsSea
FodderHerbC4_BlackSeaN
FodderHerbC4_BlackSeaS
FodderHerbC4_California
FodderHerbC4_CanAtl
FodderHerbC4_CaspianE
FodderHerbC4_CaspianNE
FodderHerbC4_CaspianSW
FodderHerbC4_ChileCstN
FodderHerbC4_ChileCstS
FodderHerbC4_ColEcuaCst
FodderHerbC4_DanubeR
FodderHerbC4_DaugavaR
FodderHerbC4_DeadSea
FodderHerbC4_DnieperR
FodderHerbC4_DniesterR
FodderHerbC4_DnkGrmCst
FodderHerbC4_DonR
FodderHerbC4_DouroR
FodderHerbC4_DvinaRN
FodderHerbC4_EbroR
FodderHerbC4_EJrdnSyr
FodderHerbC4_ElbeR
FodderHerbC4_EmsWeserR
FodderHerbC4_EngWales
FodderHerbC4_Finland
FodderHerbC4_FranceCstS
FodderHerbC4_FranceCstW
FodderHerbC4_FraserR
FodderHerbC4_Gironde
FodderHerbC4_Gobi
FodderHerbC4_GreatBasin
FodderHerbC4_GreatLakes
FodderHerbC4_GuadalqR
FodderHerbC4_GuadianaR
FodderHerbC4_HudsonBay
FodderHerbC4_IberiaCst
FodderHerbC4_Ireland

biomassTree_MexBaja_IRR_lo
biomassTree_MexBaja_RFD_hi
biomassTree_MexBaja_RFD_lo
biomassTree_MexCstNW_IRR_hi
biomassTree_MexCstNW_IRR_lo
biomassTree_MexCstNW_RFD_hi
biomassTree_MexCstNW_RFD_lo
biomassTree_MexCstW_IRR_hi
biomassTree_MexCstW_IRR_lo
biomassTree_MexCstW_RFD_hi
biomassTree_MexCstW_RFD_lo
biomassTree_MexGulf_IRR_hi
biomassTree_MexGulf_IRR_lo
biomassTree_MexGulf_RFD_hi
biomassTree_MexGulf_RFD_lo
biomassTree_MexInt_IRR_hi
biomassTree_MexInt_IRR_lo
biomassTree_MexInt_RFD_hi
biomassTree_MexInt_RFD_lo
biomassTree_MissouriR_IRR_hi
biomassTree_MissouriR_IRR_lo
biomassTree_MissouriR_RFD_hi
biomassTree_MissouriR_RFD_lo
biomassTree_MissppRN_IRR_hi
biomassTree_MissppRN_IRR_lo
biomassTree_MissppRN_RFD_hi
biomassTree_MissppRN_RFD_lo
biomassTree_MissppRS_IRR_hi
biomassTree_MissppRS_IRR_lo
biomassTree_MissppRS_RFD_hi
biomassTree_MissppRS_RFD_lo
biomassTree_MurrayDrlg_IRR_hi
biomassTree_MurrayDrlg_IRR_lo
biomassTree_MurrayDrlg_RFD_hi
biomassTree_MurrayDrlg_RFD_lo
biomassTree_NarmadaR_IRR_hi
biomassTree_NarmadaR_IRR_lo
biomassTree_NarmadaR_RFD_hi
biomassTree_NarmadaR_RFD_lo
biomassTree_NarvaR_IRR_hi
biomassTree_NarvaR_IRR_lo
biomassTree_NarvaR_RFD_hi
biomassTree_NarvaR_RFD_lo
biomassTree_NegroR_IRR_hi
biomassTree_NegroR_IRR_lo
biomassTree_NegroR_RFD_hi
biomassTree_NegroR_RFD_lo
biomassTree_NelsonR_IRR_hi
biomassTree_NelsonR_IRR_lo
biomassTree_NelsonR_RFD_hi
biomassTree_NelsonR_RFD_lo
biomassTree_NemanR_IRR_hi
biomassTree_NemanR_IRR_lo
biomassTree_NemanR_RFD_hi
biomassTree_NemanR_RFD_lo
biomassTree_NevaR_IRR_hi
biomassTree_NevaR_IRR_lo
biomassTree_NevaR_RFD_hi
biomassTree_NevaR_RFD_lo
biomassTree_NewCaledn_RFD_hi
biomassTree_NewCaledn_RFD_lo
biomassTree_NewZealand_IRR_hi
biomassTree_NewZealand_IRR_lo
biomassTree_NewZealand_RFD_hi
biomassTree_NewZealand_RFD_lo
biomassTree_NigerR_IRR_hi
biomassTree_NigerR_IRR_lo
biomassTree_NigerR_RFD_hi
biomassTree_NigerR_RFD_lo
biomassTree_NileR_IRR_hi
biomassTree_NileR_IRR_lo
biomassTree_NileR_RFD_hi
biomassTree_NileR_RFD_lo
biomassTree_NWTerr_IRR_hi
biomassTree_NWTerr_IRR_lo
biomassTree_NWTerr_RFD_hi
biomassTree_NWTerr_RFD_lo
biomassTree_ObR_IRR_hi
biomassTree_ObR_IRR_lo
biomassTree_ObR_RFD_hi
biomassTree_ObR_RFD_lo
biomassTree_OderR_IRR_hi
biomassTree_OderR_IRR_lo
biomassTree_OderR_RFD_hi
biomassTree_OderR_RFD_lo
biomassTree_OhioR_IRR_hi
biomassTree_OhioR_IRR_lo
biomassTree_OhioR_RFD_hi
biomassTree_OhioR_RFD_lo
biomassTree_OrangeR_IRR_hi
biomassTree_OrangeR_IRR_lo
biomassTree_OrangeR_RFD_hi
biomassTree_OrangeR_RFD_lo
biomassTree_OrinocoR_IRR_hi
biomassTree_OrinocoR_IRR_lo
biomassTree_OrinocoR_RFD_hi

FodderHerbC4_ItalyCstE
FodderHerbC4_ItalyCstW
FodderHerbC4_Japan
FodderHerbC4_LaPuna
FodderHerbC4_LBalkash
FodderHerbC4_LenaR
FodderHerbC4_LoireR
FodderHerbC4_Mackenzie
FodderHerbC4_MarChiq
FodderHerbC4_MeditE
FodderHerbC4_MeditIsl
FodderHerbC4_MeditS
FodderHerbC4_MexBaja
FodderHerbC4_MexCstNW
FodderHerbC4_MexCstW
FodderHerbC4_MexGulf
FodderHerbC4_MexInt
FodderHerbC4_MissouriR
FodderHerbC4_MissppRN
FodderHerbC4_MissppRS
FodderHerbC4_NarvaR
FodderHerbC4_NegroR
FodderHerbC4_NelsonR
FodderHerbC4_NemanR
FodderHerbC4_NevaR
FodderHerbC4_NewZealand
FodderHerbC4_NWTerr
FodderHerbC4_ObR
FodderHerbC4_OderR
FodderHerbC4_OhioR
FodderHerbC4_PacArctic
FodderHerbC4_Pampas
FodderHerbC4_Papaloapan
FodderHerbC4_PeruCst
FodderHerbC4_PolandCst
FodderHerbC4_PoR
FodderHerbC4_RedSeaE
FodderHerbC4_RhineR
FodderHerbC4_RhoneR
FodderHerbC4_RioBalsas
FodderHerbC4_RioGrande
FodderHerbC4_RioLaPlata
FodderHerbC4_RioLerma
FodderHerbC4_RioVerde
FodderHerbC4_RusCstSE
FodderHerbC4_Salinas
FodderHerbC4_ScheldtR
FodderHerbC4_Scotland
FodderHerbC4_SeineR
FodderHerbC4_SiberiaW
FodderHerbC4_SpainCstSE
FodderHerbC4_StLwrncR
FodderHerbC4_Sweden
FodderHerbC4_SyrDaryaR
FodderHerbC4_TagusR
FodderHerbC4_Taiwan
FodderHerbC4_Tarim
FodderHerbC4_Tehuantpc
FodderHerbC4_TennR
FodderHerbC4_TexasCst
FodderHerbC4_TiberR
FodderHerbC4_TigrEuphR
FodderHerbC4_UralR
FodderHerbC4_UsaColoRN
FodderHerbC4_UsaColoRS
FodderHerbC4_UsaCstE
FodderHerbC4_UsaCstNE
FodderHerbC4_UsaCstSE
FodderHerbC4_UsaPacNW
FodderHerbC4_VolgaR
FodderHerbC4_WislaR
FodderHerbC4_YeniseiR
forecourt production
ForestFire_AdrBlkSea
ForestFire_AfrCstW
ForestFire_AmazonR
ForestFire_AmuDaryaR
ForestFire_AmurR
ForestFire_ArgColoR
ForestFire_ArgCstS
ForestFire_ArkWhtRedR
ForestFire_AusCstE
ForestFire_AusCstN
ForestFire_AusCstS
ForestFire_AusCstW
ForestFire_BalticSea
ForestFire_BarentsSea
ForestFire_BengalBay
ForestFire_BlackSeaN
ForestFire_BlackSeaS
ForestFire_BoHai
ForestFire_BorneoCstN
ForestFire_BrzCstE
ForestFire_BrzCstN
ForestFire_BrzCstS
ForestFire_California
biomassTree_OrinocoR_RFD_lo
biomassTree_PacArctic_IRR_hi
biomassTree_PacArctic_IRR_lo
biomassTree_PacArctic_RFD_hi
biomassTree_PacArctic_RFD_lo
biomassTree_Pampas_IRR_hi
biomassTree_Pampas_IRR_lo
biomassTree_Pampas_RFD_hi
biomassTree_Pampas_RFD_lo
biomassTree_Papaloapan_IRR_hi
biomassTree_Papaloapan_IRR_lo
biomassTree_Papaloapan_RFD_hi
biomassTree_Papaloapan_RFD_lo
biomassTree_PapuaCst_RFD_hi
biomassTree_PapuaCst_RFD_lo
biomassTree_ParnaibaR_IRR_hi
biomassTree_ParnaibaR_IRR_lo
biomassTree_ParnaibaR_RFD_hi
biomassTree_ParnaibaR_RFD_lo
biomassTree_Patagonia_IRR_hi
biomassTree_Patagonia_IRR_lo
biomassTree_Patagonia_RFD_hi
biomassTree_Patagonia_RFD_lo
biomassTree_PennarR_IRR_hi
biomassTree_PennarR_IRR_lo
biomassTree_PennarR_RFD_hi
biomassTree_PennarR_RFD_lo
biomassTree_PeruCst_IRR_hi
biomassTree_PeruCst_IRR_lo
biomassTree_PeruCst_RFD_hi
biomassTree_PeruCst_RFD_lo
biomassTree_Phlppns_IRR_hi
biomassTree_Phlppns_IRR_lo
biomassTree_Phlppns_RFD_hi
biomassTree_Phlppns_RFD_lo
biomassTree_PolandCst_IRR_hi
biomassTree_PolandCst_IRR_lo
biomassTree_PolandCst_RFD_hi
biomassTree_PolandCst_RFD_lo
biomassTree_PoR_IRR_hi
biomassTree_PoR_IRR_lo
biomassTree_PoR_RFD_hi
biomassTree_PoR_RFD_lo
biomassTree_RhineR_IRR_hi
biomassTree_RhineR_IRR_lo
biomassTree_RhineR_RFD_hi
biomassTree_RhineR_RFD_lo
biomassTree_RhoneR_IRR_hi
biomassTree_RhoneR_IRR_lo
biomassTree_RhoneR_RFD_hi
biomassTree_RhoneR_RFD_lo
biomassTree_RiftValley_IRR_hi
biomassTree_RiftValley_IRR_lo
biomassTree_RiftValley_RFD_hi
biomassTree_RiftValley_RFD_lo
biomassTree_RioBalsas_IRR_hi
biomassTree_RioBalsas_IRR_lo
biomassTree_RioBalsas_RFD_hi
biomassTree_RioBalsas_RFD_lo
biomassTree_RioGrande_IRR_hi
biomassTree_RioGrande_IRR_lo
biomassTree_RioGrande_RFD_hi
biomassTree_RioGrande_RFD_lo
biomassTree_RioLaPlata_IRR_hi
biomassTree_RioLaPlata_IRR_lo
biomassTree_RioLaPlata_RFD_hi
biomassTree_RioLaPlata_RFD_lo
biomassTree_RioLerma_IRR_hi
biomassTree_RioLerma_IRR_lo
biomassTree_RioLerma_RFD_hi
biomassTree_RioLerma_RFD_lo
biomassTree_RioVerde_IRR_hi
biomassTree_RioVerde_IRR_lo
biomassTree_RioVerde_RFD_hi
biomassTree_RioVerde_RFD_lo
biomassTree_RusCstSE_IRR_hi
biomassTree_RusCstSE_IRR_lo
biomassTree_RusCstSE_RFD_hi
biomassTree_RusCstSE_RFD_lo
biomassTree_SabarmatiR_IRR_hi
biomassTree_SabarmatiR_IRR_lo
biomassTree_SabarmatiR_RFD_hi
biomassTree_SabarmatiR_RFD_lo
biomassTree_Salinas_IRR_hi
biomassTree_Salinas_IRR_lo
biomassTree_Salinas_RFD_hi
biomassTree_Salinas_RFD_lo
biomassTree_Salween_IRR_hi
biomassTree_Salween_IRR_lo
biomassTree_Salween_RFD_hi
biomassTree_Salween_RFD_lo
biomassTree_SAmerCstN_IRR_hi
biomassTree_SAmerCstN_IRR_lo
biomassTree_SAmerCstN_RFD_hi
biomassTree_SAmerCstN_RFD_lo
biomassTree_SAmerCstNE_IRR_hi

ForestFire_CanAtl
ForestFire_Caribbean
ForestFire_CaspianNE
ForestFire_CaspianSW
ForestFire_ChaoPhrR
ForestFire_ChileCstN
ForestFire_ChileCstS
ForestFire_ChinaCst
ForestFire_ChurchillR
ForestFire_CntAmer
ForestFire_ColEcuaCst
ForestFire_CongoR
ForestFire_DanubeR
ForestFire_DaugavaR
ForestFire_DnieperR
ForestFire_DniesterR
ForestFire_DnkGrmCst
ForestFire_DonR
ForestFire_DvinaRN
ForestFire_ElbeR
ForestFire_Finland
ForestFire_FlyR
ForestFire_FraserR
ForestFire_GangesR
ForestFire_Gobi
ForestFire_GreatBasin
ForestFire_GreatLakes
ForestFire_GrijUsuR
ForestFire_GuineaGulf
ForestFire_Hong
ForestFire_HudsonBay
ForestFire_Iceland
ForestFire_IdnE
ForestFire_IrianJaya
ForestFire_IrrawaddyR
ForestFire_Japan
ForestFire_JavaTimor
ForestFire_Kalimantan
ForestFire_KaraSea
ForestFire_Korea
ForestFire_LaPuna
ForestFire_LBalkash
ForestFire_LChad
ForestFire_LenaR
ForestFire_Mackenzie
ForestFire_MalaysiaP
ForestFire_MarChiq
ForestFire_MeditE
ForestFire_Mekong
ForestFire_MexBaja
ForestFire_MexCstNW
ForestFire_MexCstW
ForestFire_MexGulf
ForestFire_MexInt
ForestFire_MissouriR
ForestFire_MissppRN
ForestFire_MissppRS
ForestFire_MurrayDrlg
ForestFire_NarvaR
ForestFire_NegroR
ForestFire_NelsonR
ForestFire_NemanR
ForestFire_NevaR
ForestFire_NewCaledn
ForestFire_NewZealand
ForestFire_NigerR
ForestFire_NileR
ForestFire_NWTerr
ForestFire_ObR
ForestFire_OderR
ForestFire_OhioR
ForestFire_OrinocoR
ForestFire_PacArctic
ForestFire_Pampas
ForestFire_Papaloapan
ForestFire_PapuaCst
ForestFire_ParnaibaR
ForestFire_Patagonia
ForestFire_PeruCst
ForestFire_Phlppns
ForestFire_PolandCst
ForestFire_PoR
ForestFire_RhineR
ForestFire_RhoneR
ForestFire_RioBalsas
ForestFire_RioGrande
ForestFire_RioLaPlata
ForestFire_RioLerma
ForestFire_RioVerde
ForestFire_RusCstSE
ForestFire_Salinas
ForestFire_Salween
ForestFire_SAmerCstN
ForestFire_SAmerCstNE
ForestFire_SaoFrancR
ForestFire_SChinaSea
biomassTree_SAmerCstNE_IRR_lo
biomassTree_SAmerCstNE_RFD_hi
biomassTree_SAmerCstNE_RFD_lo
biomassTree_SaoFrancR_IRR_hi
biomassTree_SaoFrancR_IRR_lo
biomassTree_SaoFrancR_RFD_hi
biomassTree_SaoFrancR_RFD_lo
biomassTree_ScheldtR_IRR_hi
biomassTree_ScheldtR_IRR_lo
biomassTree_ScheldtR_RFD_hi
biomassTree_ScheldtR_RFD_lo
biomassTree_SChinaSea_IRR_hi
biomassTree_SChinaSea_IRR_lo
biomassTree_SChinaSea_RFD_hi
biomassTree_SChinaSea_RFD_lo
biomassTree_ScndnvN_IRR_hi
biomassTree_ScndnvN_IRR_lo
biomassTree_ScndnvN_RFD_hi
biomassTree_ScndnvN_RFD_lo
biomassTree_Scotland_IRR_hi
biomassTree_Scotland_IRR_lo
biomassTree_Scotland_RFD_hi
biomassTree_Scotland_RFD_lo
biomassTree_SeineR_IRR_hi
biomassTree_SeineR_IRR_lo
biomassTree_SeineR_RFD_hi
biomassTree_SeineR_RFD_lo
biomassTree_SenegalR_IRR_hi
biomassTree_SenegalR_IRR_lo
biomassTree_SenegalR_RFD_hi
biomassTree_SenegalR_RFD_lo
biomassTree_SepikR_RFD_hi
biomassTree_SepikR_RFD_lo
biomassTree_ShebJubR_IRR_hi
biomassTree_ShebJubR_IRR_lo
biomassTree_ShebJubR_RFD_hi
biomassTree_ShebJubR_RFD_lo
biomassTree_SiberiaN_RFD_hi
biomassTree_SiberiaN_RFD_lo
biomassTree_SiberiaW_IRR_hi
biomassTree_SiberiaW_IRR_lo
biomassTree_SiberiaW_RFD_hi
biomassTree_SiberiaW_RFD_lo
biomassTree_SittaungR_IRR_hi
biomassTree_SittaungR_IRR_lo
biomassTree_SittaungR_RFD_hi
biomassTree_SittaungR_RFD_lo
biomassTree_SolomonIsl_RFD_hi
biomassTree_SolomonIsl_RFD_lo
biomassTree_SpainCstSE_IRR_hi
biomassTree_SpainCstSE_IRR_lo
biomassTree_SpainCstSE_RFD_hi
biomassTree_SpainCstSE_RFD_lo
biomassTree_SriLanka_IRR_hi
biomassTree_SriLanka_IRR_lo
biomassTree_SriLanka_RFD_hi
biomassTree_SriLanka_RFD_lo
biomassTree_StLwrncR_IRR_hi
biomassTree_StLwrncR_IRR_lo
biomassTree_StLwrncR_RFD_hi
biomassTree_StLwrncR_RFD_lo
biomassTree_Sulawesi_IRR_hi
biomassTree_Sulawesi_IRR_lo
biomassTree_Sulawesi_RFD_hi
biomassTree_Sulawesi_RFD_lo
biomassTree_Sumatra_IRR_hi
biomassTree_Sumatra_IRR_lo
biomassTree_Sumatra_RFD_hi
biomassTree_Sumatra_RFD_lo
biomassTree_Sweden_IRR_hi
biomassTree_Sweden_IRR_lo
biomassTree_Sweden_RFD_hi
biomassTree_Sweden_RFD_lo
biomassTree_SyrDaryaR_IRR_hi
biomassTree_SyrDaryaR_IRR_lo
biomassTree_SyrDaryaR_RFD_hi
biomassTree_SyrDaryaR_RFD_lo
biomassTree_TagusR_IRR_hi
biomassTree_TagusR_IRR_lo
biomassTree_TagusR_RFD_hi
biomassTree_TagusR_RFD_lo
biomassTree_Taiwan_IRR_hi
biomassTree_Taiwan_IRR_lo
biomassTree_Taiwan_RFD_hi
biomassTree_Taiwan_RFD_lo
biomassTree_TaptiR_IRR_hi
biomassTree_TaptiR_IRR_lo
biomassTree_TaptiR_RFD_hi
biomassTree_TaptiR_RFD_lo
biomassTree_Tasmania_IRR_hi
biomassTree_Tasmania_IRR_lo
biomassTree_Tasmania_RFD_hi
biomassTree_Tasmania_RFD_lo
biomassTree_Tehuantpc_IRR_hi
biomassTree_Tehuantpc_IRR_lo
biomassTree_Tehuantpc_RFD_hi

ForestFire_ScndnvN
ForestFire_SenegalR
ForestFire_SepikR
ForestFire_SiberiaN
ForestFire_SiberiaW
ForestFire_SittaungR
ForestFire_SolomonIsl
ForestFire_SriLanka
ForestFire_StLwrncR
ForestFire_Sweden
ForestFire_SyrDaryaR
ForestFire_Taiwan
ForestFire_Tasmania
ForestFire_Tehuantpc
ForestFire_TennR
ForestFire_TexasCst
ForestFire_ThaiGulf
ForestFire_TigrEuphR
ForestFire_TocantinsR
ForestFire_UralR
ForestFire_UsaColoRN
ForestFire_UsaColoRS
ForestFire_UsaCstE
ForestFire_UsaCstNE
ForestFire_UsaCstSE
ForestFire_UsaPacNW
ForestFire_VietnamCst
ForestFire_VolgaR
ForestFire_VoltaR
ForestFire_WislaR
ForestFire_XunJiang
ForestFire_YeniseiR
ForestFire_YucatanP
ForestFire_ZambeziR
Freight Rail
Fruits_AdrBlkSea
Fruits_AfrCstE
Fruits_AfrCstNE
Fruits_AfrCstNW
Fruits_AfrCstS
Fruits_AfrCstSE
Fruits_AfrCstSSW
Fruits_AfrCstSW
Fruits_AfrCstW
Fruits_AfrIntN
Fruits_AfrIntS
Fruits_AmazonR
Fruits_AmuDaryaR
Fruits_AmurR
Fruits_AngolaCst
Fruits_ArabianP
Fruits_ArabianSea
Fruits_ArgColoR
Fruits_ArgCstN
Fruits_ArgCstS
Fruits_ArkWhtRedR
Fruits_AusCstE
Fruits_AusCstN
Fruits_AusCstS
Fruits_AusCstW
Fruits_AusInt
Fruits_BalticSea
Fruits_BarentsSea
Fruits_BengalBay
Fruits_BengalW
Fruits_BlackSeaN
Fruits_BlackSeaS
Fruits_BoHai
Fruits_BorneoCstN
Fruits_BrahmaniR
Fruits_BrzCstE
Fruits_BrzCstN
Fruits_BrzCstS
Fruits_California
Fruits_CanAtl
Fruits_Caribbean
Fruits_CaspianE
Fruits_CaspianNE
Fruits_CaspianSW
Fruits_CauveryR
Fruits_ChaoPhrR
Fruits_ChileCstN
Fruits_ChileCstS
Fruits_ChinaCst
Fruits_CntAmer
Fruits_ColEcuaCst
Fruits_CongoR
Fruits_DanubeR
Fruits_DaugavaR
Fruits_DeadSea
Fruits_DnieperR
Fruits_DniesterR
Fruits_DnkGrmCst
Fruits_DonR
Fruits_DouroR
Fruits_DvinaRN
biomassTree_Tehuantpc_RFD_lo
biomassTree_TennR_IRR_hi
biomassTree_TennR_IRR_lo
biomassTree_TennR_RFD_hi
biomassTree_TennR_RFD_lo
biomassTree_TexasCst_IRR_hi
biomassTree_TexasCst_IRR_lo
biomassTree_TexasCst_RFD_hi
biomassTree_TexasCst_RFD_lo
biomassTree_ThaiGulf_IRR_hi
biomassTree_ThaiGulf_IRR_lo
biomassTree_ThaiGulf_RFD_hi
biomassTree_ThaiGulf_RFD_lo
biomassTree_TiberR_IRR_hi
biomassTree_TiberR_IRR_lo
biomassTree_TiberR_RFD_hi
biomassTree_TiberR_RFD_lo
biomassTree_TigrEuphR_IRR_hi
biomassTree_TigrEuphR_IRR_lo
biomassTree_TigrEuphR_RFD_hi
biomassTree_TigrEuphR_RFD_lo
biomassTree_TocantinsR_IRR_hi
biomassTree_TocantinsR_IRR_lo
biomassTree_TocantinsR_RFD_hi
biomassTree_TocantinsR_RFD_lo
biomassTree_UralR_IRR_hi
biomassTree_UralR_IRR_lo
biomassTree_UralR_RFD_hi
biomassTree_UralR_RFD_lo
biomassTree_UsaColoRN_IRR_hi
biomassTree_UsaColoRN_IRR_lo
biomassTree_UsaColoRN_RFD_hi
biomassTree_UsaColoRN_RFD_lo
biomassTree_UsaColoRS_IRR_hi
biomassTree_UsaColoRS_IRR_lo
biomassTree_UsaColoRS_RFD_hi
biomassTree_UsaColoRS_RFD_lo
biomassTree_UsaCstE_IRR_hi
biomassTree_UsaCstE_IRR_lo
biomassTree_UsaCstE_RFD_hi
biomassTree_UsaCstE_RFD_lo
biomassTree_UsaCstNE_IRR_hi
biomassTree_UsaCstNE_IRR_lo
biomassTree_UsaCstNE_RFD_hi
biomassTree_UsaCstNE_RFD_lo
biomassTree_UsaCstSE_IRR_hi
biomassTree_UsaCstSE_IRR_lo
biomassTree_UsaCstSE_RFD_hi
biomassTree_UsaCstSE_RFD_lo
biomassTree_UsaPacNW_IRR_hi
biomassTree_UsaPacNW_IRR_lo
biomassTree_UsaPacNW_RFD_hi
biomassTree_UsaPacNW_RFD_lo
biomassTree_VietnamCst_IRR_hi
biomassTree_VietnamCst_IRR_lo
biomassTree_VietnamCst_RFD_hi
biomassTree_VietnamCst_RFD_lo
biomassTree_VolgaR_IRR_hi
biomassTree_VolgaR_IRR_lo
biomassTree_VolgaR_RFD_hi
biomassTree_VolgaR_RFD_lo
biomassTree_VoltaR_IRR_hi
biomassTree_VoltaR_IRR_lo
biomassTree_VoltaR_RFD_hi
biomassTree_VoltaR_RFD_lo
biomassTree_WislaR_IRR_hi
biomassTree_WislaR_IRR_lo
biomassTree_WislaR_RFD_hi
biomassTree_WislaR_RFD_lo
biomassTree_XunJiang_IRR_hi
biomassTree_XunJiang_IRR_lo
biomassTree_XunJiang_RFD_hi
biomassTree_XunJiang_RFD_lo
biomassTree_Yangtze_IRR_hi
biomassTree_Yangtze_IRR_lo
biomassTree_Yangtze_RFD_hi
biomassTree_Yangtze_RFD_lo
biomassTree_YeniseiR_IRR_hi
biomassTree_YeniseiR_IRR_lo
biomassTree_YeniseiR_RFD_hi
biomassTree_YeniseiR_RFD_lo
biomassTree_YucatanP_IRR_hi
biomassTree_YucatanP_IRR_lo
biomassTree_YucatanP_RFD_hi
biomassTree_YucatanP_RFD_lo
biomassTree_ZambeziR_IRR_hi
biomassTree_ZambeziR_IRR_lo
biomassTree_ZambeziR_RFD_hi
biomassTree_ZambeziR_RFD_lo
biomassTree_ZiyaHe_IRR_hi
biomassTree_ZiyaHe_IRR_lo
biomassTree_ZiyaHe_RFD_hi
biomassTree_ZiyaHe_RFD_lo
BLASTFUR
cellulosic ethanol
cellulosic ethanol CCS level 1

| | |
|---|---|
| Fruits_EbroR | cellulosic ethanol CCS level 2 |
| Fruits_EJrdnSyr | coal |
| Fruits_ElbeR | coal (conv pul CCS) |
| Fruits_EmsWeserR | coal (conv pul) |
| Fruits_EngWales | coal (IGCC CCS) |
| Fruits_FarahrudR | coal (IGCC) |
| Fruits_Finland | coal chemical CCS |
| Fruits_FlyR | coal to liquids |
| Fruits_FranceCstS | coal to liquids CCS level 1 |
| Fruits_FranceCstW | coal to liquids CCS level 2 |
| Fruits_FraserR | corn ethanol |
| Fruits_GangesR | CornC4_AdrBlkSea_IRR_hi |
| Fruits_Gironde | CornC4_AdrBlkSea_IRR_lo |
| Fruits_Gobi | CornC4_AdrBlkSea_RFD_hi |
| Fruits_GodavariR | CornC4_AdrBlkSea_RFD_lo |
| Fruits_GreatBasin | CornC4_AfrCstE_IRR_hi |
| Fruits_GreatLakes | CornC4_AfrCstE_IRR_lo |
| Fruits_GrijUsuR | CornC4_AfrCstE_RFD_hi |
| Fruits_GuadalqR | CornC4_AfrCstE_RFD_lo |
| Fruits_GuadianaR | CornC4_AfrCstNE_IRR_hi |
| Fruits_GuineaGulf | CornC4_AfrCstNE_IRR_lo |
| Fruits_Hainan | CornC4_AfrCstNE_RFD_hi |
| Fruits_HamuMashR | CornC4_AfrCstNE_RFD_lo |
| Fruits_Helmand | CornC4_AfrCstNW_IRR_hi |
| Fruits_Hong | CornC4_AfrCstNW_IRR_lo |
| Fruits_HuangHeR | CornC4_AfrCstNW_RFD_hi |
| Fruits_HudsonBay | CornC4_AfrCstNW_RFD_lo |
| Fruits_IberiaCst | CornC4_AfrCstS_IRR_hi |
| Fruits_IdnE | CornC4_AfrCstS_IRR_lo |
| Fruits_IndCstE | CornC4_AfrCstS_RFD_hi |
| Fruits_IndCstNE | CornC4_AfrCstS_RFD_lo |
| Fruits_IndCstS | CornC4_AfrCstSE_IRR_hi |
| Fruits_IndCstW | CornC4_AfrCstSE_IRR_lo |
| Fruits_IndusR | CornC4_AfrCstSE_RFD_hi |
| Fruits_Iran | CornC4_AfrCstSE_RFD_lo |
| Fruits_Ireland | CornC4_AfrCstSSW_IRR_hi |
| Fruits_IrianJaya | CornC4_AfrCstSSW_IRR_lo |
| Fruits_IrrawaddyR | CornC4_AfrCstSSW_RFD_hi |
| Fruits_ItalyCstE | CornC4_AfrCstSSW_RFD_lo |
| Fruits_ItalyCstW | CornC4_AfrCstSW_IRR_hi |
| Fruits_Japan | CornC4_AfrCstSW_IRR_lo |
| Fruits_JavaTimor | CornC4_AfrCstSW_RFD_hi |
| Fruits_Kalimantan | CornC4_AfrCstSW_RFD_lo |
| Fruits_Korea | CornC4_AfrCstW_IRR_hi |
| Fruits_KrishnaR | CornC4_AfrCstW_IRR_lo |
| Fruits_LaPuna | CornC4_AfrCstW_RFD_hi |
| Fruits_LBalkash | CornC4_AfrCstW_RFD_lo |
| Fruits_LChad | CornC4_AfrIntN_IRR_hi |
| Fruits_LenaR | CornC4_AfrIntN_IRR_lo |
| Fruits_LimpopoR | CornC4_AfrIntN_RFD_hi |
| Fruits_LoireR | CornC4_AfrIntN_RFD_lo |
| Fruits_Mackenzie | CornC4_AfrIntS_IRR_hi |
| Fruits_Madagascar | CornC4_AfrIntS_IRR_lo |
| Fruits_MagdalenaR | CornC4_AfrIntS_RFD_hi |
| Fruits_MahanadiR | CornC4_AfrIntS_RFD_lo |
| Fruits_MahiR | CornC4_AmazonR_IRR_hi |
| Fruits_MalaysiaP | CornC4_AmazonR_IRR_lo |
| Fruits_MarChiq | CornC4_AmazonR_RFD_hi |
| Fruits_MeditE | CornC4_AmazonR_RFD_lo |
| Fruits_MeditIsl | CornC4_AmuDaryaR_IRR_hi |
| Fruits_MeditS | CornC4_AmuDaryaR_IRR_lo |
| Fruits_Mekong | CornC4_AmurR_IRR_hi |
| Fruits_MexBaja | CornC4_AmurR_IRR_lo |
| Fruits_MexCstNW | CornC4_AmurR_RFD_hi |
| Fruits_MexCstW | CornC4_AmurR_RFD_lo |
| Fruits_MexGulf | CornC4_AngolaCst_RFD_hi |
| Fruits_MexInt | CornC4_AngolaCst_RFD_lo |
| Fruits_MissouriR | CornC4_ArabianP_IRR_hi |
| Fruits_MisspRN | CornC4_ArabianP_IRR_lo |
| Fruits_MisspRS | CornC4_ArabianP_RFD_hi |
| Fruits_MurrayDrlg | CornC4_ArabianP_RFD_lo |
| Fruits_NarmadaR | CornC4_ArabianSea_IRR_hi |
| Fruits_NarvaR | CornC4_ArabianSea_IRR_lo |
| Fruits_NegroR | CornC4_ArabianSea_RFD_hi |
| Fruits_NelsonR | CornC4_ArabianSea_RFD_lo |
| Fruits_NemanR | CornC4_ArgColoR_IRR_hi |
| Fruits_NevaR | CornC4_ArgColoR_IRR_lo |
| Fruits_NewCaledn | CornC4_ArgColoR_RFD_hi |
| Fruits_NewZealand | CornC4_ArgColoR_RFD_lo |
| Fruits_NigerR | CornC4_ArgCstN_IRR_hi |
| Fruits_NileR | CornC4_ArgCstN_IRR_lo |
| Fruits_NWTerr | CornC4_ArgCstN_RFD_hi |
| Fruits_ObR | CornC4_ArgCstN_RFD_lo |
| Fruits_OderR | CornC4_ArgCstS_RFD_hi |
| Fruits_OhioR | CornC4_ArgCstS_RFD_lo |
| Fruits_OrangeR | CornC4_ArkWhtRedR_IRR_hi |
| Fruits_OrinocoR | CornC4_ArkWhtRedR_IRR_lo |
| Fruits_PacArctic | CornC4_ArkWhtRedR_RFD_hi |
| Fruits_Pampas | CornC4_ArkWhtRedR_RFD_lo |
| Fruits_Papaloapan | CornC4_AusCstE_IRR_hi |
| Fruits_PapuaCst | CornC4_AusCstE_IRR_lo |
| Fruits_ParnaibaR | CornC4_AusCstE_RFD_hi |
| Fruits_Patagonia | CornC4_AusCstE_RFD_lo |
| Fruits_PennarR | CornC4_AusCstN_IRR_hi |
| Fruits_PersianGulf | CornC4_AusCstN_IRR_lo |
| Fruits_PeruCst | CornC4_AusCstN_RFD_hi |

Fruits_Phlppns
Fruits_PolandCst
Fruits_PoR
Fruits_RedSeaE
Fruits_RhineR
Fruits_RhoneR
Fruits_RiftValley
Fruits_RioBalsas
Fruits_RioGrande
Fruits_RioLaPlata
Fruits_RioLerma
Fruits_RioVerde
Fruits_RusCstSE
Fruits_SabarmatiR
Fruits_Salinas
Fruits_Salween
Fruits_SAmerCstN
Fruits_SAmerCstNE
Fruits_SaoFrancR
Fruits_ScheldtR
Fruits_SChinaSea
Fruits_ScndnvN
Fruits_Scotland
Fruits_SeineR
Fruits_SenegalR
Fruits_SepikR
Fruits_ShebJubR
Fruits_SiberiaW
Fruits_SinaiP
Fruits_SolomonIsl
Fruits_SpainCstSE
Fruits_SriLanka
Fruits_StLwrncR
Fruits_Sulawesi
Fruits_Sumatra
Fruits_Sweden
Fruits_SyrDaryaR
Fruits_TagusR
Fruits_Taiwan
Fruits_TaptiR
Fruits_Tarim
Fruits_Tasmania
Fruits_Tehuantpc
Fruits_TennR
Fruits_TexasCst
Fruits_ThaiGulf
Fruits_TiberR
Fruits_TigrEuphR
Fruits_TocantinsR
Fruits_UralR
Fruits_UsaColoRN
Fruits_UsaColoRS
Fruits_UsaCstE
Fruits_UsaCstNE
Fruits_UsaCstSE
Fruits_UsaPacNW
Fruits_VietnamCst
Fruits_VolgaR
Fruits_VoltaR
Fruits_WislaR
Fruits_XunJiang
Fruits_Yangtze
Fruits_YeniseiR
Fruits_YucatanP
Fruits_ZambeziR
Fruits_ZiyaHe
FruitsTree_AdrBlkSea
FruitsTree_AfrCstE
FruitsTree_AfrCstNE
FruitsTree_AfrCstNW
FruitsTree_AfrCstS
FruitsTree_AfrCstSE
FruitsTree_AfrCstSSW
FruitsTree_AfrCstSW
FruitsTree_AfrCstW
FruitsTree_AfrIntN
FruitsTree_AfrIntS
FruitsTree_AmazonR
FruitsTree_AmuDaryaR
FruitsTree_AmurR
FruitsTree_AngolaCst
FruitsTree_ArabianP
FruitsTree_ArabianSea
FruitsTree_ArgColoR
FruitsTree_ArgCstN
FruitsTree_ArgCstS
FruitsTree_ArkWhtRedR
FruitsTree_AusCstE
FruitsTree_AusCstN
FruitsTree_AusCstS
FruitsTree_AusCstW
FruitsTree_AusInt
FruitsTree_BalticSea
FruitsTree_BarentsSea
FruitsTree_BengalBay
FruitsTree_BengalW
CornC4_AusCstN_RFD_lo
CornC4_AusCstS_IRR_hi
CornC4_AusCstS_IRR_lo
CornC4_AusCstS_RFD_hi
CornC4_AusCstS_RFD_lo
CornC4_AusCstW_IRR_hi
CornC4_AusCstW_IRR_lo
CornC4_AusCstW_RFD_hi
CornC4_AusCstW_RFD_lo
CornC4_AusInt_RFD_hi
CornC4_AusInt_RFD_lo
CornC4_BalticSea_IRR_hi
CornC4_BalticSea_IRR_lo
CornC4_BalticSea_RFD_hi
CornC4_BalticSea_RFD_lo
CornC4_BarentsSea_IRR_hi
CornC4_BarentsSea_IRR_lo
CornC4_BarentsSea_RFD_hi
CornC4_BarentsSea_RFD_lo
CornC4_BengalBay_IRR_hi
CornC4_BengalBay_IRR_lo
CornC4_BengalBay_RFD_hi
CornC4_BengalBay_RFD_lo
CornC4_BengalW_IRR_hi
CornC4_BengalW_IRR_lo
CornC4_BengalW_RFD_hi
CornC4_BengalW_RFD_lo
CornC4_BlackSeaN_IRR_hi
CornC4_BlackSeaN_IRR_lo
CornC4_BlackSeaN_RFD_hi
CornC4_BlackSeaN_RFD_lo
CornC4_BlackSeaS_IRR_hi
CornC4_BlackSeaS_IRR_lo
CornC4_BlackSeaS_RFD_hi
CornC4_BlackSeaS_RFD_lo
CornC4_BoHai_IRR_hi
CornC4_BoHai_IRR_lo
CornC4_BoHai_RFD_hi
CornC4_BoHai_RFD_lo
CornC4_BorneoCstN_IRR_hi
CornC4_BorneoCstN_IRR_lo
CornC4_BorneoCstN_RFD_hi
CornC4_BorneoCstN_RFD_lo
CornC4_BrahmaniR_IRR_hi
CornC4_BrahmaniR_IRR_lo
CornC4_BrahmaniR_RFD_hi
CornC4_BrahmaniR_RFD_lo
CornC4_BrzCstE_IRR_hi
CornC4_BrzCstE_IRR_lo
CornC4_BrzCstE_RFD_hi
CornC4_BrzCstE_RFD_lo
CornC4_BrzCstN_IRR_hi
CornC4_BrzCstN_IRR_lo
CornC4_BrzCstN_RFD_hi
CornC4_BrzCstN_RFD_lo
CornC4_BrzCstS_IRR_hi
CornC4_BrzCstS_IRR_lo
CornC4_BrzCstS_RFD_hi
CornC4_BrzCstS_RFD_lo
CornC4_California_IRR_hi
CornC4_California_IRR_lo
CornC4_California_RFD_hi
CornC4_California_RFD_lo
CornC4_CanAtl_IRR_hi
CornC4_CanAtl_IRR_lo
CornC4_CanAtl_RFD_hi
CornC4_CanAtl_RFD_lo
CornC4_Caribbean_IRR_hi
CornC4_Caribbean_IRR_lo
CornC4_Caribbean_RFD_hi
CornC4_Caribbean_RFD_lo
CornC4_CaspianE_IRR_hi
CornC4_CaspianE_IRR_lo
CornC4_CaspianE_RFD_hi
CornC4_CaspianE_RFD_lo
CornC4_CaspianNE_IRR_hi
CornC4_CaspianNE_IRR_lo
CornC4_CaspianNE_RFD_hi
CornC4_CaspianNE_RFD_lo
CornC4_CaspianSW_IRR_hi
CornC4_CaspianSW_IRR_lo
CornC4_CaspianSW_RFD_hi
CornC4_CaspianSW_RFD_lo
CornC4_CauveryR_IRR_hi
CornC4_CauveryR_IRR_lo
CornC4_CauveryR_RFD_hi
CornC4_CauveryR_RFD_lo
CornC4_ChaoPhrR_IRR_hi
CornC4_ChaoPhrR_IRR_lo
CornC4_ChaoPhrR_RFD_hi
CornC4_ChaoPhrR_RFD_lo
CornC4_ChileCstN_IRR_hi
CornC4_ChileCstN_IRR_lo
CornC4_ChileCstN_RFD_hi
CornC4_ChileCstN_RFD_lo
CornC4_ChileCstS_IRR_hi

FruitsTree_BlackSeaN
FruitsTree_BlackSeaS
FruitsTree_BoHai
FruitsTree_BorneoCstN
FruitsTree_BrahmaniR
FruitsTree_BrzCstE
FruitsTree_BrzCstN
FruitsTree_BrzCstS
FruitsTree_California
FruitsTree_CanAtl
FruitsTree_Caribbean
FruitsTree_CaspianE
FruitsTree_CaspianNE
FruitsTree_CaspianSW
FruitsTree_CauveryR
FruitsTree_ChaoPhrR
FruitsTree_ChileCstN
FruitsTree_ChileCstS
FruitsTree_ChinaCst
FruitsTree_CntAmer
FruitsTree_ColEcuaCst
FruitsTree_CongoR
FruitsTree_DanubeR
FruitsTree_DaugavaR
FruitsTree_DeadSea
FruitsTree_DnieperR
FruitsTree_DniesterR
FruitsTree_DnkGrmCst
FruitsTree_DonR
FruitsTree_DouroR
FruitsTree_DvinaRN
FruitsTree_EbroR
FruitsTree_EJrdnSyr
FruitsTree_ElbeR
FruitsTree_EmsWeserR
FruitsTree_EngWales
FruitsTree_FarahrudR
FruitsTree_Finland
FruitsTree_FlyR
FruitsTree_FranceCstS
FruitsTree_FranceCstW
FruitsTree_FraserR
FruitsTree_GangesR
FruitsTree_Gironde
FruitsTree_Gobi
FruitsTree_GodavariR
FruitsTree_GreatBasin
FruitsTree_GreatLakes
FruitsTree_GrijUsuR
FruitsTree_GuadalqR
FruitsTree_GuadianaR
FruitsTree_GuineaGulf
FruitsTree_Hainan
FruitsTree_HamuMashR
FruitsTree_Helmand
FruitsTree_Hong
FruitsTree_HuangHeR
FruitsTree_HudsonBay
FruitsTree_IberiaCst
FruitsTree_IdnE
FruitsTree_IndCstE
FruitsTree_IndCstNE
FruitsTree_IndCstS
FruitsTree_IndCstW
FruitsTree_IndusR
FruitsTree_Iran
FruitsTree_Ireland
FruitsTree_IrianJaya
FruitsTree_IrrawaddyR
FruitsTree_ItalyCstE
FruitsTree_ItalyCstW
FruitsTree_Japan
FruitsTree_JavaTimor
FruitsTree_Kalimantan
FruitsTree_Korea
FruitsTree_KrishnaR
FruitsTree_LaPuna
FruitsTree_LBalkash
FruitsTree_LChad
FruitsTree_LenaR
FruitsTree_LimpopoR
FruitsTree_LoireR
FruitsTree_Madagascar
FruitsTree_MagdalenaR
FruitsTree_MahanadiR
FruitsTree_MahiR
FruitsTree_MalaysiaP
FruitsTree_MarChiq
FruitsTree_MeditE
FruitsTree_MeditIsl
FruitsTree_MeditS
FruitsTree_Mekong
FruitsTree_MexBaja
FruitsTree_MexCstNW
FruitsTree_MexCstW
FruitsTree_MexGulf
CornC4_ChileCstS_IRR_lo
CornC4_ChileCstS_RFD_hi
CornC4_ChileCstS_RFD_lo
CornC4_ChinaCst_IRR_hi
CornC4_ChinaCst_IRR_lo
CornC4_ChinaCst_RFD_hi
CornC4_ChinaCst_RFD_lo
CornC4_CntAmer_IRR_hi
CornC4_CntAmer_IRR_lo
CornC4_CntAmer_RFD_hi
CornC4_CntAmer_RFD_lo
CornC4_ColEcuaCst_IRR_hi
CornC4_ColEcuaCst_IRR_lo
CornC4_ColEcuaCst_RFD_hi
CornC4_ColEcuaCst_RFD_lo
CornC4_CongoR_IRR_hi
CornC4_CongoR_IRR_lo
CornC4_CongoR_RFD_hi
CornC4_CongoR_RFD_lo
CornC4_DanubeR_IRR_hi
CornC4_DanubeR_IRR_lo
CornC4_DanubeR_RFD_hi
CornC4_DanubeR_RFD_lo
CornC4_DaugavaR_IRR_hi
CornC4_DaugavaR_IRR_lo
CornC4_DaugavaR_RFD_hi
CornC4_DaugavaR_RFD_lo
CornC4_DeadSea_IRR_hi
CornC4_DeadSea_IRR_lo
CornC4_DeadSea_RFD_hi
CornC4_DeadSea_RFD_lo
CornC4_DnieperR_IRR_hi
CornC4_DnieperR_IRR_lo
CornC4_DnieperR_RFD_hi
CornC4_DnieperR_RFD_lo
CornC4_DniesterR_IRR_hi
CornC4_DniesterR_IRR_lo
CornC4_DniesterR_RFD_hi
CornC4_DniesterR_RFD_lo
CornC4_DnkGrmCst_IRR_hi
CornC4_DnkGrmCst_IRR_lo
CornC4_DnkGrmCst_RFD_hi
CornC4_DnkGrmCst_RFD_lo
CornC4_DonR_IRR_hi
CornC4_DonR_IRR_lo
CornC4_DonR_RFD_hi
CornC4_DonR_RFD_lo
CornC4_DouroR_IRR_hi
CornC4_DouroR_IRR_lo
CornC4_DouroR_RFD_hi
CornC4_DouroR_RFD_lo
CornC4_DvinaRN_IRR_hi
CornC4_DvinaRN_IRR_lo
CornC4_DvinaRN_RFD_hi
CornC4_DvinaRN_RFD_lo
CornC4_EbroR_IRR_hi
CornC4_EbroR_IRR_lo
CornC4_EbroR_RFD_hi
CornC4_EbroR_RFD_lo
CornC4_EJrdnSyr_IRR_hi
CornC4_EJrdnSyr_IRR_lo
CornC4_EJrdnSyr_RFD_hi
CornC4_EJrdnSyr_RFD_lo
CornC4_ElbeR_IRR_hi
CornC4_ElbeR_IRR_lo
CornC4_ElbeR_RFD_hi
CornC4_ElbeR_RFD_lo
CornC4_EmsWeserR_IRR_hi
CornC4_EmsWeserR_IRR_lo
CornC4_EmsWeserR_RFD_hi
CornC4_EmsWeserR_RFD_lo
CornC4_FarahrudR_IRR_hi
CornC4_FarahrudR_IRR_lo
CornC4_FarahrudR_RFD_hi
CornC4_FarahrudR_RFD_lo
CornC4_Finland_IRR_hi
CornC4_Finland_IRR_lo
CornC4_Finland_RFD_hi
CornC4_Finland_RFD_lo
CornC4_FlyR_RFD_hi
CornC4_FlyR_RFD_lo
CornC4_FranceCstS_IRR_hi
CornC4_FranceCstS_IRR_lo
CornC4_FranceCstS_RFD_hi
CornC4_FranceCstS_RFD_lo
CornC4_FranceCstW_IRR_hi
CornC4_FranceCstW_IRR_lo
CornC4_FranceCstW_RFD_hi
CornC4_FranceCstW_RFD_lo
CornC4_FraserR_IRR_hi
CornC4_FraserR_IRR_lo
CornC4_FraserR_RFD_hi
CornC4_FraserR_RFD_lo
CornC4_GangesR_IRR_hi
CornC4_GangesR_IRR_lo
CornC4_GangesR_RFD_hi

FruitsTree_MexInt
FruitsTree_MissouriR
FruitsTree_MissppRN
FruitsTree_MissppRS
FruitsTree_MurrayDrlg
FruitsTree_NarmadaR
FruitsTree_NarvaR
FruitsTree_NegroR
FruitsTree_NelsonR
FruitsTree_NemanR
FruitsTree_NevaR
FruitsTree_NewCaledn
FruitsTree_NewZealand
FruitsTree_NigerR
FruitsTree_NileR
FruitsTree_NWTerr
FruitsTree_ObR
FruitsTree_OderR
FruitsTree_OhioR
FruitsTree_OrangeR
FruitsTree_OrinocoR
FruitsTree_PacArctic
FruitsTree_Pampas
FruitsTree_Papaloapan
FruitsTree_PapuaCst
FruitsTree_ParnaibaR
FruitsTree_Patagonia
FruitsTree_PennarR
FruitsTree_PersianGulf
FruitsTree_PeruCst
FruitsTree_Phlppns
FruitsTree_PolandCst
FruitsTree_PoR
FruitsTree_RedSeaE
FruitsTree_RhineR
FruitsTree_RhoneR
FruitsTree_RiftValley
FruitsTree_RioBalsas
FruitsTree_RioGrande
FruitsTree_RioLaPlata
FruitsTree_RioLerma
FruitsTree_RioVerde
FruitsTree_RusCstSE
FruitsTree_SabarmatiR
FruitsTree_Salinas
FruitsTree_Salween
FruitsTree_SAmerCstN
FruitsTree_SAmerCstNE
FruitsTree_SaoFrancR
FruitsTree_ScheldtR
FruitsTree_SChinaSea
FruitsTree_ScndnvN
FruitsTree_Scotland
FruitsTree_SeineR
FruitsTree_SenegalR
FruitsTree_SepikR
FruitsTree_ShebJubR
FruitsTree_SiberiaW
FruitsTree_SinaiP
FruitsTree_SittaungR
FruitsTree_SolomonIsl
FruitsTree_SpainCstSE
FruitsTree_SriLanka
FruitsTree_StLwrncR
FruitsTree_Sulawesi
FruitsTree_Sumatra
FruitsTree_Sweden
FruitsTree_SyrDaryaR
FruitsTree_TagusR
FruitsTree_Taiwan
FruitsTree_TaptiR
FruitsTree_Tarim
FruitsTree_Tasmania
FruitsTree_Tehuantpc
FruitsTree_TennR
FruitsTree_TexasCst
FruitsTree_ThaiGulf
FruitsTree_TiberR
FruitsTree_TigrEuphR
FruitsTree_TocantinsR
FruitsTree_UralR
FruitsTree_UsaColoRN
FruitsTree_UsaColoRS
FruitsTree_UsaCstE
FruitsTree_UsaCstNE
FruitsTree_UsaCstSE
FruitsTree_UsaPacNW
FruitsTree_VietnamCst
FruitsTree_VolgaR
FruitsTree_VoltaR
FruitsTree_WislaR
FruitsTree_XunJiang
FruitsTree_Yangtze
FruitsTree_YeniseiR
FruitsTree_YucatanP
FruitsTree_ZambeziR

CornC4_GangesR_RFD_lo
CornC4_Gironde_IRR_hi
CornC4_Gironde_IRR_lo
CornC4_Gironde_RFD_hi
CornC4_Gironde_RFD_lo
CornC4_Gobi_IRR_hi
CornC4_Gobi_IRR_lo
CornC4_Gobi_RFD_hi
CornC4_Gobi_RFD_lo
CornC4_GodavariR_IRR_hi
CornC4_GodavariR_IRR_lo
CornC4_GodavariR_RFD_hi
CornC4_GodavariR_RFD_lo
CornC4_GreatBasin_IRR_hi
CornC4_GreatBasin_IRR_lo
CornC4_GreatBasin_RFD_hi
CornC4_GreatBasin_RFD_lo
CornC4_GreatLakes_IRR_hi
CornC4_GreatLakes_IRR_lo
CornC4_GreatLakes_RFD_hi
CornC4_GreatLakes_RFD_lo
CornC4_GrijUsuR_IRR_hi
CornC4_GrijUsuR_IRR_lo
CornC4_GrijUsuR_RFD_hi
CornC4_GrijUsuR_RFD_lo
CornC4_GuadalqR_IRR_hi
CornC4_GuadalqR_IRR_lo
CornC4_GuadalqR_RFD_hi
CornC4_GuadalqR_RFD_lo
CornC4_GuadianaR_IRR_hi
CornC4_GuadianaR_IRR_lo
CornC4_GuadianaR_RFD_hi
CornC4_GuadianaR_RFD_lo
CornC4_GuineaGulf_IRR_hi
CornC4_GuineaGulf_IRR_lo
CornC4_GuineaGulf_RFD_hi
CornC4_GuineaGulf_RFD_lo
CornC4_Hainan_IRR_hi
CornC4_Hainan_IRR_lo
CornC4_Hainan_RFD_hi
CornC4_Hainan_RFD_lo
CornC4_HamuMashR_IRR_hi
CornC4_HamuMashR_IRR_lo
CornC4_HamuMashR_RFD_hi
CornC4_HamuMashR_RFD_lo
CornC4_Helmand_IRR_hi
CornC4_Helmand_IRR_lo
CornC4_Helmand_RFD_hi
CornC4_Helmand_RFD_lo
CornC4_Hong_IRR_hi
CornC4_Hong_IRR_lo
CornC4_Hong_RFD_hi
CornC4_Hong_RFD_lo
CornC4_HuangHeR_IRR_hi
CornC4_HuangHeR_IRR_lo
CornC4_HuangHeR_RFD_hi
CornC4_HuangHeR_RFD_lo
CornC4_HudsonBay_IRR_hi
CornC4_HudsonBay_IRR_lo
CornC4_HudsonBay_RFD_hi
CornC4_HudsonBay_RFD_lo
CornC4_IberiaCst_IRR_hi
CornC4_IberiaCst_IRR_lo
CornC4_IberiaCst_RFD_hi
CornC4_IberiaCst_RFD_lo
CornC4_IdnE_IRR_hi
CornC4_IdnE_IRR_lo
CornC4_IdnE_RFD_hi
CornC4_IdnE_RFD_lo
CornC4_IndCstE_IRR_hi
CornC4_IndCstE_IRR_lo
CornC4_IndCstE_RFD_hi
CornC4_IndCstE_RFD_lo
CornC4_IndCstNE_IRR_hi
CornC4_IndCstNE_IRR_lo
CornC4_IndCstNE_RFD_hi
CornC4_IndCstNE_RFD_lo
CornC4_IndCstS_IRR_hi
CornC4_IndCstS_IRR_lo
CornC4_IndCstS_RFD_hi
CornC4_IndCstS_RFD_lo
CornC4_IndCstW_IRR_hi
CornC4_IndCstW_IRR_lo
CornC4_IndCstW_RFD_hi
CornC4_IndCstW_RFD_lo
CornC4_IndusR_IRR_hi
CornC4_IndusR_IRR_lo
CornC4_IndusR_RFD_hi
CornC4_IndusR_RFD_lo
CornC4_Iran_IRR_hi
CornC4_Iran_IRR_lo
CornC4_Iran_RFD_hi
CornC4_Iran_RFD_lo
CornC4_IrianJaya_IRR_hi
CornC4_IrianJaya_IRR_lo
CornC4_IrianJaya_RFD_hi

FruitsTree_ZiyaHe
gas
gas to liquids
GrasslandFires_AdnNicIsl
GrasslandFires_AdrBlkSea
GrasslandFires_AfrCstE
GrasslandFires_AfrCstNE
GrasslandFires_AfrCstNW
GrasslandFires_AfrCstS
GrasslandFires_AfrCstSE
GrasslandFires_AfrCstSSW
GrasslandFires_AfrCstSW
GrasslandFires_AfrCstW
GrasslandFires_AfrIntN
GrasslandFires_AfrIntS
GrasslandFires_AmazonR
GrasslandFires_AmuDaryaR
GrasslandFires_AmurR
GrasslandFires_AngolaCst
GrasslandFires_ArabianP
GrasslandFires_ArabianSea
GrasslandFires_ArcticIsl
GrasslandFires_ArgColoR
GrasslandFires_ArgCstN
GrasslandFires_ArgCstS
GrasslandFires_ArkWhtRedR
GrasslandFires_AusCstE
GrasslandFires_AusCstN
GrasslandFires_AusCstS
GrasslandFires_AusCstW
GrasslandFires_AusInt
GrasslandFires_BalticSea
GrasslandFires_BarentsSea
GrasslandFires_BengalBay
GrasslandFires_BengalW
GrasslandFires_BlackSeaN
GrasslandFires_BlackSeaS
GrasslandFires_BoHai
GrasslandFires_BorneoCstN
GrasslandFires_BrahmaniR
GrasslandFires_BrzCstE
GrasslandFires_BrzCstN
GrasslandFires_BrzCstS
GrasslandFires_California
GrasslandFires_CanAtl
GrasslandFires_Caribbean
GrasslandFires_CaspianE
GrasslandFires_CaspianNE
GrasslandFires_CaspianSW
GrasslandFires_CauveryR
GrasslandFires_ChaoPhrR
GrasslandFires_ChileCstN
GrasslandFires_ChileCstS
GrasslandFires_ChinaCst
GrasslandFires_ChurchillR
GrasslandFires_CntAmer
GrasslandFires_ColEcuaCst
GrasslandFires_CongoR
GrasslandFires_DanubeR
GrasslandFires_DaugavaR
GrasslandFires_DeadSea
GrasslandFires_DnieperR
GrasslandFires_DniesterR
GrasslandFires_DnkGrmCst
GrasslandFires_DonR
GrasslandFires_DouroR
GrasslandFires_DvinaRN
GrasslandFires_EbroR
GrasslandFires_EJrdnSyr
GrasslandFires_ElbeR
GrasslandFires_EmsWeserR
GrasslandFires_EngWales
GrasslandFires_FarahrudR
GrasslandFires_Finland
GrasslandFires_FlyR
GrasslandFires_FranceCstS
GrasslandFires_FranceCstW
GrasslandFires_FraserR
GrasslandFires_GangesR
GrasslandFires_Gironde
GrasslandFires_Gobi
GrasslandFires_GodavariR
GrasslandFires_GreatBasin
GrasslandFires_GreatLakes
GrasslandFires_GrijUsuR
GrasslandFires_GuadalqR
GrasslandFires_GuadianaR
GrasslandFires_GuineaGulf
GrasslandFires_Hainan
GrasslandFires_HamuMashR
GrasslandFires_Hawaii
GrasslandFires_Helmand
GrasslandFires_Hong
GrasslandFires_HuangHeR
GrasslandFires_HudsonBay
GrasslandFires_IberiaCst
CornC4_IrianJaya_RFD_lo
CornC4_IrrawaddyR_IRR_hi
CornC4_IrrawaddyR_IRR_lo
CornC4_IrrawaddyR_RFD_hi
CornC4_IrrawaddyR_RFD_lo
CornC4_ItalyCstE_IRR_hi
CornC4_ItalyCstE_IRR_lo
CornC4_ItalyCstE_RFD_hi
CornC4_ItalyCstE_RFD_lo
CornC4_ItalyCstW_IRR_hi
CornC4_ItalyCstW_IRR_lo
CornC4_ItalyCstW_RFD_hi
CornC4_ItalyCstW_RFD_lo
CornC4_Japan_IRR_hi
CornC4_Japan_IRR_lo
CornC4_Japan_RFD_hi
CornC4_Japan_RFD_lo
CornC4_JavaTimor_IRR_hi
CornC4_JavaTimor_IRR_lo
CornC4_JavaTimor_RFD_hi
CornC4_JavaTimor_RFD_lo
CornC4_Kalimantan_IRR_hi
CornC4_Kalimantan_IRR_lo
CornC4_Kalimantan_RFD_hi
CornC4_Kalimantan_RFD_lo
CornC4_Korea_IRR_hi
CornC4_Korea_IRR_lo
CornC4_Korea_RFD_hi
CornC4_Korea_RFD_lo
CornC4_KrishnaR_IRR_hi
CornC4_KrishnaR_IRR_lo
CornC4_KrishnaR_RFD_hi
CornC4_KrishnaR_RFD_lo
CornC4_LaPuna_IRR_hi
CornC4_LaPuna_IRR_lo
CornC4_LaPuna_RFD_hi
CornC4_LaPuna_RFD_lo
CornC4_LBalkash_IRR_hi
CornC4_LBalkash_IRR_lo
CornC4_LBalkash_RFD_hi
CornC4_LBalkash_RFD_lo
CornC4_LChad_IRR_hi
CornC4_LChad_IRR_lo
CornC4_LChad_RFD_hi
CornC4_LChad_RFD_lo
CornC4_LenaR_RFD_hi
CornC4_LenaR_RFD_lo
CornC4_LimpopoR_IRR_hi
CornC4_LimpopoR_IRR_lo
CornC4_LimpopoR_RFD_hi
CornC4_LimpopoR_RFD_lo
CornC4_LoireR_IRR_hi
CornC4_LoireR_IRR_lo
CornC4_LoireR_RFD_hi
CornC4_LoireR_RFD_lo
CornC4_Mackenzie_IRR_hi
CornC4_Mackenzie_IRR_lo
CornC4_Mackenzie_RFD_hi
CornC4_Mackenzie_RFD_lo
CornC4_Madagascar_RFD_hi
CornC4_Madagascar_RFD_lo
CornC4_MagdalenaR_IRR_hi
CornC4_MagdalenaR_IRR_lo
CornC4_MagdalenaR_RFD_hi
CornC4_MagdalenaR_RFD_lo
CornC4_MahanadiR_IRR_hi
CornC4_MahanadiR_IRR_lo
CornC4_MahanadiR_RFD_hi
CornC4_MahanadiR_RFD_lo
CornC4_MahiR_IRR_hi
CornC4_MahiR_IRR_lo
CornC4_MahiR_RFD_hi
CornC4_MahiR_RFD_lo
CornC4_MalaysiaP_IRR_hi
CornC4_MalaysiaP_IRR_lo
CornC4_MalaysiaP_RFD_hi
CornC4_MalaysiaP_RFD_lo
CornC4_MarChiq_IRR_hi
CornC4_MarChiq_IRR_lo
CornC4_MarChiq_RFD_hi
CornC4_MarChiq_RFD_lo
CornC4_MeditE_IRR_hi
CornC4_MeditE_IRR_lo
CornC4_MeditE_RFD_hi
CornC4_MeditE_RFD_lo
CornC4_MeditIsl_IRR_hi
CornC4_MeditIsl_IRR_lo
CornC4_MeditIsl_RFD_hi
CornC4_MeditIsl_RFD_lo
CornC4_MeditS_IRR_hi
CornC4_MeditS_IRR_lo
CornC4_MeditS_RFD_hi
CornC4_MeditS_RFD_lo
CornC4_Mekong_IRR_hi
CornC4_Mekong_IRR_lo
CornC4_Mekong_RFD_hi

GrasslandFires_Iceland
GrasslandFires_IdnE
GrasslandFires_IndCstE
GrasslandFires_IndCstNE
GrasslandFires_IndCstS
GrasslandFires_IndCstW
GrasslandFires_IndusR
GrasslandFires_Iran
GrasslandFires_Ireland
GrasslandFires_IrianJaya
GrasslandFires_IrrawaddyR
GrasslandFires_ItalyCstE
GrasslandFires_ItalyCstW
GrasslandFires_Japan
GrasslandFires_JavaTimor
GrasslandFires_Kalimantan
GrasslandFires_KaraSea
GrasslandFires_Korea
GrasslandFires_KrishnaR
GrasslandFires_LaPuna
GrasslandFires_LBalkash
GrasslandFires_LChad
GrasslandFires_LenaR
GrasslandFires_LimpopoR
GrasslandFires_LoireR
GrasslandFires_Mackenzie
GrasslandFires_Madagascar
GrasslandFires_MagdalenaR
GrasslandFires_MahanadiR
GrasslandFires_MahiR
GrasslandFires_MalaysiaP
GrasslandFires_MarChiq
GrasslandFires_MeditE
GrasslandFires_MeditIsl
GrasslandFires_MeditS
GrasslandFires_Mekong
GrasslandFires_MexBaja
GrasslandFires_MexCstNW
GrasslandFires_MexCstW
GrasslandFires_MexGulf
GrasslandFires_MexInt
GrasslandFires_MissouriR
GrasslandFires_MissppRN
GrasslandFires_MissppRS
GrasslandFires_MurrayDrlg
GrasslandFires_NarmadaR
GrasslandFires_NarvaR
GrasslandFires_NegroR
GrasslandFires_NelsonR
GrasslandFires_NemanR
GrasslandFires_NevaR
GrasslandFires_NewCaledn
GrasslandFires_NewZealand
GrasslandFires_NigerR
GrasslandFires_NileR
GrasslandFires_NWTerr
GrasslandFires_ObR
GrasslandFires_OderR
GrasslandFires_OhioR
GrasslandFires_OrangeR
GrasslandFires_OrinocoR
GrasslandFires_PacArctic
GrasslandFires_Pampas
GrasslandFires_Papaloapan
GrasslandFires_PapuaCst
GrasslandFires_ParnaibaR
GrasslandFires_Patagonia
GrasslandFires_PennarR
GrasslandFires_PersianGulf
GrasslandFires_PeruCst
GrasslandFires_Phlppns
GrasslandFires_PolandCst
GrasslandFires_PoR
GrasslandFires_RedSeaE
GrasslandFires_RhineR
GrasslandFires_RhoneR
GrasslandFires_RiftValley
GrasslandFires_RioBalsas
GrasslandFires_RioGrande
GrasslandFires_RioLaPlata
GrasslandFires_RioLerma
GrasslandFires_RioVerde
GrasslandFires_RusCstSE
GrasslandFires_SabarmatiR
GrasslandFires_Salinas
GrasslandFires_Salween
GrasslandFires_SAmerCstN
GrasslandFires_SAmerCstNE
GrasslandFires_SaoFrancR
GrasslandFires_ScheldtR
GrasslandFires_SChinaSea
GrasslandFires_ScndnvN
GrasslandFires_Scotland
GrasslandFires_SeineR
GrasslandFires_SenegalR
GrasslandFires_SepikR
CornC4_Mekong_RFD_lo
CornC4_MexBaja_IRR_hi
CornC4_MexBaja_IRR_lo
CornC4_MexBaja_RFD_hi
CornC4_MexBaja_RFD_lo
CornC4_MexCstNW_IRR_hi
CornC4_MexCstNW_IRR_lo
CornC4_MexCstNW_RFD_hi
CornC4_MexCstNW_RFD_lo
CornC4_MexCstW_IRR_hi
CornC4_MexCstW_IRR_lo
CornC4_MexCstW_RFD_hi
CornC4_MexCstW_RFD_lo
CornC4_MexGulf_IRR_hi
CornC4_MexGulf_IRR_lo
CornC4_MexGulf_RFD_hi
CornC4_MexGulf_RFD_lo
CornC4_MexInt_IRR_hi
CornC4_MexInt_IRR_lo
CornC4_MexInt_RFD_hi
CornC4_MexInt_RFD_lo
CornC4_MissouriR_IRR_hi
CornC4_MissouriR_IRR_lo
CornC4_MissouriR_RFD_hi
CornC4_MissouriR_RFD_lo
CornC4_MissppRN_IRR_hi
CornC4_MissppRN_IRR_lo
CornC4_MissppRN_RFD_hi
CornC4_MissppRN_RFD_lo
CornC4_MissppRS_IRR_hi
CornC4_MissppRS_IRR_lo
CornC4_MissppRS_RFD_hi
CornC4_MissppRS_RFD_lo
CornC4_MurrayDrlg_IRR_hi
CornC4_MurrayDrlg_IRR_lo
CornC4_MurrayDrlg_RFD_hi
CornC4_MurrayDrlg_RFD_lo
CornC4_NarmadaR_IRR_hi
CornC4_NarmadaR_IRR_lo
CornC4_NarmadaR_RFD_hi
CornC4_NarmadaR_RFD_lo
CornC4_NarvaR_IRR_hi
CornC4_NarvaR_IRR_lo
CornC4_NarvaR_RFD_hi
CornC4_NarvaR_RFD_lo
CornC4_NegroR_IRR_hi
CornC4_NegroR_IRR_lo
CornC4_NegroR_RFD_hi
CornC4_NegroR_RFD_lo
CornC4_NelsonR_IRR_hi
CornC4_NelsonR_IRR_lo
CornC4_NelsonR_RFD_hi
CornC4_NelsonR_RFD_lo
CornC4_NemanR_IRR_hi
CornC4_NemanR_IRR_lo
CornC4_NemanR_RFD_hi
CornC4_NemanR_RFD_lo
CornC4_NevaR_IRR_hi
CornC4_NevaR_IRR_lo
CornC4_NevaR_RFD_hi
CornC4_NevaR_RFD_lo
CornC4_NewCaledn_RFD_hi
CornC4_NewCaledn_RFD_lo
CornC4_NewZealand_IRR_hi
CornC4_NewZealand_IRR_lo
CornC4_NewZealand_RFD_hi
CornC4_NewZealand_RFD_lo
CornC4_NigerR_IRR_hi
CornC4_NigerR_IRR_lo
CornC4_NigerR_RFD_hi
CornC4_NigerR_RFD_lo
CornC4_NileR_IRR_hi
CornC4_NileR_IRR_lo
CornC4_NileR_RFD_hi
CornC4_NileR_RFD_lo
CornC4_NWTerr_IRR_hi
CornC4_NWTerr_IRR_lo
CornC4_NWTerr_RFD_hi
CornC4_NWTerr_RFD_lo
CornC4_ObR_IRR_hi
CornC4_ObR_IRR_lo
CornC4_ObR_RFD_hi
CornC4_ObR_RFD_lo
CornC4_OderR_IRR_hi
CornC4_OderR_IRR_lo
CornC4_OderR_RFD_hi
CornC4_OderR_RFD_lo
CornC4_OhioR_IRR_hi
CornC4_OhioR_IRR_lo
CornC4_OhioR_RFD_hi
CornC4_OhioR_RFD_lo
CornC4_OrangeR_IRR_hi
CornC4_OrangeR_IRR_lo
CornC4_OrangeR_RFD_hi
CornC4_OrangeR_RFD_lo
CornC4_OrinocoR_IRR_hi

GrasslandFires_ShebJubR
GrasslandFires_SiberiaN
GrasslandFires_SiberiaW
GrasslandFires_SittaungR
GrasslandFires_SolomonIsl
GrasslandFires_SpainCstSE
GrasslandFires_SriLanka
GrasslandFires_StLwrncR
GrasslandFires_Sulawesi
GrasslandFires_Sumatra
GrasslandFires_Sweden
GrasslandFires_SyrDaryaR
GrasslandFires_TagusR
GrasslandFires_Taiwan
GrasslandFires_TaptiR
GrasslandFires_Tarim
GrasslandFires_Tasmania
GrasslandFires_Tehuantpc
GrasslandFires_TennR
GrasslandFires_TexasCst
GrasslandFires_ThaiGulf
GrasslandFires_TiberR
GrasslandFires_Tibet
GrasslandFires_TigrEuphR
GrasslandFires_TocantinsR
GrasslandFires_UralR
GrasslandFires_UsaColoRN
GrasslandFires_UsaColoRS
GrasslandFires_UsaCstE
GrasslandFires_UsaCstNE
GrasslandFires_UsaCstSE
GrasslandFires_UsaPacNW
GrasslandFires_VietnamCst
GrasslandFires_VolgaR
GrasslandFires_VoltaR
GrasslandFires_WislaR
GrasslandFires_XunJiang
GrasslandFires_Yangtze
GrasslandFires_YeniseiR
GrasslandFires_YucatanP
GrasslandFires_ZambeziR
GrasslandFires_ZiyaHe
HCFC_22_Prod
Heavy truck
International Aviation
International Ship
landfills
Large Car and Truck
Legumes_AdrBlkSea
Legumes_AfrCstE
Legumes_AfrCstNE
Legumes_AfrCstNW
Legumes_AfrCstS
Legumes_AfrCstSE
Legumes_AfrCstSSW
Legumes_AfrCstSW
Legumes_AfrCstW
Legumes_AfrIntN
Legumes_AfrIntS
Legumes_AmazonR
Legumes_AmuDaryaR
Legumes_AmurR
Legumes_AngolaCst
Legumes_ArabianP
Legumes_ArabianSea
Legumes_ArgColoR
Legumes_ArgCstN
Legumes_ArgCstS
Legumes_ArkWhtRedR
Legumes_AusCstE
Legumes_AusCstN
Legumes_AusCstS
Legumes_AusCstW
Legumes_AusInt
Legumes_BalticSea
Legumes_BarentsSea
Legumes_BengalBay
Legumes_BengalW
Legumes_BlackSeaN
Legumes_BlackSeaS
Legumes_BoHai
Legumes_BorneoCstN
Legumes_BrahmaniR
Legumes_BrzCstE
Legumes_BrzCstN
Legumes_BrzCstS
Legumes_California
Legumes_CanAtl
Legumes_Caribbean
Legumes_CaspianE
Legumes_CaspianNE
Legumes_CaspianSW
Legumes_CauveryR
Legumes_ChaoPhrR
Legumes_ChileCstN
Legumes_ChileCstS
CornC4_OrinocoR_IRR_lo
CornC4_OrinocoR_RFD_hi
CornC4_OrinocoR_RFD_lo
CornC4_PacArctic_IRR_hi
CornC4_PacArctic_IRR_lo
CornC4_PacArctic_RFD_hi
CornC4_PacArctic_RFD_lo
CornC4_Pampas_IRR_hi
CornC4_Pampas_IRR_lo
CornC4_Pampas_RFD_hi
CornC4_Pampas_RFD_lo
CornC4_Papaloapan_IRR_hi
CornC4_Papaloapan_IRR_lo
CornC4_Papaloapan_RFD_hi
CornC4_Papaloapan_RFD_lo
CornC4_PapuaCst_RFD_hi
CornC4_PapuaCst_RFD_lo
CornC4_ParnaibaR_IRR_hi
CornC4_ParnaibaR_IRR_lo
CornC4_ParnaibaR_RFD_hi
CornC4_ParnaibaR_RFD_lo
CornC4_PennarR_IRR_hi
CornC4_PennarR_IRR_lo
CornC4_PennarR_RFD_hi
CornC4_PennarR_RFD_lo
CornC4_PersianGulf_IRR_hi
CornC4_PersianGulf_IRR_lo
CornC4_PersianGulf_RFD_hi
CornC4_PersianGulf_RFD_lo
CornC4_PeruCst_IRR_hi
CornC4_PeruCst_IRR_lo
CornC4_PeruCst_RFD_hi
CornC4_PeruCst_RFD_lo
CornC4_Phlppns_RFD_hi
CornC4_Phlppns_RFD_lo
CornC4_PolandCst_IRR_hi
CornC4_PolandCst_IRR_lo
CornC4_PolandCst_RFD_hi
CornC4_PolandCst_RFD_lo
CornC4_PoR_IRR_hi
CornC4_PoR_IRR_lo
CornC4_PoR_RFD_hi
CornC4_PoR_RFD_lo
CornC4_RedSeaE_IRR_hi
CornC4_RedSeaE_IRR_lo
CornC4_RedSeaE_RFD_hi
CornC4_RedSeaE_RFD_lo
CornC4_RhineR_IRR_hi
CornC4_RhineR_IRR_lo
CornC4_RhineR_RFD_hi
CornC4_RhineR_RFD_lo
CornC4_RhoneR_IRR_hi
CornC4_RhoneR_IRR_lo
CornC4_RhoneR_RFD_hi
CornC4_RhoneR_RFD_lo
CornC4_RiftValley_IRR_hi
CornC4_RiftValley_IRR_lo
CornC4_RiftValley_RFD_hi
CornC4_RiftValley_RFD_lo
CornC4_RioBalsas_IRR_hi
CornC4_RioBalsas_IRR_lo
CornC4_RioBalsas_RFD_hi
CornC4_RioBalsas_RFD_lo
CornC4_RioGrande_IRR_hi
CornC4_RioGrande_IRR_lo
CornC4_RioGrande_RFD_hi
CornC4_RioGrande_RFD_lo
CornC4_RioLaPlata_IRR_hi
CornC4_RioLaPlata_IRR_lo
CornC4_RioLaPlata_RFD_hi
CornC4_RioLaPlata_RFD_lo
CornC4_RioLerma_IRR_hi
CornC4_RioLerma_IRR_lo
CornC4_RioLerma_RFD_hi
CornC4_RioLerma_RFD_lo
CornC4_RioVerde_IRR_hi
CornC4_RioVerde_IRR_lo
CornC4_RioVerde_RFD_hi
CornC4_RioVerde_RFD_lo
CornC4_RusCstSE_IRR_hi
CornC4_RusCstSE_IRR_lo
CornC4_RusCstSE_RFD_hi
CornC4_RusCstSE_RFD_lo
CornC4_SabarmatiR_IRR_hi
CornC4_SabarmatiR_IRR_lo
CornC4_SabarmatiR_RFD_hi
CornC4_SabarmatiR_RFD_lo
CornC4_Salinas_IRR_hi
CornC4_Salinas_IRR_lo
CornC4_Salinas_RFD_hi
CornC4_Salinas_RFD_lo
CornC4_Salween_IRR_hi
CornC4_Salween_IRR_lo
CornC4_Salween_RFD_hi
CornC4_Salween_RFD_lo
CornC4_SAmerCstN_IRR_hi

Legumes_ChinaCst
Legumes_CntAmer
Legumes_ColEcuaCst
Legumes_CongoR
Legumes_DanubeR
Legumes_DaugavaR
Legumes_DeadSea
Legumes_DnieperR
Legumes_DniesterR
Legumes_DnkGrmCst
Legumes_DonR
Legumes_DouroR
Legumes_DvinaRN
Legumes_EbroR
Legumes_EJrdnSyr
Legumes_ElbeR
Legumes_EmsWeserR
Legumes_EngWales
Legumes_FarahrudR
Legumes_Finland
Legumes_FlyR
Legumes_FranceCstS
Legumes_FranceCstW
Legumes_GangesR
Legumes_Gironde
Legumes_Gobi
Legumes_GodavariR
Legumes_GreatBasin
Legumes_GreatLakes
Legumes_GrijUsuR
Legumes_GuadalqR
Legumes_GuadianaR
Legumes_GuineaGulf
Legumes_Hainan
Legumes_HamuMashR
Legumes_Helmand
Legumes_Hong
Legumes_HuangHeR
Legumes_HudsonBay
Legumes_IberiaCst
Legumes_IdnE
Legumes_IndCstE
Legumes_IndCstNE
Legumes_IndCstS
Legumes_IndCstW
Legumes_IndusR
Legumes_Iran
Legumes_Ireland
Legumes_IrianJaya
Legumes_IrrawaddyR
Legumes_ItalyCstE
Legumes_ItalyCstW
Legumes_Japan
Legumes_JavaTimor
Legumes_Kalimantan
Legumes_Korea
Legumes_KrishnaR
Legumes_LaPuna
Legumes_LBalkash
Legumes_LChad
Legumes_LenaR
Legumes_LimpopoR
Legumes_LoireR
Legumes_Mackenzie
Legumes_Madagascar
Legumes_MagdalenaR
Legumes_MahanadiR
Legumes_MahiR
Legumes_MalaysiaP
Legumes_MarChiq
Legumes_MeditE
Legumes_MeditIsl
Legumes_MeditS
Legumes_Mekong
Legumes_MexBaja
Legumes_MexCstNW
Legumes_MexCstW
Legumes_MexGulf
Legumes_MexInt
Legumes_MissouriR
Legumes_MissppRN
Legumes_MissppRS
Legumes_MurrayDrlg
Legumes_NarmadaR
Legumes_NarvaR
Legumes_NegroR
Legumes_NelsonR
Legumes_NemanR
Legumes_NevaR
Legumes_NewCaledn
Legumes_NewZealand
Legumes_NigerR
Legumes_NileR
Legumes_NWTerr
Legumes_ObR
Legumes_OderR
CornC4_SAmerCstN_IRR_lo
CornC4_SAmerCstN_RFD_hi
CornC4_SAmerCstN_RFD_lo
CornC4_SAmerCstNE_IRR_hi
CornC4_SAmerCstNE_IRR_lo
CornC4_SAmerCstNE_RFD_hi
CornC4_SAmerCstNE_RFD_lo
CornC4_SaoFrancR_IRR_hi
CornC4_SaoFrancR_IRR_lo
CornC4_SaoFrancR_RFD_hi
CornC4_SaoFrancR_RFD_lo
CornC4_ScheldtR_IRR_hi
CornC4_ScheldtR_IRR_lo
CornC4_ScheldtR_RFD_hi
CornC4_ScheldtR_RFD_lo
CornC4_SChinaSea_IRR_hi
CornC4_SChinaSea_IRR_lo
CornC4_SChinaSea_RFD_hi
CornC4_SChinaSea_RFD_lo
CornC4_ScndnvN_RFD_hi
CornC4_ScndnvN_RFD_lo
CornC4_SeineR_IRR_hi
CornC4_SeineR_IRR_lo
CornC4_SeineR_RFD_hi
CornC4_SeineR_RFD_lo
CornC4_SenegalR_IRR_hi
CornC4_SenegalR_IRR_lo
CornC4_SenegalR_RFD_hi
CornC4_SenegalR_RFD_lo
CornC4_SepikR_RFD_hi
CornC4_SepikR_RFD_lo
CornC4_ShebJubR_IRR_hi
CornC4_ShebJubR_IRR_lo
CornC4_ShebJubR_RFD_hi
CornC4_ShebJubR_RFD_lo
CornC4_SiberiaW_RFD_hi
CornC4_SiberiaW_RFD_lo
CornC4_SinaiP_IRR_hi
CornC4_SinaiP_IRR_lo
CornC4_SinaiP_RFD_hi
CornC4_SinaiP_RFD_lo
CornC4_SittaungR_IRR_hi
CornC4_SittaungR_IRR_lo
CornC4_SittaungR_RFD_hi
CornC4_SittaungR_RFD_lo
CornC4_SpainCstSE_IRR_hi
CornC4_SpainCstSE_IRR_lo
CornC4_SpainCstSE_RFD_hi
CornC4_SpainCstSE_RFD_lo
CornC4_SriLanka_RFD_hi
CornC4_SriLanka_RFD_lo
CornC4_StLwrncR_IRR_hi
CornC4_StLwrncR_IRR_lo
CornC4_StLwrncR_RFD_hi
CornC4_StLwrncR_RFD_lo
CornC4_Sulawesi_IRR_hi
CornC4_Sulawesi_IRR_lo
CornC4_Sulawesi_RFD_hi
CornC4_Sulawesi_RFD_lo
CornC4_Sumatra_IRR_hi
CornC4_Sumatra_IRR_lo
CornC4_Sumatra_RFD_hi
CornC4_Sumatra_RFD_lo
CornC4_Sweden_RFD_hi
CornC4_Sweden_RFD_lo
CornC4_SyrDaryaR_IRR_hi
CornC4_SyrDaryaR_IRR_lo
CornC4_SyrDaryaR_RFD_hi
CornC4_SyrDaryaR_RFD_lo
CornC4_TagusR_IRR_hi
CornC4_TagusR_IRR_lo
CornC4_TagusR_RFD_hi
CornC4_TagusR_RFD_lo
CornC4_Taiwan_RFD_hi
CornC4_Taiwan_RFD_lo
CornC4_TaptiR_IRR_hi
CornC4_TaptiR_IRR_lo
CornC4_TaptiR_RFD_hi
CornC4_TaptiR_RFD_lo
CornC4_Tarim_IRR_hi
CornC4_Tarim_IRR_lo
CornC4_Tarim_RFD_hi
CornC4_Tarim_RFD_lo
CornC4_Tasmania_IRR_hi
CornC4_Tasmania_IRR_lo
CornC4_Tehuantpc_IRR_hi
CornC4_Tehuantpc_IRR_lo
CornC4_Tehuantpc_RFD_hi
CornC4_Tehuantpc_RFD_lo
CornC4_TennR_IRR_hi
CornC4_TennR_IRR_lo
CornC4_TennR_RFD_hi
CornC4_TennR_RFD_lo
CornC4_TexasCst_IRR_hi
CornC4_TexasCst_IRR_lo
CornC4_TexasCst_RFD_hi

Legumes_OhioR
Legumes_OrangeR
Legumes_OrinocoR
Legumes_Pampas
Legumes_Papaloapan
Legumes_PapuaCst
Legumes_ParnaibaR
Legumes_PennarR
Legumes_PersianGulf
Legumes_PeruCst
Legumes_Phlppns
Legumes_PolandCst
Legumes_PoR
Legumes_RedSeaE
Legumes_RhineR
Legumes_RhoneR
Legumes_RiftValley
Legumes_RioBalsas
Legumes_RioGrande
Legumes_RioLaPlata
Legumes_RioLerma
Legumes_RioVerde
Legumes_RusCstSE
Legumes_SabarmatiR
Legumes_Salinas
Legumes_Salween
Legumes_SAmerCstN
Legumes_SAmerCstNE
Legumes_SaoFrancR
Legumes_ScheldtR
Legumes_SChinaSea
Legumes_ScndnvN
Legumes_Scotland
Legumes_SeineR
Legumes_SenegalR
Legumes_SepikR
Legumes_ShebJubR
Legumes_SinaiP
Legumes_SittaungR
Legumes_SolomonIsl
Legumes_SpainCstSE
Legumes_SriLanka
Legumes_StLwrncR
Legumes_Sulawesi
Legumes_Sumatra
Legumes_Sweden
Legumes_SyrDaryaR
Legumes_TagusR
Legumes_Taiwan
Legumes_TaptiR
Legumes_Tarim
Legumes_Tasmania
Legumes_Tehuantpc
Legumes_TennR
Legumes_TexasCst
Legumes_ThaiGulf
Legumes_TiberR
Legumes_TigrEuphR
Legumes_TocantinsR
Legumes_UralR
Legumes_UsaColoRN
Legumes_UsaColoRS
Legumes_UsaCstE
Legumes_UsaCstNE
Legumes_UsaCstSE
Legumes_UsaPacNW
Legumes_VietnamCst
Legumes_VolgaR
Legumes_VoltaR
Legumes_WislaR
Legumes_XunJiang
Legumes_Yangtze
Legumes_YeniseiR
Legumes_YucatanP
Legumes_ZambeziR
Legumes_ZiyaHe
Light truck
Medium truck
Mini Car
MiscCrop_AdrBlkSea
MiscCrop_AfrCstE
MiscCrop_AfrCstNE
MiscCrop_AfrCstNW
MiscCrop_AfrCstS
MiscCrop_AfrCstSE
MiscCrop_AfrCstSSW
MiscCrop_AfrCstW
MiscCrop_AfrIntN
MiscCrop_AfrIntS
MiscCrop_AmazonR
MiscCrop_AmuDaryaR
MiscCrop_AmurR
MiscCrop_AngolaCst
MiscCrop_ArabianP
MiscCrop_ArabianSea
MiscCrop_ArgColoR
CornC4_TexasCst_RFD_lo
CornC4_ThaiGulf_IRR_hi
CornC4_ThaiGulf_IRR_lo
CornC4_ThaiGulf_RFD_hi
CornC4_ThaiGulf_RFD_lo
CornC4_TiberR_IRR_hi
CornC4_TiberR_IRR_lo
CornC4_TiberR_RFD_hi
CornC4_TiberR_RFD_lo
CornC4_TigrEuphR_IRR_hi
CornC4_TigrEuphR_IRR_lo
CornC4_TigrEuphR_RFD_hi
CornC4_TigrEuphR_RFD_lo
CornC4_TocantinsR_IRR_hi
CornC4_TocantinsR_IRR_lo
CornC4_TocantinsR_RFD_hi
CornC4_TocantinsR_RFD_lo
CornC4_UralR_IRR_hi
CornC4_UralR_IRR_lo
CornC4_UralR_RFD_hi
CornC4_UralR_RFD_lo
CornC4_UsaColoRN_IRR_hi
CornC4_UsaColoRN_IRR_lo
CornC4_UsaColoRN_RFD_hi
CornC4_UsaColoRN_RFD_lo
CornC4_UsaColoRS_IRR_hi
CornC4_UsaColoRS_IRR_lo
CornC4_UsaColoRS_RFD_hi
CornC4_UsaColoRS_RFD_lo
CornC4_UsaCstE_IRR_hi
CornC4_UsaCstE_IRR_lo
CornC4_UsaCstE_RFD_hi
CornC4_UsaCstE_RFD_lo
CornC4_UsaCstNE_IRR_hi
CornC4_UsaCstNE_IRR_lo
CornC4_UsaCstNE_RFD_hi
CornC4_UsaCstNE_RFD_lo
CornC4_UsaCstSE_IRR_hi
CornC4_UsaCstSE_IRR_lo
CornC4_UsaCstSE_RFD_hi
CornC4_UsaCstSE_RFD_lo
CornC4_UsaPacNW_IRR_hi
CornC4_UsaPacNW_IRR_lo
CornC4_UsaPacNW_RFD_hi
CornC4_UsaPacNW_RFD_lo
CornC4_VietnamCst_IRR_hi
CornC4_VietnamCst_IRR_lo
CornC4_VietnamCst_RFD_hi
CornC4_VietnamCst_RFD_lo
CornC4_VolgaR_IRR_hi
CornC4_VolgaR_IRR_lo
CornC4_VolgaR_RFD_hi
CornC4_VolgaR_RFD_lo
CornC4_VoltaR_IRR_hi
CornC4_VoltaR_IRR_lo
CornC4_VoltaR_RFD_hi
CornC4_VoltaR_RFD_lo
CornC4_WislaR_IRR_hi
CornC4_WislaR_IRR_lo
CornC4_WislaR_RFD_hi
CornC4_WislaR_RFD_lo
CornC4_XunJiang_IRR_hi
CornC4_XunJiang_IRR_lo
CornC4_XunJiang_RFD_hi
CornC4_XunJiang_RFD_lo
CornC4_Yangtze_IRR_hi
CornC4_Yangtze_IRR_lo
CornC4_Yangtze_RFD_hi
CornC4_Yangtze_RFD_lo
CornC4_YeniseiR_IRR_hi
CornC4_YeniseiR_IRR_lo
CornC4_YeniseiR_RFD_hi
CornC4_YeniseiR_RFD_lo
CornC4_YucatanP_IRR_hi
CornC4_YucatanP_IRR_lo
CornC4_YucatanP_RFD_hi
CornC4_YucatanP_RFD_lo
CornC4_ZambeziR_IRR_hi
CornC4_ZambeziR_IRR_lo
CornC4_ZambeziR_RFD_hi
CornC4_ZambeziR_RFD_lo
CornC4_ZiyaHe_IRR_hi
CornC4_ZiyaHe_IRR_lo
CornC4_ZiyaHe_RFD_hi
CornC4_ZiyaHe_RFD_lo
Deforest_AdrBlkSea
Deforest_AfrCstE
Deforest_AfrCstS
Deforest_AfrCstSE
Deforest_AfrCstW
Deforest_AfrIntS
Deforest_AmazonR
Deforest_AmuDaryaR
Deforest_AmurR
Deforest_AngolaCst
Deforest_ArgColoR

MiscCrop_ArgCstN
MiscCrop_ArgCstS
MiscCrop_ArkWhtRedR
MiscCrop_AusCstE
MiscCrop_AusCstN
MiscCrop_AusCstS
MiscCrop_AusCstW
MiscCrop_AusInt
MiscCrop_BalticSea
MiscCrop_BengalBay
MiscCrop_BengalW
MiscCrop_BlackSeaN
MiscCrop_BlackSeaS
MiscCrop_BoHai
MiscCrop_BorneoCstN
MiscCrop_BrahmaniR
MiscCrop_BrzCstE
MiscCrop_BrzCstN
MiscCrop_BrzCstS
MiscCrop_California
MiscCrop_CanAtl
MiscCrop_Caribbean
MiscCrop_CaspianE
MiscCrop_CaspianNE
MiscCrop_CaspianSW
MiscCrop_CauveryR
MiscCrop_ChaoPhrR
MiscCrop_ChileCstN
MiscCrop_ChileCstS
MiscCrop_ChinaCst
MiscCrop_CntAmer
MiscCrop_ColEcuaCst
MiscCrop_CongoR
MiscCrop_DanubeR
MiscCrop_DaugavaR
MiscCrop_DeadSea
MiscCrop_DnieperR
MiscCrop_DniesterR
MiscCrop_DnkGrmCst
MiscCrop_DonR
MiscCrop_DouroR
MiscCrop_DvinaRN
MiscCrop_EbroR
MiscCrop_EJrdnSyr
MiscCrop_ElbeR
MiscCrop_EmsWeserR
MiscCrop_EngWales
MiscCrop_FarahrudR
MiscCrop_FlyR
MiscCrop_FranceCstS
MiscCrop_FranceCstW
MiscCrop_GangesR
MiscCrop_Gironde
MiscCrop_Gobi
MiscCrop_GodavariR
MiscCrop_GreatBasin
MiscCrop_GreatLakes
MiscCrop_GrijUsuR
MiscCrop_GuadalqR
MiscCrop_GuadianaR
MiscCrop_GuineaGulf
MiscCrop_Hainan
MiscCrop_HamuMashR
MiscCrop_Helmand
MiscCrop_Hong
MiscCrop_HuangHeR
MiscCrop_HudsonBay
MiscCrop_IberiaCst
MiscCrop_IdnE
MiscCrop_IndCstE
MiscCrop_IndCstNE
MiscCrop_IndCstS
MiscCrop_IndCstW
MiscCrop_IndusR
MiscCrop_Iran
MiscCrop_Ireland
MiscCrop_IrianJaya
MiscCrop_IrrawaddyR
MiscCrop_ItalyCstE
MiscCrop_ItalyCstW
MiscCrop_Japan
MiscCrop_JavaTimor
MiscCrop_Kalimantan
MiscCrop_Korea
MiscCrop_KrishnaR
MiscCrop_LaPuna
MiscCrop_LBalkash
MiscCrop_LChad
MiscCrop_LenaR
MiscCrop_LimpopoR
MiscCrop_LoireR
MiscCrop_Mackenzie
MiscCrop_Madagascar
MiscCrop_MagdalenaR
MiscCrop_MahanadiR
MiscCrop_MahiR
Deforest_ArgCstS
Deforest_ArkWhtRedR
Deforest_AusCstE
Deforest_AusCstN
Deforest_AusCstS
Deforest_AusCstW
Deforest_BalticSea
Deforest_BarentsSea
Deforest_BengalBay
Deforest_BlackSeaN
Deforest_BlackSeaS
Deforest_BoHai
Deforest_BorneoCstN
Deforest_BrzCstE
Deforest_BrzCstN
Deforest_BrzCstS
Deforest_California
Deforest_CanAtl
Deforest_Caribbean
Deforest_CaspianE
Deforest_CaspianNE
Deforest_CaspianSW
Deforest_ChaoPhrR
Deforest_ChileCstN
Deforest_ChileCstS
Deforest_ChinaCst
Deforest_ChurchillR
Deforest_CntAmer
Deforest_ColEcuaCst
Deforest_CongoR
Deforest_DanubeR
Deforest_DaugavaR
Deforest_DnieperR
Deforest_DniesterR
Deforest_DnkGrmCst
Deforest_DonR
Deforest_DouroR
Deforest_DvinaRN
Deforest_EbroR
Deforest_ElbeR
Deforest_EmsWeserR
Deforest_EngWales
Deforest_Finland
Deforest_FlyR
Deforest_FranceCstS
Deforest_FranceCstW
Deforest_FraserR
Deforest_GangesR
Deforest_Gironde
Deforest_Gobi
Deforest_GreatBasin
Deforest_GreatLakes
Deforest_GrijUsuR
Deforest_GuadalqR
Deforest_GuadianaR
Deforest_GuineaGulf
Deforest_Hong
Deforest_HudsonBay
Deforest_IberiaCst
Deforest_Iceland
Deforest_IdnE
Deforest_Iran
Deforest_Ireland
Deforest_IrianJaya
Deforest_IrrawaddyR
Deforest_ItalyCstE
Deforest_ItalyCstW
Deforest_Japan
Deforest_JavaTimor
Deforest_Kalimantan
Deforest_KaraSea
Deforest_Korea
Deforest_LaPuna
Deforest_LBalkash
Deforest_LChad
Deforest_LenaR
Deforest_LimpopoR
Deforest_LoireR
Deforest_Mackenzie
Deforest_MagdalenaR
Deforest_MalaysiaP
Deforest_MarChiq
Deforest_MeditE
Deforest_MeditIsl
Deforest_Mekong
Deforest_MexBaja
Deforest_MexCstNW
Deforest_MexCstW
Deforest_MexGulf
Deforest_MexInt
Deforest_MissouriR
Deforest_MissppRN
Deforest_MissppRS
Deforest_MurrayDrlg
Deforest_NarvaR
Deforest_NegroR

MiscCrop_MalaysiaP
MiscCrop_MarChiq
MiscCrop_MeditE
MiscCrop_MeditIsl
MiscCrop_MeditS
MiscCrop_Mekong
MiscCrop_MexBaja
MiscCrop_MexCstNW
MiscCrop_MexCstW
MiscCrop_MexGulf
MiscCrop_MexInt
MiscCrop_MissouriR
MiscCrop_MissppRN
MiscCrop_MissppRS
MiscCrop_MurrayDrlg
MiscCrop_NarmadaR
MiscCrop_NarvaR
MiscCrop_NegroR
MiscCrop_NelsonR
MiscCrop_NemanR
MiscCrop_NevaR
MiscCrop_NewCaledn
MiscCrop_NewZealand
MiscCrop_NigerR
MiscCrop_NileR
MiscCrop_NWTerr
MiscCrop_ObR
MiscCrop_OderR
MiscCrop_OhioR
MiscCrop_OrangeR
MiscCrop_OrinocoR
MiscCrop_Pampas
MiscCrop_Papaloapan
MiscCrop_PapuaCst
MiscCrop_ParnaibaR
MiscCrop_PennarR
MiscCrop_PersianGulf
MiscCrop_PeruCst
MiscCrop_Phlppns
MiscCrop_PolandCst
MiscCrop_PoR
MiscCrop_RedSeaE
MiscCrop_RhineR
MiscCrop_RhoneR
MiscCrop_RiftValley
MiscCrop_RioBalsas
MiscCrop_RioGrande
MiscCrop_RioLaPlata
MiscCrop_RioLerma
MiscCrop_RioVerde
MiscCrop_RusCstSE
MiscCrop_SabarmatiR
MiscCrop_Salinas
MiscCrop_Salween
MiscCrop_SAmerCstN
MiscCrop_SAmerCstNE
MiscCrop_SaoFrancR
MiscCrop_ScheldtR
MiscCrop_SChinaSea
MiscCrop_Scotland
MiscCrop_SeineR
MiscCrop_SenegalR
MiscCrop_SepikR
MiscCrop_ShebJubR
MiscCrop_SinaiP
MiscCrop_SittaungR
MiscCrop_SolomonIsl
MiscCrop_SpainCstSE
MiscCrop_SriLanka
MiscCrop_StLwrncR
MiscCrop_Sulawesi
MiscCrop_Sumatra
MiscCrop_SyrDaryaR
MiscCrop_TagusR
MiscCrop_Taiwan
MiscCrop_TaptiR
MiscCrop_Tarim
MiscCrop_Tasmania
MiscCrop_Tehuantpc
MiscCrop_TennR
MiscCrop_ThaiGulf
MiscCrop_TiberR
MiscCrop_TigrEuphR
MiscCrop_TocantinsR
MiscCrop_UralR
MiscCrop_UsaColoRS
MiscCrop_UsaCstE
MiscCrop_UsaCstNE
MiscCrop_UsaCstSE
MiscCrop_UsaPacNW
MiscCrop_VietnamCst
MiscCrop_VolgaR
MiscCrop_VoltaR
MiscCrop_WislaR
MiscCrop_XunJiang
MiscCrop_Yangtze
Deforest_NelsonR
Deforest_NemanR
Deforest_NevaR
Deforest_NewCaledn
Deforest_NewZealand
Deforest_NigerR
Deforest_NileR
Deforest_NWTerr
Deforest_ObR
Deforest_OderR
Deforest_OhioR
Deforest_OrinocoR
Deforest_PacArctic
Deforest_Pampas
Deforest_Papaloapan
Deforest_PapuaCst
Deforest_ParnaibaR
Deforest_Patagonia
Deforest_PeruCst
Deforest_Phlppns
Deforest_PolandCst
Deforest_PoR
Deforest_RhineR
Deforest_RhoneR
Deforest_RiftValley
Deforest_RioBalsas
Deforest_RioGrande
Deforest_RioLaPlata
Deforest_RioLerma
Deforest_RioVerde
Deforest_RusCstSE
Deforest_Salinas
Deforest_Salween
Deforest_SAmerCstN
Deforest_SAmerCstNE
Deforest_SaoFrancR
Deforest_ScheldtR
Deforest_SChinaSea
Deforest_ScndnvN
Deforest_Scotland
Deforest_SeineR
Deforest_SenegalR
Deforest_SepikR
Deforest_SiberiaN
Deforest_SiberiaW
Deforest_SittaungR
Deforest_SolomonIsl
Deforest_SpainCstSE
Deforest_SriLanka
Deforest_StLwrncR
Deforest_Sulawesi
Deforest_Sumatra
Deforest_Sweden
Deforest_SyrDaryaR
Deforest_TagusR
Deforest_Taiwan
Deforest_Tasmania
Deforest_Tehuantpc
Deforest_TennR
Deforest_TexasCst
Deforest_ThaiGulf
Deforest_TiberR
Deforest_TigrEuphR
Deforest_TocantinsR
Deforest_UralR
Deforest_UsaColoRN
Deforest_UsaColoRS
Deforest_UsaCstE
Deforest_UsaCstNE
Deforest_UsaCstSE
Deforest_UsaPacNW
Deforest_VietnamCst
Deforest_VolgaR
Deforest_VoltaR
Deforest_WislaR
Deforest_XunJiang
Deforest_YeniseiR
Deforest_YucatanP
Deforest_ZambeziR
EAF with DRI
EAF with scrap
electricity
electricity_net_ownuse
FeedCrops
FiberCrop_AdrBlkSea_IRR_hi
FiberCrop_AdrBlkSea_IRR_lo
FiberCrop_AdrBlkSea_RFD_hi
FiberCrop_AdrBlkSea_RFD_lo
FiberCrop_AfrCstE_IRR_hi
FiberCrop_AfrCstE_IRR_lo
FiberCrop_AfrCstE_RFD_hi
FiberCrop_AfrCstE_RFD_lo
FiberCrop_AfrCstNE_IRR_hi
FiberCrop_AfrCstNE_IRR_lo
FiberCrop_AfrCstNE_RFD_hi
FiberCrop_AfrCstNE_RFD_lo

MiscCrop_YeniseiR
MiscCrop_YucatanP
MiscCrop_ZambeziR
MiscCrop_ZiyaHe
MiscCropTree_AdrBlkSea
MiscCropTree_AfrCstE
MiscCropTree_AfrCstNE
MiscCropTree_AfrCstNW
MiscCropTree_AfrCstS
MiscCropTree_AfrCstSE
MiscCropTree_AfrCstW
MiscCropTree_AfrIntN
MiscCropTree_AfrIntS
MiscCropTree_AmazonR
MiscCropTree_AmurR
MiscCropTree_AngolaCst
MiscCropTree_ArabianP
MiscCropTree_ArkWhtRedR
MiscCropTree_BengalBay
MiscCropTree_BengalW
MiscCropTree_BlackSeaN
MiscCropTree_BlackSeaS
MiscCropTree_BoHai
MiscCropTree_BorneoCstN
MiscCropTree_BrahmaniR
MiscCropTree_BrzCstE
MiscCropTree_BrzCstN
MiscCropTree_BrzCstS
MiscCropTree_California
MiscCropTree_Caribbean
MiscCropTree_CaspianSW
MiscCropTree_CauveryR
MiscCropTree_ChaoPhrR
MiscCropTree_ChinaCst
MiscCropTree_CntAmer
MiscCropTree_ColEcuaCst
MiscCropTree_CongoR
MiscCropTree_DanubeR
MiscCropTree_DeadSea
MiscCropTree_DnieperR
MiscCropTree_DniesterR
MiscCropTree_DonR
MiscCropTree_DouroR
MiscCropTree_EbroR
MiscCropTree_EJrdnSyr
MiscCropTree_FlyR
MiscCropTree_FranceCstS
MiscCropTree_GangesR
MiscCropTree_Gobi
MiscCropTree_GodavariR
MiscCropTree_GreatBasin
MiscCropTree_GreatLakes
MiscCropTree_GrijUsuR
MiscCropTree_GuadalqR
MiscCropTree_GuadianaR
MiscCropTree_GuineaGulf
MiscCropTree_Hainan
MiscCropTree_Hong
MiscCropTree_HuangHeR
MiscCropTree_IberiaCst
MiscCropTree_IdnE
MiscCropTree_IndCstE
MiscCropTree_IndCstNE
MiscCropTree_IndCstS
MiscCropTree_IndCstW
MiscCropTree_IndusR
MiscCropTree_IrianJaya
MiscCropTree_IrrawaddyR
MiscCropTree_ItalyCstE
MiscCropTree_ItalyCstW
MiscCropTree_JavaTimor
MiscCropTree_Kalimantan
MiscCropTree_KrishnaR
MiscCropTree_LaPuna
MiscCropTree_LBalkash
MiscCropTree_LChad
MiscCropTree_LimpopoR
MiscCropTree_Madagascar
MiscCropTree_MagdalenaR
MiscCropTree_MahanadiR
MiscCropTree_MahiR
MiscCropTree_MalaysiaP
MiscCropTree_MeditE
MiscCropTree_MeditIsl
MiscCropTree_MeditS
MiscCropTree_Mekong
MiscCropTree_MexCstNW
MiscCropTree_MexCstW
MiscCropTree_MexGulf
MiscCropTree_MexInt
MiscCropTree_MissouriR
MiscCropTree_MissppRN
MiscCropTree_MissppRS
MiscCropTree_NarmadaR
MiscCropTree_NelsonR
MiscCropTree_NewCaledn
FiberCrop_AfrCstNW_IRR_hi
FiberCrop_AfrCstNW_IRR_lo
FiberCrop_AfrCstNW_RFD_hi
FiberCrop_AfrCstNW_RFD_lo
FiberCrop_AfrCstS_IRR_hi
FiberCrop_AfrCstS_IRR_lo
FiberCrop_AfrCstS_RFD_hi
FiberCrop_AfrCstS_RFD_lo
FiberCrop_AfrCstSE_IRR_hi
FiberCrop_AfrCstSE_IRR_lo
FiberCrop_AfrCstSE_RFD_hi
FiberCrop_AfrCstSE_RFD_lo
FiberCrop_AfrCstSSW_IRR_hi
FiberCrop_AfrCstSSW_IRR_lo
FiberCrop_AfrCstSSW_RFD_hi
FiberCrop_AfrCstSSW_RFD_lo
FiberCrop_AfrCstW_IRR_hi
FiberCrop_AfrCstW_IRR_lo
FiberCrop_AfrCstW_RFD_hi
FiberCrop_AfrCstW_RFD_lo
FiberCrop_AfrIntN_IRR_hi
FiberCrop_AfrIntN_IRR_lo
FiberCrop_AfrIntN_RFD_hi
FiberCrop_AfrIntN_RFD_lo
FiberCrop_AfrIntS_IRR_hi
FiberCrop_AfrIntS_IRR_lo
FiberCrop_AfrIntS_RFD_hi
FiberCrop_AfrIntS_RFD_lo
FiberCrop_AmazonR_IRR_hi
FiberCrop_AmazonR_IRR_lo
FiberCrop_AmazonR_RFD_hi
FiberCrop_AmazonR_RFD_lo
FiberCrop_AmuDaryaR_IRR_hi
FiberCrop_AmuDaryaR_IRR_lo
FiberCrop_AmuDaryaR_RFD_hi
FiberCrop_AmuDaryaR_RFD_lo
FiberCrop_AmurR_IRR_hi
FiberCrop_AmurR_IRR_lo
FiberCrop_AmurR_RFD_hi
FiberCrop_AmurR_RFD_lo
FiberCrop_AngolaCst_IRR_hi
FiberCrop_AngolaCst_IRR_lo
FiberCrop_AngolaCst_RFD_hi
FiberCrop_AngolaCst_RFD_lo
FiberCrop_ArabianP_IRR_hi
FiberCrop_ArabianP_IRR_lo
FiberCrop_ArabianP_RFD_hi
FiberCrop_ArabianP_RFD_lo
FiberCrop_ArabianSea_IRR_hi
FiberCrop_ArabianSea_IRR_lo
FiberCrop_ArgColoR_IRR_hi
FiberCrop_ArgColoR_IRR_lo
FiberCrop_ArgColoR_RFD_hi
FiberCrop_ArgColoR_RFD_lo
FiberCrop_ArgCstN_IRR_hi
FiberCrop_ArgCstN_IRR_lo
FiberCrop_ArgCstN_RFD_hi
FiberCrop_ArgCstN_RFD_lo
FiberCrop_ArgCstS_IRR_hi
FiberCrop_ArgCstS_IRR_lo
FiberCrop_ArgCstS_RFD_hi
FiberCrop_ArgCstS_RFD_lo
FiberCrop_ArkWhtRedR_IRR_hi
FiberCrop_ArkWhtRedR_IRR_lo
FiberCrop_ArkWhtRedR_RFD_hi
FiberCrop_ArkWhtRedR_RFD_lo
FiberCrop_AusCstE_IRR_hi
FiberCrop_AusCstE_IRR_lo
FiberCrop_BalticSea_IRR_hi
FiberCrop_BalticSea_IRR_lo
FiberCrop_BalticSea_RFD_hi
FiberCrop_BalticSea_RFD_lo
FiberCrop_BarentsSea_IRR_hi
FiberCrop_BarentsSea_IRR_lo
FiberCrop_BarentsSea_RFD_hi
FiberCrop_BarentsSea_RFD_lo
FiberCrop_BengalBay_IRR_hi
FiberCrop_BengalBay_IRR_lo
FiberCrop_BengalBay_RFD_hi
FiberCrop_BengalBay_RFD_lo
FiberCrop_BengalW_IRR_hi
FiberCrop_BengalW_IRR_lo
FiberCrop_BengalW_RFD_hi
FiberCrop_BengalW_RFD_lo
FiberCrop_BlackSeaN_IRR_hi
FiberCrop_BlackSeaN_IRR_lo
FiberCrop_BlackSeaN_RFD_hi
FiberCrop_BlackSeaN_RFD_lo
FiberCrop_BlackSeaS_IRR_hi
FiberCrop_BlackSeaS_IRR_lo
FiberCrop_BoHai_IRR_hi
FiberCrop_BoHai_IRR_lo
FiberCrop_BoHai_RFD_hi
FiberCrop_BoHai_RFD_lo
FiberCrop_BorneoCstN_RFD_hi
FiberCrop_BorneoCstN_RFD_lo

MiscCropTree_NigerR
MiscCropTree_NileR
MiscCropTree_ObR
MiscCropTree_OhioR
MiscCropTree_OrinocoR
MiscCropTree_Papaloapan
MiscCropTree_PapuaCst
MiscCropTree_ParnaibaR
MiscCropTree_PennarR
MiscCropTree_PeruCst
MiscCropTree_Phlppns
MiscCropTree_PoR
MiscCropTree_RedSeaE
MiscCropTree_RhoneR
MiscCropTree_RiftValley
MiscCropTree_RioBalsas
MiscCropTree_RioGrande
MiscCropTree_RioLaPlata
MiscCropTree_RioLerma
MiscCropTree_RioVerde
MiscCropTree_RusCstSE
MiscCropTree_SabarmatiR
MiscCropTree_Salween
MiscCropTree_SAmerCstN
MiscCropTree_SAmerCstNE
MiscCropTree_SaoFrancR
MiscCropTree_SChinaSea
MiscCropTree_SenegalR
MiscCropTree_SepikR
MiscCropTree_ShebJubR
MiscCropTree_SittaungR
MiscCropTree_SolomonIsl
MiscCropTree_SpainCstSE
MiscCropTree_SriLanka
MiscCropTree_Sulawesi
MiscCropTree_Sumatra
MiscCropTree_TagusR
MiscCropTree_TaptiR
MiscCropTree_Tarim
MiscCropTree_Tehuantpc
MiscCropTree_TennR
MiscCropTree_TexasCst
MiscCropTree_ThaiGulf
MiscCropTree_TiberR
MiscCropTree_TigrEuphR
MiscCropTree_TocantinsR
MiscCropTree_UsaColoRN
MiscCropTree_UsaColoRS
MiscCropTree_UsaCstE
MiscCropTree_UsaCstNE
MiscCropTree_UsaCstSE
MiscCropTree_UsaPacNW
MiscCropTree_VietnamCst
MiscCropTree_VoltaR
MiscCropTree_WislaR
MiscCropTree_XunJiang
MiscCropTree_Yangtze
MiscCropTree_YucatanP
MiscCropTree_ZambeziR
MiscCropTree_ZiyaHe
Mixed
mobile
nitric acid
NutsSeeds_AdrBlkSea
NutsSeeds_AfrCstE
NutsSeeds_AfrCstNE
NutsSeeds_AfrCstNW
NutsSeeds_AfrCstS
NutsSeeds_AfrCstSE
NutsSeeds_AfrCstSSW
NutsSeeds_AfrCstSW
NutsSeeds_AfrCstW
NutsSeeds_AfrIntN
NutsSeeds_AfrIntS
NutsSeeds_AmazonR
NutsSeeds_AmuDaryaR
NutsSeeds_AmurR
NutsSeeds_AngolaCst
NutsSeeds_ArabianP
NutsSeeds_ArabianSea
NutsSeeds_ArgColoR
NutsSeeds_ArgCstN
NutsSeeds_ArkWhtRedR
NutsSeeds_AusCstE
NutsSeeds_AusCstN
NutsSeeds_BengalBay
NutsSeeds_BengalW
NutsSeeds_BlackSeaS
NutsSeeds_BoHai
NutsSeeds_BorneoCstN
NutsSeeds_BrahmaniR
NutsSeeds_BrzCstE
NutsSeeds_BrzCstN
NutsSeeds_BrzCstS
NutsSeeds_Caribbean
NutsSeeds_CaspianE
FiberCrop_BrahmaniR_IRR_hi
FiberCrop_BrahmaniR_IRR_lo
FiberCrop_BrahmaniR_RFD_hi
FiberCrop_BrahmaniR_RFD_lo
FiberCrop_BrzCstE_IRR_hi
FiberCrop_BrzCstE_IRR_lo
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FiberCrop_BrzCstS_RFD_lo
FiberCrop_California_IRR_hi
FiberCrop_California_IRR_lo
FiberCrop_California_RFD_hi
FiberCrop_California_RFD_lo
FiberCrop_CanAtl_RFD_hi
FiberCrop_CanAtl_RFD_lo
FiberCrop_Caribbean_IRR_hi
FiberCrop_Caribbean_IRR_lo
FiberCrop_Caribbean_RFD_hi
FiberCrop_Caribbean_RFD_lo
FiberCrop_CaspianE_IRR_hi
FiberCrop_CaspianE_IRR_lo
FiberCrop_CaspianE_RFD_hi
FiberCrop_CaspianE_RFD_lo
FiberCrop_CaspianNE_IRR_hi
FiberCrop_CaspianNE_IRR_lo
FiberCrop_CaspianNE_RFD_hi
FiberCrop_CaspianNE_RFD_lo
FiberCrop_CaspianSW_IRR_hi
FiberCrop_CaspianSW_IRR_lo
FiberCrop_CaspianSW_RFD_hi
FiberCrop_CaspianSW_RFD_lo
FiberCrop_CauveryR_IRR_hi
FiberCrop_CauveryR_IRR_lo
FiberCrop_CauveryR_RFD_hi
FiberCrop_CauveryR_RFD_lo
FiberCrop_ChaoPhrR_IRR_hi
FiberCrop_ChaoPhrR_IRR_lo
FiberCrop_ChaoPhrR_RFD_hi
FiberCrop_ChaoPhrR_RFD_lo
FiberCrop_ChileCstN_IRR_hi
FiberCrop_ChileCstN_IRR_lo
FiberCrop_ChileCstS_IRR_hi
FiberCrop_ChileCstS_IRR_lo
FiberCrop_ChinaCst_IRR_hi
FiberCrop_ChinaCst_IRR_lo
FiberCrop_ChinaCst_RFD_hi
FiberCrop_ChinaCst_RFD_lo
FiberCrop_CntAmer_IRR_hi
FiberCrop_CntAmer_IRR_lo
FiberCrop_CntAmer_RFD_hi
FiberCrop_CntAmer_RFD_lo
FiberCrop_ColEcuaCst_IRR_hi
FiberCrop_ColEcuaCst_IRR_lo
FiberCrop_ColEcuaCst_RFD_hi
FiberCrop_ColEcuaCst_RFD_lo
FiberCrop_CongoR_IRR_hi
FiberCrop_CongoR_IRR_lo
FiberCrop_CongoR_RFD_hi
FiberCrop_CongoR_RFD_lo
FiberCrop_DanubeR_IRR_hi
FiberCrop_DanubeR_IRR_lo
FiberCrop_DanubeR_RFD_hi
FiberCrop_DanubeR_RFD_lo
FiberCrop_DaugavaR_IRR_hi
FiberCrop_DaugavaR_IRR_lo
FiberCrop_DaugavaR_RFD_hi
FiberCrop_DaugavaR_RFD_lo
FiberCrop_DeadSea_IRR_hi
FiberCrop_DeadSea_IRR_lo
FiberCrop_DeadSea_RFD_hi
FiberCrop_DeadSea_RFD_lo
FiberCrop_DnieperR_IRR_hi
FiberCrop_DnieperR_IRR_lo
FiberCrop_DnieperR_RFD_hi
FiberCrop_DnieperR_RFD_lo
FiberCrop_DniesterR_IRR_hi
FiberCrop_DniesterR_IRR_lo
FiberCrop_DniesterR_RFD_hi
FiberCrop_DniesterR_RFD_lo
FiberCrop_DonR_IRR_hi
FiberCrop_DonR_IRR_lo
FiberCrop_DonR_RFD_hi
FiberCrop_DonR_RFD_lo
FiberCrop_DouroR_IRR_hi
FiberCrop_DouroR_IRR_lo
FiberCrop_DouroR_RFD_hi
FiberCrop_DouroR_RFD_lo
FiberCrop_DvinaRN_IRR_hi
FiberCrop_DvinaRN_IRR_lo

NutsSeeds_CaspianNE
NutsSeeds_CaspianSW
NutsSeeds_CauveryR
NutsSeeds_ChaoPhrR
NutsSeeds_ChinaCst
NutsSeeds_CntAmer
NutsSeeds_ColEcuaCst
NutsSeeds_CongoR
NutsSeeds_DanubeR
NutsSeeds_DeadSea
NutsSeeds_DnkGrmCst
NutsSeeds_DouroR
NutsSeeds_EbroR
NutsSeeds_EJrdnSyr
NutsSeeds_ElbeR
NutsSeeds_EmsWeserR
NutsSeeds_FarahrudR
NutsSeeds_FlyR
NutsSeeds_FranceCstS
NutsSeeds_FranceCstW
NutsSeeds_GangesR
NutsSeeds_Gironde
NutsSeeds_Gobi
NutsSeeds_GodavariR
NutsSeeds_GrijUsuR
NutsSeeds_GuadalqR
NutsSeeds_GuadianaR
NutsSeeds_GuineaGulf
NutsSeeds_Hainan
NutsSeeds_Helmand
NutsSeeds_Hong
NutsSeeds_HuangHeR
NutsSeeds_IberiaCst
NutsSeeds_IdnE
NutsSeeds_IndCstE
NutsSeeds_IndCstNE
NutsSeeds_IndCstS
NutsSeeds_IndCstW
NutsSeeds_IndusR
NutsSeeds_Iran
NutsSeeds_IrianJaya
NutsSeeds_IrrawaddyR
NutsSeeds_ItalyCstE
NutsSeeds_Japan
NutsSeeds_JavaTimor
NutsSeeds_Kalimantan
NutsSeeds_Korea
NutsSeeds_KrishnaR
NutsSeeds_LaPuna
NutsSeeds_LBalkash
NutsSeeds_LChad
NutsSeeds_LimpopoR
NutsSeeds_LoireR
NutsSeeds_Madagascar
NutsSeeds_MagdalenaR
NutsSeeds_MahanadiR
NutsSeeds_MahiR
NutsSeeds_MalaysiaP
NutsSeeds_MarChiq
NutsSeeds_MeditE
NutsSeeds_MeditIsl
NutsSeeds_MeditS
NutsSeeds_Mekong
NutsSeeds_MexCstNW
NutsSeeds_MexCstW
NutsSeeds_MexGulf
NutsSeeds_MexInt
NutsSeeds_MissppRS
NutsSeeds_MurrayDrlg
NutsSeeds_NarmadaR
NutsSeeds_NewCaledn
NutsSeeds_NigerR
NutsSeeds_NileR
NutsSeeds_ObR
NutsSeeds_OderR
NutsSeeds_OhioR
NutsSeeds_OrangeR
NutsSeeds_OrinocoR
NutsSeeds_Pampas
NutsSeeds_Papaloapan
NutsSeeds_PapuaCst
NutsSeeds_ParnaibaR
NutsSeeds_PennarR
NutsSeeds_PersianGulf
NutsSeeds_PeruCst
NutsSeeds_Phlppns
NutsSeeds_RedSeaE
NutsSeeds_RhineR
NutsSeeds_RhoneR
NutsSeeds_RiftValley
NutsSeeds_RioBalsas
NutsSeeds_RioGrande
NutsSeeds_RioLaPlata
NutsSeeds_RioLerma
NutsSeeds_RioVerde
NutsSeeds_RusCstSE

FiberCrop_DvinaRN_RFD_hi
FiberCrop_DvinaRN_RFD_lo
FiberCrop_EbroR_IRR_hi
FiberCrop_EbroR_IRR_lo
FiberCrop_EbroR_RFD_hi
FiberCrop_EbroR_RFD_lo
FiberCrop_EJrdnSyr_IRR_hi
FiberCrop_EJrdnSyr_IRR_lo
FiberCrop_ElbeR_IRR_hi
FiberCrop_ElbeR_IRR_lo
FiberCrop_ElbeR_RFD_hi
FiberCrop_ElbeR_RFD_lo
FiberCrop_EmsWeserR_IRR_hi
FiberCrop_EmsWeserR_IRR_lo
FiberCrop_EmsWeserR_RFD_hi
FiberCrop_EmsWeserR_RFD_lo
FiberCrop_EngWales_IRR_hi
FiberCrop_EngWales_IRR_lo
FiberCrop_EngWales_RFD_hi
FiberCrop_EngWales_RFD_lo
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FiberCrop_FarahrudR_IRR_lo
FiberCrop_FarahrudR_RFD_hi
FiberCrop_FarahrudR_RFD_lo
FiberCrop_Finland_RFD_hi
FiberCrop_Finland_RFD_lo
FiberCrop_FlyR_RFD_hi
FiberCrop_FlyR_RFD_lo
FiberCrop_FranceCstS_IRR_hi
FiberCrop_FranceCstS_IRR_lo
FiberCrop_FranceCstS_RFD_hi
FiberCrop_FranceCstS_RFD_lo
FiberCrop_FranceCstW_IRR_hi
FiberCrop_FranceCstW_IRR_lo
FiberCrop_FranceCstW_RFD_hi
FiberCrop_FranceCstW_RFD_lo
FiberCrop_FraserR_IRR_hi
FiberCrop_FraserR_IRR_lo
FiberCrop_FraserR_RFD_hi
FiberCrop_FraserR_RFD_lo
FiberCrop_GangesR_IRR_hi
FiberCrop_GangesR_IRR_lo
FiberCrop_GangesR_RFD_hi
FiberCrop_GangesR_RFD_lo
FiberCrop_Gironde_IRR_hi
FiberCrop_Gironde_IRR_lo
FiberCrop_Gironde_RFD_hi
FiberCrop_Gironde_RFD_lo
FiberCrop_Gobi_IRR_hi
FiberCrop_Gobi_IRR_lo
FiberCrop_Gobi_RFD_hi
FiberCrop_Gobi_RFD_lo
FiberCrop_GodavariR_IRR_hi
FiberCrop_GodavariR_IRR_lo
FiberCrop_GodavariR_RFD_hi
FiberCrop_GodavariR_RFD_lo
FiberCrop_GreatLakes_RFD_hi
FiberCrop_GreatLakes_RFD_lo
FiberCrop_GrijUsuR_IRR_hi
FiberCrop_GrijUsuR_IRR_lo
FiberCrop_GrijUsuR_RFD_hi
FiberCrop_GrijUsuR_RFD_lo
FiberCrop_GuadalqR_IRR_hi
FiberCrop_GuadalqR_IRR_lo
FiberCrop_GuadalqR_RFD_hi
FiberCrop_GuadalqR_RFD_lo
FiberCrop_GuadianaR_IRR_hi
FiberCrop_GuadianaR_IRR_lo
FiberCrop_GuadianaR_RFD_hi
FiberCrop_GuadianaR_RFD_lo
FiberCrop_GuineaGulf_IRR_hi
FiberCrop_GuineaGulf_IRR_lo
FiberCrop_GuineaGulf_RFD_hi
FiberCrop_GuineaGulf_RFD_lo
FiberCrop_Hainan_IRR_hi
FiberCrop_Hainan_IRR_lo
FiberCrop_Hainan_RFD_hi
FiberCrop_Hainan_RFD_lo
FiberCrop_HamuMashR_IRR_hi
FiberCrop_HamuMashR_IRR_lo
FiberCrop_HamuMashR_RFD_hi
FiberCrop_HamuMashR_RFD_lo
FiberCrop_Helmand_IRR_hi
FiberCrop_Helmand_IRR_lo
FiberCrop_Helmand_RFD_hi
FiberCrop_Helmand_RFD_lo
FiberCrop_Hong_IRR_hi
FiberCrop_Hong_IRR_lo
FiberCrop_Hong_RFD_hi
FiberCrop_Hong_RFD_lo
FiberCrop_HuangHeR_IRR_hi
FiberCrop_HuangHeR_IRR_lo
FiberCrop_HuangHeR_RFD_hi
FiberCrop_HuangHeR_RFD_lo
FiberCrop_HudsonBay_RFD_hi
FiberCrop_HudsonBay_RFD_lo

NutsSeeds_SabarmatiR
NutsSeeds_Salinas
NutsSeeds_Salween
NutsSeeds_SAmerCstN
NutsSeeds_SAmerCstNE
NutsSeeds_SaoFrancR
NutsSeeds_ScheldtR
NutsSeeds_SChinaSea
NutsSeeds_SeineR
NutsSeeds_SenegalR
NutsSeeds_SepikR
NutsSeeds_ShebJubR
NutsSeeds_SinaiP
NutsSeeds_SittaungR
NutsSeeds_SpainCstSE
NutsSeeds_SriLanka
NutsSeeds_Sulawesi
NutsSeeds_Sumatra
NutsSeeds_SyrDaryaR
NutsSeeds_TagusR
NutsSeeds_Taiwan
NutsSeeds_TaptiR
NutsSeeds_Tarim
NutsSeeds_Tehuantpc
NutsSeeds_TennR
NutsSeeds_TexasCst
NutsSeeds_ThaiGulf
NutsSeeds_TigrEuphR
NutsSeeds_TocantinsR
NutsSeeds_UralR
NutsSeeds_UsaCstE
NutsSeeds_UsaCstSE
NutsSeeds_VietnamCst
NutsSeeds_VoltaR
NutsSeeds_WislaR
NutsSeeds_XunJiang
NutsSeeds_Yangtze
NutsSeeds_YucatanP
NutsSeeds_ZambeziR
NutsSeeds_ZiyaHe
NutsSeedsTree_AdrBlkSea
NutsSeedsTree_AfrCstE
NutsSeedsTree_AfrCstNE
NutsSeedsTree_AfrCstNW
NutsSeedsTree_AfrCstS
NutsSeedsTree_AfrCstSE
NutsSeedsTree_AfrCstSSW
NutsSeedsTree_AfrCstW
NutsSeedsTree_AfrIntN
NutsSeedsTree_AfrIntS
NutsSeedsTree_AmazonR
NutsSeedsTree_AmuDaryaR
NutsSeedsTree_AmurR
NutsSeedsTree_AngolaCst
NutsSeedsTree_ArabianP
NutsSeedsTree_ArabianSea
NutsSeedsTree_ArgColoR
NutsSeedsTree_ArgCstN
NutsSeedsTree_ArgCstS
NutsSeedsTree_ArkWhtRedR
NutsSeedsTree_AusCstE
NutsSeedsTree_AusCstN
NutsSeedsTree_AusCstS
NutsSeedsTree_AusInt
NutsSeedsTree_BalticSea
NutsSeedsTree_BarentsSea
NutsSeedsTree_BengalBay
NutsSeedsTree_BengalW
NutsSeedsTree_BlackSeaN
NutsSeedsTree_BlackSeaS
NutsSeedsTree_BoHai
NutsSeedsTree_BorneoCstN
NutsSeedsTree_BrahmaniR
NutsSeedsTree_BrzCstE
NutsSeedsTree_BrzCstN
NutsSeedsTree_BrzCstS
NutsSeedsTree_California
NutsSeedsTree_Caribbean
NutsSeedsTree_CaspianE
NutsSeedsTree_CaspianNE
NutsSeedsTree_CaspianSW
NutsSeedsTree_CauveryR
NutsSeedsTree_ChaoPhrR
NutsSeedsTree_ChileCstN
NutsSeedsTree_ChileCstS
NutsSeedsTree_ChinaCst
NutsSeedsTree_CntAmer
NutsSeedsTree_ColEcuaCst
NutsSeedsTree_CongoR
NutsSeedsTree_DanubeR
NutsSeedsTree_DaugavaR
NutsSeedsTree_DeadSea
NutsSeedsTree_DnieperR
NutsSeedsTree_DniesterR
NutsSeedsTree_DnkGrmCst
NutsSeedsTree_DonR
FiberCrop_IberiaCst_IRR_hi
FiberCrop_IberiaCst_IRR_lo
FiberCrop_IberiaCst_RFD_hi
FiberCrop_IberiaCst_RFD_lo
FiberCrop_IdnE_IRR_hi
FiberCrop_IdnE_IRR_lo
FiberCrop_IdnE_RFD_hi
FiberCrop_IdnE_RFD_lo
FiberCrop_IndCstE_IRR_hi
FiberCrop_IndCstE_IRR_lo
FiberCrop_IndCstE_RFD_hi
FiberCrop_IndCstE_RFD_lo
FiberCrop_IndCstNE_IRR_hi
FiberCrop_IndCstNE_IRR_lo
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FiberCrop_IndCstNE_RFD_lo
FiberCrop_IndCstS_IRR_hi
FiberCrop_IndCstS_IRR_lo
FiberCrop_IndCstS_RFD_hi
FiberCrop_IndCstS_RFD_lo
FiberCrop_IndCstW_IRR_hi
FiberCrop_IndCstW_IRR_lo
FiberCrop_IndCstW_RFD_hi
FiberCrop_IndCstW_RFD_lo
FiberCrop_IndusR_IRR_hi
FiberCrop_IndusR_IRR_lo
FiberCrop_IndusR_RFD_hi
FiberCrop_IndusR_RFD_lo
FiberCrop_Iran_IRR_hi
FiberCrop_Iran_IRR_lo
FiberCrop_Ireland_IRR_hi
FiberCrop_Ireland_IRR_lo
FiberCrop_Ireland_RFD_hi
FiberCrop_Ireland_RFD_lo
FiberCrop_IrianJaya_RFD_hi
FiberCrop_IrianJaya_RFD_lo
FiberCrop_IrrawaddyR_IRR_hi
FiberCrop_IrrawaddyR_IRR_lo
FiberCrop_IrrawaddyR_RFD_hi
FiberCrop_IrrawaddyR_RFD_lo
FiberCrop_ItalyCstE_IRR_hi
FiberCrop_ItalyCstE_IRR_lo
FiberCrop_ItalyCstE_RFD_hi
FiberCrop_ItalyCstE_RFD_lo
FiberCrop_ItalyCstW_IRR_hi
FiberCrop_ItalyCstW_IRR_lo
FiberCrop_ItalyCstW_RFD_hi
FiberCrop_ItalyCstW_RFD_lo
FiberCrop_Japan_RFD_hi
FiberCrop_Japan_RFD_lo
FiberCrop_JavaTimor_IRR_hi
FiberCrop_JavaTimor_IRR_lo
FiberCrop_JavaTimor_RFD_hi
FiberCrop_JavaTimor_RFD_lo
FiberCrop_Kalimantan_IRR_hi
FiberCrop_Kalimantan_IRR_lo
FiberCrop_Kalimantan_RFD_hi
FiberCrop_Kalimantan_RFD_lo
FiberCrop_Korea_IRR_hi
FiberCrop_Korea_IRR_lo
FiberCrop_Korea_RFD_hi
FiberCrop_Korea_RFD_lo
FiberCrop_KrishnaR_IRR_hi
FiberCrop_KrishnaR_IRR_lo
FiberCrop_KrishnaR_RFD_hi
FiberCrop_KrishnaR_RFD_lo
FiberCrop_LaPuna_IRR_hi
FiberCrop_LaPuna_IRR_lo
FiberCrop_LaPuna_RFD_hi
FiberCrop_LaPuna_RFD_lo
FiberCrop_LBalkash_IRR_hi
FiberCrop_LBalkash_IRR_lo
FiberCrop_LBalkash_RFD_hi
FiberCrop_LBalkash_RFD_lo
FiberCrop_LChad_IRR_hi
FiberCrop_LChad_IRR_lo
FiberCrop_LChad_RFD_hi
FiberCrop_LChad_RFD_lo
FiberCrop_LenaR_IRR_hi
FiberCrop_LenaR_IRR_lo
FiberCrop_LenaR_RFD_hi
FiberCrop_LenaR_RFD_lo
FiberCrop_LimpopoR_IRR_hi
FiberCrop_LimpopoR_IRR_lo
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FiberCrop_LimpopoR_RFD_lo
FiberCrop_LoireR_IRR_hi
FiberCrop_LoireR_IRR_lo
FiberCrop_LoireR_RFD_hi
FiberCrop_LoireR_RFD_lo
FiberCrop_Mackenzie_RFD_hi
FiberCrop_Mackenzie_RFD_lo
FiberCrop_Madagascar_IRR_hi
FiberCrop_Madagascar_IRR_lo
FiberCrop_Madagascar_RFD_hi
FiberCrop_Madagascar_RFD_lo

NutsSeedsTree_DouroR
NutsSeedsTree_DvinaRN
NutsSeedsTree_EbroR
NutsSeedsTree_EJrdnSyr
NutsSeedsTree_ElbeR
NutsSeedsTree_EmsWeserR
NutsSeedsTree_FarahrudR
NutsSeedsTree_Finland
NutsSeedsTree_FlyR
NutsSeedsTree_FranceCstS
NutsSeedsTree_FranceCstW
NutsSeedsTree_FraserR
NutsSeedsTree_GangesR
NutsSeedsTree_Gironde
NutsSeedsTree_Gobi
NutsSeedsTree_GodavariR
NutsSeedsTree_GreatBasin
NutsSeedsTree_GreatLakes
NutsSeedsTree_GrijUsuR
NutsSeedsTree_GuadalqR
NutsSeedsTree_GuadianaR
NutsSeedsTree_GuineaGulf
NutsSeedsTree_Hainan
NutsSeedsTree_HamuMashR
NutsSeedsTree_Helmand
NutsSeedsTree_Hong
NutsSeedsTree_HuangHeR
NutsSeedsTree_IberiaCst
NutsSeedsTree_IdnE
NutsSeedsTree_IndCstE
NutsSeedsTree_IndCstNE
NutsSeedsTree_IndCstS
NutsSeedsTree_IndCstW
NutsSeedsTree_IndusR
NutsSeedsTree_Iran
NutsSeedsTree_IrianJaya
NutsSeedsTree_IrrawaddyR
NutsSeedsTree_ItalyCstE
NutsSeedsTree_ItalyCstW
NutsSeedsTree_Japan
NutsSeedsTree_JavaTimor
NutsSeedsTree_Kalimantan
NutsSeedsTree_Korea
NutsSeedsTree_KrishnaR
NutsSeedsTree_LaPuna
NutsSeedsTree_LBalkash
NutsSeedsTree_LChad
NutsSeedsTree_LenaR
NutsSeedsTree_LimpopoR
NutsSeedsTree_LoireR
NutsSeedsTree_Madagascar
NutsSeedsTree_MagdalenaR
NutsSeedsTree_MahanadiR
NutsSeedsTree_MahiR
NutsSeedsTree_MalaysiaP
NutsSeedsTree_MarChiq
NutsSeedsTree_MeditE
NutsSeedsTree_MeditIsl
NutsSeedsTree_MeditS
NutsSeedsTree_Mekong
NutsSeedsTree_MexBaja
NutsSeedsTree_MexCstNW
NutsSeedsTree_MexCstW
NutsSeedsTree_MexGulf
NutsSeedsTree_MexInt
NutsSeedsTree_MissouriR
NutsSeedsTree_MissppRN
NutsSeedsTree_MissppRS
NutsSeedsTree_MurrayDrlg
NutsSeedsTree_NarmadaR
NutsSeedsTree_NarvaR
NutsSeedsTree_NegroR
NutsSeedsTree_NelsonR
NutsSeedsTree_NemanR
NutsSeedsTree_NevaR
NutsSeedsTree_NewCaledn
NutsSeedsTree_NigerR
NutsSeedsTree_NileR
NutsSeedsTree_ObR
NutsSeedsTree_OderR
NutsSeedsTree_OhioR
NutsSeedsTree_OrangeR
NutsSeedsTree_OrinocoR
NutsSeedsTree_Pampas
NutsSeedsTree_Papaloapan
NutsSeedsTree_PapuaCst
NutsSeedsTree_ParnaibaR
NutsSeedsTree_PennarR
NutsSeedsTree_PersianGulf
NutsSeedsTree_PeruCst
NutsSeedsTree_Phlppns
NutsSeedsTree_PolandCst
NutsSeedsTree_PoR
NutsSeedsTree_RedSeaE
NutsSeedsTree_RhineR
NutsSeedsTree_RhoneR

FiberCrop_MagdalenaR_IRR_hi
FiberCrop_MagdalenaR_IRR_lo
FiberCrop_MagdalenaR_RFD_hi
FiberCrop_MagdalenaR_RFD_lo
FiberCrop_MahanadiR_IRR_hi
FiberCrop_MahanadiR_IRR_lo
FiberCrop_MahanadiR_RFD_hi
FiberCrop_MahanadiR_RFD_lo
FiberCrop_MahiR_IRR_hi
FiberCrop_MahiR_IRR_lo
FiberCrop_MahiR_RFD_hi
FiberCrop_MahiR_RFD_lo
FiberCrop_MalaysiaP_IRR_hi
FiberCrop_MalaysiaP_IRR_lo
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FiberCrop_MexInt_IRR_hi
FiberCrop_MexInt_IRR_lo
FiberCrop_MexInt_RFD_hi
FiberCrop_MexInt_RFD_lo
FiberCrop_MissouriR_IRR_hi
FiberCrop_MissouriR_IRR_lo
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FiberCrop_MissppRN_IRR_hi
FiberCrop_MissppRN_IRR_lo
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FiberCrop_MissppRN_RFD_lo
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FiberCrop_MissppRS_IRR_lo
FiberCrop_MissppRS_RFD_hi
FiberCrop_MissppRS_RFD_lo
FiberCrop_MurrayDrlg_IRR_hi
FiberCrop_MurrayDrlg_IRR_lo
FiberCrop_MurrayDrlg_RFD_hi
FiberCrop_MurrayDrlg_RFD_lo
FiberCrop_NarmadaR_IRR_hi
FiberCrop_NarmadaR_IRR_lo
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FiberCrop_NegroR_IRR_hi
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FiberCrop_NemanR_IRR_lo
FiberCrop_NemanR_RFD_hi
FiberCrop_NemanR_RFD_lo
FiberCrop_NevaR_IRR_hi
FiberCrop_NevaR_IRR_lo
FiberCrop_NevaR_RFD_hi
FiberCrop_NevaR_RFD_lo

NutsSeedsTree_RiftValley
NutsSeedsTree_RioBalsas
NutsSeedsTree_RioGrande
NutsSeedsTree_RioLaPlata
NutsSeedsTree_RioLerma
NutsSeedsTree_RioVerde
NutsSeedsTree_RusCstSE
NutsSeedsTree_SabarmatiR
NutsSeedsTree_Salinas
NutsSeedsTree_Salween
NutsSeedsTree_SAmerCstN
NutsSeedsTree_SaoFrancR
NutsSeedsTree_ScheldtR
NutsSeedsTree_SChinaSea
NutsSeedsTree_SeineR
NutsSeedsTree_SenegalR
NutsSeedsTree_SepikR
NutsSeedsTree_ShebJubR
NutsSeedsTree_SiberiaW
NutsSeedsTree_SinaiP
NutsSeedsTree_SittaungR
NutsSeedsTree_SolomonIsl
NutsSeedsTree_SpainCstSE
NutsSeedsTree_SriLanka
NutsSeedsTree_Sulawesi
NutsSeedsTree_Sumatra
NutsSeedsTree_SyrDaryaR
NutsSeedsTree_TagusR
NutsSeedsTree_Taiwan
NutsSeedsTree_TaptiR
NutsSeedsTree_Tarim
NutsSeedsTree_Tehuantpc
NutsSeedsTree_TennR
NutsSeedsTree_TexasCst
NutsSeedsTree_ThaiGulf
NutsSeedsTree_TiberR
NutsSeedsTree_TigrEuphR
NutsSeedsTree_TocantinsR
NutsSeedsTree_UralR
NutsSeedsTree_UsaColoRN
NutsSeedsTree_UsaColoRS
NutsSeedsTree_UsaCstE
NutsSeedsTree_UsaCstNE
NutsSeedsTree_UsaCstSE
NutsSeedsTree_UsaPacNW
NutsSeedsTree_VietnamCst
NutsSeedsTree_VolgaR
NutsSeedsTree_VoltaR
NutsSeedsTree_WislaR
NutsSeedsTree_XunJiang
NutsSeedsTree_Yangtze
NutsSeedsTree_YeniseiR
NutsSeedsTree_YucatanP
NutsSeedsTree_ZambeziR
NutsSeedsTree_ZiyaHe
OilCrop_AdrBlkSea
OilCrop_AfrCstE
OilCrop_AfrCstNE
OilCrop_AfrCstNW
OilCrop_AfrCstS
OilCrop_AfrCstSE
OilCrop_AfrCstSSW
OilCrop_AfrCstSW
OilCrop_AfrCstW
OilCrop_AfrIntN
OilCrop_AfrIntS
OilCrop_AmazonR
OilCrop_AmuDaryaR
OilCrop_AmurR
OilCrop_AngolaCst
OilCrop_ArabianP
OilCrop_ArabianSea
OilCrop_ArgColoR
OilCrop_ArgCstN
OilCrop_ArgCstS
OilCrop_ArkWhtRedR
OilCrop_AusCstE
OilCrop_AusCstN
OilCrop_AusCstS
OilCrop_AusCstW
OilCrop_AusInt
OilCrop_BalticSea
OilCrop_BarentsSea
OilCrop_BengalBay
OilCrop_BengalW
OilCrop_BlackSeaN
OilCrop_BlackSeaS
OilCrop_BoHai
OilCrop_BorneoCstN
OilCrop_BrahmaniR
OilCrop_BrzCstE
OilCrop_BrzCstN
OilCrop_BrzCstS
OilCrop_California
OilCrop_CanAtl
OilCrop_Caribbean

FiberCrop_NewZealand_IRR_hi
FiberCrop_NewZealand_IRR_lo
FiberCrop_NewZealand_RFD_hi
FiberCrop_NewZealand_RFD_lo
FiberCrop_NigerR_IRR_hi
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FiberCrop_Papaloapan_RFD_hi
FiberCrop_Papaloapan_RFD_lo
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FiberCrop_ParnaibaR_IRR_lo
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FiberCrop_ParnaibaR_RFD_lo
FiberCrop_PennarR_IRR_hi
FiberCrop_PennarR_IRR_lo
FiberCrop_PennarR_RFD_hi
FiberCrop_PennarR_RFD_lo
FiberCrop_PersianGulf_IRR_hi
FiberCrop_PersianGulf_IRR_lo
FiberCrop_PeruCst_IRR_hi
FiberCrop_PeruCst_IRR_lo
FiberCrop_PeruCst_RFD_hi
FiberCrop_PeruCst_RFD_lo
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FiberCrop_RedSeaE_IRR_hi
FiberCrop_RedSeaE_IRR_lo
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FiberCrop_RhoneR_IRR_hi
FiberCrop_RhoneR_IRR_lo
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FiberCrop_RioGrande_IRR_hi
FiberCrop_RioGrande_IRR_lo
FiberCrop_RioGrande_RFD_hi
FiberCrop_RioGrande_RFD_lo

OilCrop_CaspianE
OilCrop_CaspianNE
OilCrop_CaspianSW
OilCrop_CauveryR
OilCrop_ChaoPhrR
OilCrop_ChileCstN
OilCrop_ChileCstS
OilCrop_ChinaCst
OilCrop_CntAmer
OilCrop_ColEcuaCst
OilCrop_CongoR
OilCrop_DanubeR
OilCrop_DaugavaR
OilCrop_DeadSea
OilCrop_DnieperR
OilCrop_DniesterR
OilCrop_DnkGrmCst
OilCrop_DonR
OilCrop_DouroR
OilCrop_DvinaRN
OilCrop_EbroR
OilCrop_EJrdnSyr
OilCrop_ElbeR
OilCrop_EmsWeserR
OilCrop_EngWales
OilCrop_FarahrudR
OilCrop_Finland
OilCrop_FranceCstS
OilCrop_FranceCstW
OilCrop_FraserR
OilCrop_GangesR
OilCrop_Gironde
OilCrop_Gobi
OilCrop_GodavariR
OilCrop_GreatBasin
OilCrop_GreatLakes
OilCrop_GrijUsuR
OilCrop_GuadalqR
OilCrop_GuadianaR
OilCrop_GuineaGulf
OilCrop_Hainan
OilCrop_HamuMashR
OilCrop_Helmand
OilCrop_Hong
OilCrop_HuangHeR
OilCrop_HudsonBay
OilCrop_IberiaCst
OilCrop_IdnE
OilCrop_IndCstE
OilCrop_IndCstNE
OilCrop_IndCstS
OilCrop_IndCstW
OilCrop_IndusR
OilCrop_Iran
OilCrop_Ireland
OilCrop_IrianJaya
OilCrop_IrrawaddyR
OilCrop_ItalyCstE
OilCrop_ItalyCstW
OilCrop_Japan
OilCrop_JavaTimor
OilCrop_Kalimantan
OilCrop_Korea
OilCrop_KrishnaR
OilCrop_LaPuna
OilCrop_LBalkash
OilCrop_LChad
OilCrop_LenaR
OilCrop_LimpopoR
OilCrop_LoireR
OilCrop_Mackenzie
OilCrop_Madagascar
OilCrop_MagdalenaR
OilCrop_MahanadiR
OilCrop_MahiR
OilCrop_MalaysiaP
OilCrop_MarChiq
OilCrop_MeditE
OilCrop_MeditIsl
OilCrop_MeditS
OilCrop_Mekong
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OilCrop_MexCstNW
OilCrop_MexCstW
OilCrop_MexGulf
OilCrop_MexInt
OilCrop_MissouriR
OilCrop_MissppRN
OilCrop_MissppRS
OilCrop_MurrayDrlg
OilCrop_NarmadaR
OilCrop_NarvaR
OilCrop_NegroR
OilCrop_NelsonR
OilCrop_NemanR
OilCrop_NevaR

FiberCrop_RioLaPlata_IRR_hi
FiberCrop_RioLaPlata_IRR_lo
FiberCrop_RioLaPlata_RFD_hi
FiberCrop_RioLaPlata_RFD_lo
FiberCrop_RioLerma_IRR_hi
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FiberCrop_RioVerde_IRR_lo
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FiberCrop_SabarmatiR_IRR_lo
FiberCrop_SabarmatiR_RFD_hi
FiberCrop_SabarmatiR_RFD_lo
FiberCrop_Salinas_IRR_hi
FiberCrop_Salinas_IRR_lo
FiberCrop_Salinas_RFD_hi
FiberCrop_Salinas_RFD_lo
FiberCrop_Salween_IRR_hi
FiberCrop_Salween_IRR_lo
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FiberCrop_ScheldtR_IRR_lo
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FiberCrop_ScheldtR_RFD_lo
FiberCrop_SChinaSea_IRR_hi
FiberCrop_SChinaSea_IRR_lo
FiberCrop_SChinaSea_RFD_hi
FiberCrop_SChinaSea_RFD_lo
FiberCrop_Scotland_IRR_hi
FiberCrop_Scotland_IRR_lo
FiberCrop_Scotland_RFD_hi
FiberCrop_Scotland_RFD_lo
FiberCrop_SeineR_IRR_hi
FiberCrop_SeineR_IRR_lo
FiberCrop_SeineR_RFD_hi
FiberCrop_SeineR_RFD_lo
FiberCrop_SenegalR_IRR_hi
FiberCrop_SenegalR_IRR_lo
FiberCrop_SenegalR_RFD_hi
FiberCrop_SenegalR_RFD_lo
FiberCrop_SepikR_RFD_hi
FiberCrop_SepikR_RFD_lo
FiberCrop_ShebJubR_IRR_hi
FiberCrop_ShebJubR_IRR_lo
FiberCrop_ShebJubR_RFD_hi
FiberCrop_ShebJubR_RFD_lo
FiberCrop_SiberiaW_IRR_hi
FiberCrop_SiberiaW_IRR_lo
FiberCrop_SiberiaW_RFD_hi
FiberCrop_SiberiaW_RFD_lo
FiberCrop_SinaiP_IRR_hi
FiberCrop_SinaiP_IRR_lo
FiberCrop_SittaungR_IRR_hi
FiberCrop_SittaungR_IRR_lo
FiberCrop_SittaungR_RFD_hi
FiberCrop_SittaungR_RFD_lo
FiberCrop_SpainCstSE_IRR_hi
FiberCrop_SpainCstSE_IRR_lo
FiberCrop_SpainCstSE_RFD_hi
FiberCrop_SpainCstSE_RFD_lo
FiberCrop_StLwrncR_RFD_hi
FiberCrop_StLwrncR_RFD_lo
FiberCrop_Sulawesi_IRR_hi
FiberCrop_Sulawesi_IRR_lo
FiberCrop_Sulawesi_RFD_hi
FiberCrop_Sulawesi_RFD_lo
FiberCrop_Sumatra_IRR_hi
FiberCrop_Sumatra_IRR_lo
FiberCrop_Sumatra_RFD_hi
FiberCrop_Sumatra_RFD_lo
FiberCrop_SyrDaryaR_IRR_hi
FiberCrop_SyrDaryaR_IRR_lo
FiberCrop_SyrDaryaR_RFD_hi
FiberCrop_SyrDaryaR_RFD_lo
FiberCrop_TagusR_IRR_hi
FiberCrop_TagusR_IRR_lo

OilCrop_NewZealand
OilCrop_NigerR
OilCrop_NileR
OilCrop_NWTerr
OilCrop_ObR
OilCrop_OderR
OilCrop_OhioR
OilCrop_OrangeR
OilCrop_OrinocoR
OilCrop_PacArctic
OilCrop_Pampas
OilCrop_Papaloapan
OilCrop_ParnaibaR
OilCrop_Patagonia
OilCrop_PennarR
OilCrop_PersianGulf
OilCrop_PeruCst
OilCrop_Phlppns
OilCrop_PolandCst
OilCrop_PoR
OilCrop_RedSeaE
OilCrop_RhineR
OilCrop_RhoneR
OilCrop_RiftValley
OilCrop_RioBalsas
OilCrop_RioGrande
OilCrop_RioLaPlata
OilCrop_RioLerma
OilCrop_RioVerde
OilCrop_RusCstSE
OilCrop_SabarmatiR
OilCrop_Salinas
OilCrop_Salween
OilCrop_SAmerCstN
OilCrop_SAmerCstNE
OilCrop_SaoFrancR
OilCrop_ScheldtR
OilCrop_SChinaSea
OilCrop_ScndnvN
OilCrop_Scotland
OilCrop_SeineR
OilCrop_SenegalR
OilCrop_SepikR
OilCrop_ShebJubR
OilCrop_SiberiaW
OilCrop_SinaiP
OilCrop_SittaungR
OilCrop_SpainCstSE
OilCrop_SriLanka
OilCrop_StLwrncR
OilCrop_Sulawesi
OilCrop_Sumatra
OilCrop_Sweden
OilCrop_SyrDaryaR
OilCrop_TagusR
OilCrop_Taiwan
OilCrop_TaptiR
OilCrop_Tarim
OilCrop_Tasmania
OilCrop_Tehuantpc
OilCrop_TennR
OilCrop_TexasCst
OilCrop_ThaiGulf
OilCrop_TiberR
OilCrop_TigrEuphR
OilCrop_TocantinsR
OilCrop_UralR
OilCrop_UsaColoRN
OilCrop_UsaColoRS
OilCrop_UsaCstE
OilCrop_UsaCstNE
OilCrop_UsaCstSE
OilCrop_UsaPacNW
OilCrop_VietnamCst
OilCrop_VolgaR
OilCrop_VoltaR
OilCrop_WislaR
OilCrop_XunJiang
OilCrop_Yangtze
OilCrop_YeniseiR
OilCrop_YucatanP
OilCrop_ZambeziR
OilCrop_ZiyaHe
OilCropTree_AdrBlkSea
OilCropTree_AfrCstE
OilCropTree_AfrCstNE
OilCropTree_AfrCstNW
OilCropTree_AfrCstS
OilCropTree_AfrCstSE
OilCropTree_AfrCstW
OilCropTree_AfrIntN
OilCropTree_AmazonR
OilCropTree_AmuDaryaR
OilCropTree_AmurR
OilCropTree_ArabianP
OilCropTree_ArabianSea
FiberCrop_TagusR_RFD_hi
FiberCrop_TagusR_RFD_lo
FiberCrop_Taiwan_IRR_hi
FiberCrop_Taiwan_IRR_lo
FiberCrop_Taiwan_RFD_hi
FiberCrop_Taiwan_RFD_lo
FiberCrop_TaptiR_IRR_hi
FiberCrop_TaptiR_IRR_lo
FiberCrop_TaptiR_RFD_hi
FiberCrop_TaptiR_RFD_lo
FiberCrop_Tarim_IRR_hi
FiberCrop_Tarim_IRR_lo
FiberCrop_Tarim_RFD_hi
FiberCrop_Tarim_RFD_lo
FiberCrop_Tehuantpc_IRR_hi
FiberCrop_Tehuantpc_IRR_lo
FiberCrop_Tehuantpc_RFD_hi
FiberCrop_Tehuantpc_RFD_lo
FiberCrop_TennR_IRR_hi
FiberCrop_TennR_IRR_lo
FiberCrop_TennR_RFD_hi
FiberCrop_TennR_RFD_lo
FiberCrop_TexasCst_IRR_hi
FiberCrop_TexasCst_IRR_lo
FiberCrop_TexasCst_RFD_hi
FiberCrop_TexasCst_RFD_lo
FiberCrop_ThaiGulf_IRR_hi
FiberCrop_ThaiGulf_IRR_lo
FiberCrop_ThaiGulf_RFD_hi
FiberCrop_ThaiGulf_RFD_lo
FiberCrop_TiberR_IRR_hi
FiberCrop_TiberR_IRR_lo
FiberCrop_TiberR_RFD_hi
FiberCrop_TiberR_RFD_lo
FiberCrop_TigrEuphR_IRR_hi
FiberCrop_TigrEuphR_IRR_lo
FiberCrop_TocantinsR_IRR_hi
FiberCrop_TocantinsR_IRR_lo
FiberCrop_TocantinsR_RFD_hi
FiberCrop_TocantinsR_RFD_lo
FiberCrop_UralR_IRR_hi
FiberCrop_UralR_IRR_lo
FiberCrop_UralR_RFD_hi
FiberCrop_UralR_RFD_lo
FiberCrop_UsaColoRS_IRR_hi
FiberCrop_UsaColoRS_IRR_lo
FiberCrop_UsaColoRS_RFD_hi
FiberCrop_UsaColoRS_RFD_lo
FiberCrop_UsaCstE_IRR_hi
FiberCrop_UsaCstE_IRR_lo
FiberCrop_UsaCstE_RFD_hi
FiberCrop_UsaCstE_RFD_lo
FiberCrop_UsaCstNE_RFD_hi
FiberCrop_UsaCstNE_RFD_lo
FiberCrop_UsaCstSE_IRR_hi
FiberCrop_UsaCstSE_IRR_lo
FiberCrop_UsaCstSE_RFD_hi
FiberCrop_UsaCstSE_RFD_lo
FiberCrop_UsaPacNW_IRR_hi
FiberCrop_UsaPacNW_IRR_lo
FiberCrop_UsaPacNW_RFD_hi
FiberCrop_UsaPacNW_RFD_lo
FiberCrop_VietnamCst_IRR_hi
FiberCrop_VietnamCst_IRR_lo
FiberCrop_VietnamCst_RFD_hi
FiberCrop_VietnamCst_RFD_lo
FiberCrop_VolgaR_IRR_hi
FiberCrop_VolgaR_IRR_lo
FiberCrop_VolgaR_RFD_hi
FiberCrop_VolgaR_RFD_lo
FiberCrop_VoltaR_RFD_hi
FiberCrop_VoltaR_RFD_lo
FiberCrop_WislaR_IRR_hi
FiberCrop_WislaR_IRR_lo
FiberCrop_WislaR_RFD_hi
FiberCrop_WislaR_RFD_lo
FiberCrop_XunJiang_IRR_hi
FiberCrop_XunJiang_IRR_lo
FiberCrop_XunJiang_RFD_hi
FiberCrop_XunJiang_RFD_lo
FiberCrop_Yangtze_IRR_hi
FiberCrop_Yangtze_IRR_lo
FiberCrop_Yangtze_RFD_hi
FiberCrop_Yangtze_RFD_lo
FiberCrop_YeniseiR_IRR_hi
FiberCrop_YeniseiR_IRR_lo
FiberCrop_YeniseiR_RFD_hi
FiberCrop_YeniseiR_RFD_lo
FiberCrop_YucatanP_IRR_hi
FiberCrop_YucatanP_IRR_lo
FiberCrop_YucatanP_RFD_hi
FiberCrop_YucatanP_RFD_lo
FiberCrop_ZambeziR_IRR_hi
FiberCrop_ZambeziR_IRR_lo
FiberCrop_ZambeziR_RFD_hi
FiberCrop_ZambeziR_RFD_lo

OilCropTree_ArgColoR
OilCropTree_ArgCstN
OilCropTree_ArgCstS
OilCropTree_AusCstE
OilCropTree_AusCstS
OilCropTree_AusCstW
OilCropTree_AusInt
OilCropTree_BengalBay
OilCropTree_BengalW
OilCropTree_BlackSeaS
OilCropTree_BoHai
OilCropTree_BorneoCstN
OilCropTree_BrahmaniR
OilCropTree_BrzCstE
OilCropTree_BrzCstN
OilCropTree_BrzCstS
OilCropTree_California
OilCropTree_Caribbean
OilCropTree_CaspianE
OilCropTree_CaspianNE
OilCropTree_CaspianSW
OilCropTree_CauveryR
OilCropTree_ChaoPhrR
OilCropTree_ChileCstN
OilCropTree_ChileCstS
OilCropTree_ChinaCst
OilCropTree_CntAmer
OilCropTree_ColEcuaCst
OilCropTree_CongoR
OilCropTree_DanubeR
OilCropTree_DeadSea
OilCropTree_DouroR
OilCropTree_EbroR
OilCropTree_EJrdnSyr
OilCropTree_FarahrudR
OilCropTree_FlyR
OilCropTree_FranceCstS
OilCropTree_FranceCstW
OilCropTree_GangesR
OilCropTree_Gironde
OilCropTree_Gobi
OilCropTree_GodavariR
OilCropTree_GrijUsuR
OilCropTree_GuadalqR
OilCropTree_GuadianaR
OilCropTree_GuineaGulf
OilCropTree_Hainan
OilCropTree_HamuMashR
OilCropTree_Helmand
OilCropTree_Hong
OilCropTree_HuangHeR
OilCropTree_IberiaCst
OilCropTree_IdnE
OilCropTree_IndCstE
OilCropTree_IndCstNE
OilCropTree_IndCstS
OilCropTree_IndCstW
OilCropTree_IndusR
OilCropTree_Iran
OilCropTree_IrianJaya
OilCropTree_IrrawaddyR
OilCropTree_ItalyCstE
OilCropTree_ItalyCstW
OilCropTree_JavaTimor
OilCropTree_Kalimantan
OilCropTree_KrishnaR
OilCropTree_LaPuna
OilCropTree_LBalkash
OilCropTree_LChad
OilCropTree_LimpopoR
OilCropTree_LoireR
OilCropTree_Madagascar
OilCropTree_MagdalenaR
OilCropTree_MahanadiR
OilCropTree_MahiR
OilCropTree_MalaysiaP
OilCropTree_MarChiq
OilCropTree_MeditE
OilCropTree_MeditIsl
OilCropTree_MeditS
OilCropTree_Mekong
OilCropTree_MexBaja
OilCropTree_MexCstNW
OilCropTree_MexCstW
OilCropTree_MexGulf
OilCropTree_MexInt
OilCropTree_MurrayDrlg
OilCropTree_NarmadaR
OilCropTree_NegroR
OilCropTree_NewCaledn
OilCropTree_NigerR
OilCropTree_NileR
OilCropTree_ObR
OilCropTree_OrinocoR
OilCropTree_Pampas
OilCropTree_Papaloapan
FiberCrop_ZiyaHe_IRR_hi
FiberCrop_ZiyaHe_IRR_lo
FiberCrop_ZiyaHe_RFD_hi
FiberCrop_ZiyaHe_RFD_lo
fire_exting
foams
FodderGrass_AdrBlkSea_IRR_hi
FodderGrass_AdrBlkSea_IRR_lo
FodderGrass_AdrBlkSea_RFD_hi
FodderGrass_AdrBlkSea_RFD_lo
FodderGrass_AfrCstNE_IRR_hi
FodderGrass_AfrCstNE_IRR_lo
FodderGrass_AfrCstNE_RFD_hi
FodderGrass_AfrCstNE_RFD_lo
FodderGrass_AfrCstNW_RFD_hi
FodderGrass_AfrCstNW_RFD_lo
FodderGrass_AfrIntN_RFD_hi
FodderGrass_AfrIntN_RFD_lo
FodderGrass_AmazonR_RFD_hi
FodderGrass_AmazonR_RFD_lo
FodderGrass_AmuDaryaR_IRR_hi
FodderGrass_AmuDaryaR_IRR_lo
FodderGrass_AmuDaryaR_RFD_hi
FodderGrass_AmuDaryaR_RFD_lo
FodderGrass_AmurR_IRR_hi
FodderGrass_AmurR_IRR_lo
FodderGrass_AmurR_RFD_hi
FodderGrass_AmurR_RFD_lo
FodderGrass_ArabianP_IRR_hi
FodderGrass_ArabianP_IRR_lo
FodderGrass_ArabianP_RFD_hi
FodderGrass_ArabianP_RFD_lo
FodderGrass_ArabianSea_RFD_hi
FodderGrass_ArabianSea_RFD_lo
FodderGrass_ArgColoR_IRR_hi
FodderGrass_ArgColoR_IRR_lo
FodderGrass_ArgColoR_RFD_hi
FodderGrass_ArgColoR_RFD_lo
FodderGrass_ArgCstN_IRR_hi
FodderGrass_ArgCstN_IRR_lo
FodderGrass_ArgCstN_RFD_hi
FodderGrass_ArgCstN_RFD_lo
FodderGrass_ArgCstS_IRR_hi
FodderGrass_ArgCstS_IRR_lo
FodderGrass_ArgCstS_RFD_hi
FodderGrass_ArgCstS_RFD_lo
FodderGrass_ArkWhtRedR_IRR_hi
FodderGrass_ArkWhtRedR_IRR_lo
FodderGrass_ArkWhtRedR_RFD_hi
FodderGrass_ArkWhtRedR_RFD_lo
FodderGrass_AusCstE_IRR_hi
FodderGrass_AusCstE_IRR_lo
FodderGrass_AusCstE_RFD_hi
FodderGrass_AusCstE_RFD_lo
FodderGrass_AusCstN_IRR_hi
FodderGrass_AusCstN_IRR_lo
FodderGrass_AusCstN_RFD_hi
FodderGrass_AusCstN_RFD_lo
FodderGrass_AusCstS_IRR_hi
FodderGrass_AusCstS_IRR_lo
FodderGrass_AusCstS_RFD_hi
FodderGrass_AusCstS_RFD_lo
FodderGrass_AusCstW_IRR_hi
FodderGrass_AusCstW_IRR_lo
FodderGrass_AusCstW_RFD_hi
FodderGrass_AusCstW_RFD_lo
FodderGrass_AusInt_IRR_hi
FodderGrass_AusInt_IRR_lo
FodderGrass_AusInt_RFD_hi
FodderGrass_AusInt_RFD_lo
FodderGrass_BalticSea_IRR_hi
FodderGrass_BalticSea_IRR_lo
FodderGrass_BalticSea_RFD_hi
FodderGrass_BalticSea_RFD_lo
FodderGrass_BarentsSea_RFD_hi
FodderGrass_BarentsSea_RFD_lo
FodderGrass_BengalBay_RFD_hi
FodderGrass_BengalBay_RFD_lo
FodderGrass_BengalW_RFD_hi
FodderGrass_BengalW_RFD_lo
FodderGrass_BlackSeaN_IRR_hi
FodderGrass_BlackSeaN_IRR_lo
FodderGrass_BlackSeaN_RFD_hi
FodderGrass_BlackSeaN_RFD_lo
FodderGrass_BlackSeaS_IRR_hi
FodderGrass_BlackSeaS_IRR_lo
FodderGrass_BoHai_RFD_hi
FodderGrass_BoHai_RFD_lo
FodderGrass_BrahmaniR_RFD_hi
FodderGrass_BrahmaniR_RFD_lo
FodderGrass_California_IRR_hi
FodderGrass_California_IRR_lo
FodderGrass_California_RFD_hi
FodderGrass_California_RFD_lo
FodderGrass_CaspianE_RFD_hi
FodderGrass_CaspianE_RFD_lo

OilCropTree_PapuaCst
OilCropTree_ParnaibaR
OilCropTree_Patagonia
OilCropTree_PennarR
OilCropTree_PersianGulf
OilCropTree_PeruCst
OilCropTree_Phlppns
OilCropTree_PoR
OilCropTree_RedSeaE
OilCropTree_RhoneR
OilCropTree_RiftValley
OilCropTree_RioBalsas
OilCropTree_RioLaPlata
OilCropTree_RioLerma
OilCropTree_RioVerde
OilCropTree_RusCstSE
OilCropTree_SabarmatiR
OilCropTree_Salinas
OilCropTree_Salween
OilCropTree_SAmerCstN
OilCropTree_SAmerCstNE
OilCropTree_SaoFrancR
OilCropTree_SChinaSea
OilCropTree_SenegalR
OilCropTree_SepikR
OilCropTree_ShebJubR
OilCropTree_SinaiP
OilCropTree_SittaungR
OilCropTree_SolomonIsl
OilCropTree_SpainCstSE
OilCropTree_SriLanka
OilCropTree_Sulawesi
OilCropTree_Sumatra
OilCropTree_SyrDaryaR
OilCropTree_TagusR
OilCropTree_Taiwan
OilCropTree_TaptiR
OilCropTree_Tarim
OilCropTree_Tasmania
OilCropTree_Tehuantpc
OilCropTree_ThaiGulf
OilCropTree_TiberR
OilCropTree_TigrEuphR
OilCropTree_TocantinsR
OilCropTree_UsaColoRS
OilCropTree_VietnamCst
OilCropTree_VoltaR
OilCropTree_XunJiang
OilCropTree_Yangtze
OilCropTree_YucatanP
OilCropTree_ZambeziR
OilCropTree_ZiyaHe
OilPalmTree_AfrCstE
OilPalmTree_AfrCstW
OilPalmTree_AfrIntS
OilPalmTree_AmazonR
OilPalmTree_AmurR
OilPalmTree_AngolaCst
OilPalmTree_BoHai
OilPalmTree_BorneoCstN
OilPalmTree_BrzCstN
OilPalmTree_BrzCstS
OilPalmTree_Caribbean
OilPalmTree_ChaoPhrR
OilPalmTree_ChinaCst
OilPalmTree_CntAmer
OilPalmTree_ColEcuaCst
OilPalmTree_CongoR
OilPalmTree_FlyR
OilPalmTree_GangesR
OilPalmTree_Gobi
OilPalmTree_GrijUsuR
OilPalmTree_GuineaGulf
OilPalmTree_Hainan
OilPalmTree_Hong
OilPalmTree_HuangHeR
OilPalmTree_IrianJaya
OilPalmTree_IrrawaddyR
OilPalmTree_JavaTimor
OilPalmTree_Kalimantan
OilPalmTree_LaPuna
OilPalmTree_LBalkash
OilPalmTree_LChad
OilPalmTree_Madagascar
OilPalmTree_MagdalenaR
OilPalmTree_MalaysiaP
OilPalmTree_Mekong
OilPalmTree_NewCaledn
OilPalmTree_NigerR
OilPalmTree_NileR
OilPalmTree_ObR
OilPalmTree_OrinocoR
OilPalmTree_Papaloapan
OilPalmTree_PapuaCst
OilPalmTree_PeruCst
OilPalmTree_Phlppns
FodderGrass_CaspianNE_IRR_hi
FodderGrass_CaspianNE_IRR_lo
FodderGrass_CaspianNE_RFD_hi
FodderGrass_CaspianNE_RFD_lo
FodderGrass_CaspianSW_IRR_hi
FodderGrass_CaspianSW_IRR_lo
FodderGrass_CaspianSW_RFD_hi
FodderGrass_CaspianSW_RFD_lo
FodderGrass_CauveryR_RFD_hi
FodderGrass_CauveryR_RFD_lo
FodderGrass_ChaoPhrR_RFD_hi
FodderGrass_ChaoPhrR_RFD_lo
FodderGrass_ChileCstN_RFD_hi
FodderGrass_ChileCstN_RFD_lo
FodderGrass_ChileCstS_IRR_hi
FodderGrass_ChileCstS_IRR_lo
FodderGrass_ChileCstS_RFD_hi
FodderGrass_ChileCstS_RFD_lo
FodderGrass_ChinaCst_RFD_hi
FodderGrass_ChinaCst_RFD_lo
FodderGrass_CntAmer_IRR_hi
FodderGrass_CntAmer_IRR_lo
FodderGrass_CntAmer_RFD_hi
FodderGrass_CntAmer_RFD_lo
FodderGrass_ColEcuaCst_RFD_hi
FodderGrass_ColEcuaCst_RFD_lo
FodderGrass_CongoR_RFD_hi
FodderGrass_CongoR_RFD_lo
FodderGrass_DanubeR_IRR_hi
FodderGrass_DanubeR_IRR_lo
FodderGrass_DanubeR_RFD_hi
FodderGrass_DanubeR_RFD_lo
FodderGrass_DaugavaR_IRR_hi
FodderGrass_DaugavaR_IRR_lo
FodderGrass_DaugavaR_RFD_hi
FodderGrass_DaugavaR_RFD_lo
FodderGrass_DeadSea_RFD_hi
FodderGrass_DeadSea_RFD_lo
FodderGrass_DnieperR_IRR_hi
FodderGrass_DnieperR_IRR_lo
FodderGrass_DnieperR_RFD_hi
FodderGrass_DnieperR_RFD_lo
FodderGrass_DniesterR_IRR_hi
FodderGrass_DniesterR_IRR_lo
FodderGrass_DniesterR_RFD_hi
FodderGrass_DniesterR_RFD_lo
FodderGrass_DnkGrmCst_IRR_hi
FodderGrass_DnkGrmCst_IRR_lo
FodderGrass_DnkGrmCst_RFD_hi
FodderGrass_DnkGrmCst_RFD_lo
FodderGrass_DonR_IRR_hi
FodderGrass_DonR_IRR_lo
FodderGrass_DonR_RFD_hi
FodderGrass_DonR_RFD_lo
FodderGrass_DouroR_IRR_hi
FodderGrass_DouroR_IRR_lo
FodderGrass_DouroR_RFD_hi
FodderGrass_DouroR_RFD_lo
FodderGrass_DvinaRN_IRR_hi
FodderGrass_DvinaRN_IRR_lo
FodderGrass_DvinaRN_RFD_hi
FodderGrass_DvinaRN_RFD_lo
FodderGrass_EbroR_IRR_hi
FodderGrass_EbroR_IRR_lo
FodderGrass_EbroR_RFD_hi
FodderGrass_EbroR_RFD_lo
FodderGrass_EJrdnSyr_IRR_hi
FodderGrass_EJrdnSyr_IRR_lo
FodderGrass_EJrdnSyr_RFD_hi
FodderGrass_EJrdnSyr_RFD_lo
FodderGrass_ElbeR_IRR_hi
FodderGrass_ElbeR_IRR_lo
FodderGrass_ElbeR_RFD_hi
FodderGrass_ElbeR_RFD_lo
FodderGrass_EmsWeserR_IRR_hi
FodderGrass_EmsWeserR_IRR_lo
FodderGrass_EmsWeserR_RFD_hi
FodderGrass_EmsWeserR_RFD_lo
FodderGrass_FarahrudR_RFD_hi
FodderGrass_FarahrudR_RFD_lo
FodderGrass_Finland_IRR_hi
FodderGrass_Finland_IRR_lo
FodderGrass_Finland_RFD_hi
FodderGrass_Finland_RFD_lo
FodderGrass_FranceCstS_IRR_hi
FodderGrass_FranceCstS_IRR_lo
FodderGrass_FranceCstS_RFD_hi
FodderGrass_FranceCstS_RFD_lo
FodderGrass_FranceCstW_IRR_hi
FodderGrass_FranceCstW_IRR_lo
FodderGrass_FranceCstW_RFD_hi
FodderGrass_FranceCstW_RFD_lo
FodderGrass_FraserR_IRR_hi
FodderGrass_FraserR_IRR_lo
FodderGrass_FraserR_RFD_hi
FodderGrass_FraserR_RFD_lo

OilPalmTree_RiftValley
OilPalmTree_RioLaPlata
OilPalmTree_RusCstSE
OilPalmTree_Salween
OilPalmTree_SAmerCstN
OilPalmTree_SAmerCstNE
OilPalmTree_SChinaSea
OilPalmTree_SenegalR
OilPalmTree_SepikR
OilPalmTree_SolomonIsl
OilPalmTree_Sulawesi
OilPalmTree_Sumatra
OilPalmTree_Tarim
OilPalmTree_Tehuantpc
OilPalmTree_ThaiGulf
OilPalmTree_TocantinsR
OilPalmTree_VietnamCst
OilPalmTree_VoltaR
OilPalmTree_XunJiang
OilPalmTree_Yangtze
OilPalmTree_YucatanP
OilPalmTree_ZambeziR
OilPalmTree_ZiyaHe
other industrial processes
OtherGrain_AdrBlkSea
OtherGrain_AfrCstE
OtherGrain_AfrCstNE
OtherGrain_AfrCstNW
OtherGrain_AfrCstS
OtherGrain_AfrCstSE
OtherGrain_AfrCstSSW
OtherGrain_AfrCstW
OtherGrain_AfrIntN
OtherGrain_AfrIntS
OtherGrain_AmazonR
OtherGrain_AmuDaryaR
OtherGrain_AmurR
OtherGrain_ArabianP
OtherGrain_ArabianSea
OtherGrain_ArgColoR
OtherGrain_ArgCstN
OtherGrain_ArgCstS
OtherGrain_ArkWhtRedR
OtherGrain_AusCstE
OtherGrain_AusCstN
OtherGrain_AusCstS
OtherGrain_AusCstW
OtherGrain_AusInt
OtherGrain_BalticSea
OtherGrain_BarentsSea
OtherGrain_BengalBay
OtherGrain_BengalW
OtherGrain_BlackSeaN
OtherGrain_BlackSeaS
OtherGrain_BoHai
OtherGrain_BrahmaniR
OtherGrain_BrzCstE
OtherGrain_BrzCstN
OtherGrain_BrzCstS
OtherGrain_California
OtherGrain_CanAtl
OtherGrain_CaspianE
OtherGrain_CaspianNE
OtherGrain_CaspianSW
OtherGrain_ChaoPhrR
OtherGrain_ChileCstN
OtherGrain_ChileCstS
OtherGrain_ChinaCst
OtherGrain_CntAmer
OtherGrain_ColEcuaCst
OtherGrain_CongoR
OtherGrain_DanubeR
OtherGrain_DaugavaR
OtherGrain_DeadSea
OtherGrain_DnieperR
OtherGrain_DniesterR
OtherGrain_DnkGrmCst
OtherGrain_DonR
OtherGrain_DouroR
OtherGrain_DvinaRN
OtherGrain_EbroR
OtherGrain_EJrdnSyr
OtherGrain_ElbeR
OtherGrain_EmsWeserR
OtherGrain_EngWales
OtherGrain_FarahrudR
OtherGrain_Finland
OtherGrain_FranceCstS
OtherGrain_FranceCstW
OtherGrain_FraserR
OtherGrain_GangesR
OtherGrain_Gironde
OtherGrain_Gobi
OtherGrain_GodavariR
OtherGrain_GreatBasin
OtherGrain_GreatLakes
FodderGrass_GangesR_RFD_hi
FodderGrass_GangesR_RFD_lo
FodderGrass_Gironde_IRR_hi
FodderGrass_Gironde_IRR_lo
FodderGrass_Gironde_RFD_hi
FodderGrass_Gironde_RFD_lo
FodderGrass_Gobi_IRR_hi
FodderGrass_Gobi_IRR_lo
FodderGrass_Gobi_RFD_hi
FodderGrass_Gobi_RFD_lo
FodderGrass_GodavariR_RFD_hi
FodderGrass_GodavariR_RFD_lo
FodderGrass_GreatBasin_IRR_hi
FodderGrass_GreatBasin_IRR_lo
FodderGrass_GreatBasin_RFD_hi
FodderGrass_GreatBasin_RFD_lo
FodderGrass_GreatLakes_IRR_hi
FodderGrass_GreatLakes_IRR_lo
FodderGrass_GreatLakes_RFD_hi
FodderGrass_GreatLakes_RFD_lo
FodderGrass_GrijUsuR_IRR_hi
FodderGrass_GrijUsuR_IRR_lo
FodderGrass_GrijUsuR_RFD_hi
FodderGrass_GrijUsuR_RFD_lo
FodderGrass_GuadalqR_IRR_hi
FodderGrass_GuadalqR_IRR_lo
FodderGrass_GuadalqR_RFD_hi
FodderGrass_GuadalqR_RFD_lo
FodderGrass_GuadianaR_IRR_hi
FodderGrass_GuadianaR_IRR_lo
FodderGrass_GuadianaR_RFD_hi
FodderGrass_GuadianaR_RFD_lo
FodderGrass_Hainan_RFD_hi
FodderGrass_Hainan_RFD_lo
FodderGrass_HamuMashR_RFD_hi
FodderGrass_HamuMashR_RFD_lo
FodderGrass_Helmand_RFD_hi
FodderGrass_Helmand_RFD_lo
FodderGrass_Hong_RFD_hi
FodderGrass_Hong_RFD_lo
FodderGrass_HuangHeR_RFD_hi
FodderGrass_HuangHeR_RFD_lo
FodderGrass_IberiaCst_IRR_hi
FodderGrass_IberiaCst_IRR_lo
FodderGrass_IberiaCst_RFD_hi
FodderGrass_IberiaCst_RFD_lo
FodderGrass_IndCstE_RFD_hi
FodderGrass_IndCstE_RFD_lo
FodderGrass_IndCstNE_RFD_hi
FodderGrass_IndCstNE_RFD_lo
FodderGrass_IndCstS_RFD_hi
FodderGrass_IndCstS_RFD_lo
FodderGrass_IndCstW_RFD_hi
FodderGrass_IndCstW_RFD_lo
FodderGrass_IndusR_RFD_hi
FodderGrass_IndusR_RFD_lo
FodderGrass_Iran_RFD_hi
FodderGrass_Iran_RFD_lo
FodderGrass_IrrawaddyR_RFD_hi
FodderGrass_IrrawaddyR_RFD_lo
FodderGrass_ItalyCstE_IRR_hi
FodderGrass_ItalyCstE_IRR_lo
FodderGrass_ItalyCstE_RFD_hi
FodderGrass_ItalyCstE_RFD_lo
FodderGrass_ItalyCstW_IRR_hi
FodderGrass_ItalyCstW_IRR_lo
FodderGrass_ItalyCstW_RFD_hi
FodderGrass_ItalyCstW_RFD_lo
FodderGrass_Japan_IRR_hi
FodderGrass_Japan_IRR_lo
FodderGrass_Japan_RFD_hi
FodderGrass_Japan_RFD_lo
FodderGrass_Korea_RFD_hi
FodderGrass_Korea_RFD_lo
FodderGrass_KrishnaR_RFD_hi
FodderGrass_KrishnaR_RFD_lo
FodderGrass_LaPuna_RFD_hi
FodderGrass_LaPuna_RFD_lo
FodderGrass_LBalkash_IRR_hi
FodderGrass_LBalkash_IRR_lo
FodderGrass_LBalkash_RFD_hi
FodderGrass_LBalkash_RFD_lo
FodderGrass_LChad_IRR_hi
FodderGrass_LChad_IRR_lo
FodderGrass_LenaR_RFD_hi
FodderGrass_LenaR_RFD_lo
FodderGrass_LoireR_IRR_hi
FodderGrass_LoireR_IRR_lo
FodderGrass_LoireR_RFD_hi
FodderGrass_LoireR_RFD_lo
FodderGrass_MahanadiR_RFD_hi
FodderGrass_MahanadiR_RFD_lo
FodderGrass_MahiR_RFD_hi
FodderGrass_MahiR_RFD_lo
FodderGrass_MalaysiaP_RFD_hi
FodderGrass_MalaysiaP_RFD_lo

OtherGrain_GrijUsuR
OtherGrain_GuadalqR
OtherGrain_GuadianaR
OtherGrain_GuineaGulf
OtherGrain_Hainan
OtherGrain_HamuMashR
OtherGrain_Helmand
OtherGrain_Hong
OtherGrain_HuangHeR
OtherGrain_HudsonBay
OtherGrain_IberiaCst
OtherGrain_IndusR
OtherGrain_Iran
OtherGrain_Ireland
OtherGrain_IrrawaddyR
OtherGrain_ItalyCstE
OtherGrain_ItalyCstW
OtherGrain_Japan
OtherGrain_Korea
OtherGrain_LaPuna
OtherGrain_LBalkash
OtherGrain_LChad
OtherGrain_LenaR
OtherGrain_LimpopoR
OtherGrain_LoireR
OtherGrain_Mackenzie
OtherGrain_MagdalenaR
OtherGrain_MahanadiR
OtherGrain_MahiR
OtherGrain_MalaysiaP
OtherGrain_MarChiq
OtherGrain_MeditE
OtherGrain_MeditIsl
OtherGrain_MeditS
OtherGrain_Mekong
OtherGrain_MexBaja
OtherGrain_MexCstNW
OtherGrain_MexCstW
OtherGrain_MexGulf
OtherGrain_MexInt
OtherGrain_MissouriR
OtherGrain_MissppRN
OtherGrain_MissppRS
OtherGrain_MurrayDrlg
OtherGrain_NarmadaR
OtherGrain_NarvaR
OtherGrain_NegroR
OtherGrain_NelsonR
OtherGrain_NemanR
OtherGrain_NevaR
OtherGrain_NewZealand
OtherGrain_NigerR
OtherGrain_NileR
OtherGrain_NWTerr
OtherGrain_ObR
OtherGrain_OderR
OtherGrain_OhioR
OtherGrain_OrangeR
OtherGrain_OrinocoR
OtherGrain_PacArctic
OtherGrain_Pampas
OtherGrain_Papaloapan
OtherGrain_ParnaibaR
OtherGrain_Patagonia
OtherGrain_PersianGulf
OtherGrain_PeruCst
OtherGrain_PolandCst
OtherGrain_PoR
OtherGrain_RedSeaE
OtherGrain_RhineR
OtherGrain_RhoneR
OtherGrain_RiftValley
OtherGrain_RioBalsas
OtherGrain_RioGrande
OtherGrain_RioLaPlata
OtherGrain_RioLerma
OtherGrain_RioVerde
OtherGrain_RusCstSE
OtherGrain_SabarmatiR
OtherGrain_Salinas
OtherGrain_Salween
OtherGrain_SAmerCstN
OtherGrain_SAmerCstNE
OtherGrain_SaoFrancR
OtherGrain_ScheldtR
OtherGrain_SChinaSea
OtherGrain_ScndnvN
OtherGrain_Scotland
OtherGrain_SeineR
OtherGrain_SenegalR
OtherGrain_ShebJubR
OtherGrain_SiberiaW
OtherGrain_SinaiP
OtherGrain_SittaungR
OtherGrain_SpainCstSE
OtherGrain_StLwrncR

FodderGrass_MarChiq_IRR_hi
FodderGrass_MarChiq_IRR_lo
FodderGrass_MarChiq_RFD_hi
FodderGrass_MarChiq_RFD_lo
FodderGrass_MeditE_IRR_hi
FodderGrass_MeditE_IRR_lo
FodderGrass_MeditE_RFD_hi
FodderGrass_MeditE_RFD_lo
FodderGrass_MeditIsl_IRR_hi
FodderGrass_MeditIsl_IRR_lo
FodderGrass_MeditIsl_RFD_hi
FodderGrass_MeditIsl_RFD_lo
FodderGrass_MeditS_RFD_hi
FodderGrass_MeditS_RFD_lo
FodderGrass_Mekong_RFD_hi
FodderGrass_Mekong_RFD_lo
FodderGrass_MexBaja_IRR_hi
FodderGrass_MexBaja_IRR_lo
FodderGrass_MexBaja_RFD_hi
FodderGrass_MexBaja_RFD_lo
FodderGrass_MexCstNW_IRR_hi
FodderGrass_MexCstNW_IRR_lo
FodderGrass_MexCstNW_RFD_hi
FodderGrass_MexCstNW_RFD_lo
FodderGrass_MexCstW_IRR_hi
FodderGrass_MexCstW_IRR_lo
FodderGrass_MexCstW_RFD_hi
FodderGrass_MexCstW_RFD_lo
FodderGrass_MexGulf_IRR_hi
FodderGrass_MexGulf_IRR_lo
FodderGrass_MexGulf_RFD_hi
FodderGrass_MexGulf_RFD_lo
FodderGrass_MexInt_IRR_hi
FodderGrass_MexInt_IRR_lo
FodderGrass_MexInt_RFD_hi
FodderGrass_MexInt_RFD_lo
FodderGrass_MissouriR_IRR_hi
FodderGrass_MissouriR_IRR_lo
FodderGrass_MissouriR_RFD_hi
FodderGrass_MissouriR_RFD_lo
FodderGrass_MissppRN_IRR_hi
FodderGrass_MissppRN_IRR_lo
FodderGrass_MissppRN_RFD_hi
FodderGrass_MissppRN_RFD_lo
FodderGrass_MissppRS_IRR_hi
FodderGrass_MissppRS_IRR_lo
FodderGrass_MissppRS_RFD_hi
FodderGrass_MissppRS_RFD_lo
FodderGrass_MurrayDrlg_IRR_hi
FodderGrass_MurrayDrlg_IRR_lo
FodderGrass_MurrayDrlg_RFD_hi
FodderGrass_MurrayDrlg_RFD_lo
FodderGrass_NarmadaR_RFD_hi
FodderGrass_NarmadaR_RFD_lo
FodderGrass_NarvaR_IRR_hi
FodderGrass_NarvaR_IRR_lo
FodderGrass_NarvaR_RFD_hi
FodderGrass_NarvaR_RFD_lo
FodderGrass_NegroR_IRR_hi
FodderGrass_NegroR_IRR_lo
FodderGrass_NegroR_RFD_hi
FodderGrass_NegroR_RFD_lo
FodderGrass_NelsonR_IRR_hi
FodderGrass_NelsonR_IRR_lo
FodderGrass_NelsonR_RFD_hi
FodderGrass_NelsonR_RFD_lo
FodderGrass_NemanR_IRR_hi
FodderGrass_NemanR_IRR_lo
FodderGrass_NemanR_RFD_hi
FodderGrass_NemanR_RFD_lo
FodderGrass_NevaR_IRR_hi
FodderGrass_NevaR_IRR_lo
FodderGrass_NevaR_RFD_hi
FodderGrass_NevaR_RFD_lo
FodderGrass_NewZealand_IRR_hi
FodderGrass_NewZealand_IRR_lo
FodderGrass_NileR_IRR_hi
FodderGrass_NileR_IRR_lo
FodderGrass_NileR_RFD_hi
FodderGrass_NileR_RFD_lo
FodderGrass_ObR_IRR_hi
FodderGrass_ObR_IRR_lo
FodderGrass_ObR_RFD_hi
FodderGrass_ObR_RFD_lo
FodderGrass_OderR_IRR_hi
FodderGrass_OderR_IRR_lo
FodderGrass_OderR_RFD_hi
FodderGrass_OderR_RFD_lo
FodderGrass_OhioR_IRR_hi
FodderGrass_OhioR_IRR_lo
FodderGrass_OhioR_RFD_hi
FodderGrass_OhioR_RFD_lo
FodderGrass_Pampas_IRR_hi
FodderGrass_Pampas_IRR_lo
FodderGrass_Pampas_RFD_hi
FodderGrass_Pampas_RFD_lo

OtherGrain_Sweden
OtherGrain_SyrDaryaR
OtherGrain_TagusR
OtherGrain_Taiwan
OtherGrain_TaptiR
OtherGrain_Tarim
OtherGrain_Tasmania
OtherGrain_Tehuantpc
OtherGrain_TennR
OtherGrain_TexasCst
OtherGrain_ThaiGulf
OtherGrain_TiberR
OtherGrain_TigrEuphR
OtherGrain_TocantinsR
OtherGrain_UralR
OtherGrain_UsaColoRN
OtherGrain_UsaColoRS
OtherGrain_UsaCstE
OtherGrain_UsaCstNE
OtherGrain_UsaCstSE
OtherGrain_UsaPacNW
OtherGrain_VolgaR
OtherGrain_VoltaR
OtherGrain_WislaR
OtherGrain_XunJiang
OtherGrain_Yangtze
OtherGrain_YeniseiR
OtherGrain_YucatanP
OtherGrain_ZambeziR
OtherGrain_ZiyaHe
OtherGrainC4_AdrBlkSea
OtherGrainC4_AfrCstE
OtherGrainC4_AfrCstNE
OtherGrainC4_AfrCstNW
OtherGrainC4_AfrCstS
OtherGrainC4_AfrCstSE
OtherGrainC4_AfrCstSSW
OtherGrainC4_AfrCstSW
OtherGrainC4_AfrCstW
OtherGrainC4_AfrIntN
OtherGrainC4_AfrIntS
OtherGrainC4_AmazonR
OtherGrainC4_AmuDaryaR
OtherGrainC4_AmurR
OtherGrainC4_AngolaCst
OtherGrainC4_ArabianP
OtherGrainC4_ArabianSea
OtherGrainC4_ArgColoR
OtherGrainC4_ArgCstN
OtherGrainC4_ArgCstS
OtherGrainC4_ArkWhtRedR
OtherGrainC4_AusCstE
OtherGrainC4_AusCstN
OtherGrainC4_AusCstS
OtherGrainC4_AusCstW
OtherGrainC4_AusInt
OtherGrainC4_BalticSea
OtherGrainC4_BarentsSea
OtherGrainC4_BengalBay
OtherGrainC4_BengalW
OtherGrainC4_BlackSeaN
OtherGrainC4_BlackSeaS
OtherGrainC4_BoHai
OtherGrainC4_BrahmaniR
OtherGrainC4_BrzCstE
OtherGrainC4_BrzCstS
OtherGrainC4_California
OtherGrainC4_Caribbean
OtherGrainC4_CaspianE
OtherGrainC4_CaspianNE
OtherGrainC4_CaspianSW
OtherGrainC4_CauveryR
OtherGrainC4_ChaoPhrR
OtherGrainC4_ChileCstS
OtherGrainC4_ChinaCst
OtherGrainC4_CntAmer
OtherGrainC4_ColEcuaCst
OtherGrainC4_CongoR
OtherGrainC4_DanubeR
OtherGrainC4_DaugavaR
OtherGrainC4_DeadSea
OtherGrainC4_DnieperR
OtherGrainC4_DniesterR
OtherGrainC4_DnkGrmCst
OtherGrainC4_DonR
OtherGrainC4_DouroR
OtherGrainC4_DvinaRN
OtherGrainC4_EbroR
OtherGrainC4_EJrdnSyr
OtherGrainC4_ElbeR
OtherGrainC4_FarahrudR
OtherGrainC4_Finland
OtherGrainC4_FlyR
OtherGrainC4_FranceCstS
OtherGrainC4_FranceCstW
OtherGrainC4_GangesR
FodderGrass_Papaloapan_IRR_hi
FodderGrass_Papaloapan_IRR_lo
FodderGrass_Papaloapan_RFD_hi
FodderGrass_Papaloapan_RFD_lo
FodderGrass_Patagonia_IRR_hi
FodderGrass_Patagonia_IRR_lo
FodderGrass_Patagonia_RFD_hi
FodderGrass_Patagonia_RFD_lo
FodderGrass_PennarR_RFD_hi
FodderGrass_PennarR_RFD_lo
FodderGrass_PersianGulf_RFD_hi
FodderGrass_PersianGulf_RFD_lo
FodderGrass_PeruCst_RFD_hi
FodderGrass_PeruCst_RFD_lo
FodderGrass_Phlppns_RFD_hi
FodderGrass_Phlppns_RFD_lo
FodderGrass_PolandCst_IRR_hi
FodderGrass_PolandCst_IRR_lo
FodderGrass_PolandCst_RFD_hi
FodderGrass_PolandCst_RFD_lo
FodderGrass_PoR_IRR_hi
FodderGrass_PoR_IRR_lo
FodderGrass_PoR_RFD_hi
FodderGrass_PoR_RFD_lo
FodderGrass_RedSeaE_IRR_hi
FodderGrass_RedSeaE_IRR_lo
FodderGrass_RedSeaE_RFD_hi
FodderGrass_RedSeaE_RFD_lo
FodderGrass_RhineR_IRR_hi
FodderGrass_RhineR_IRR_lo
FodderGrass_RhineR_RFD_hi
FodderGrass_RhineR_RFD_lo
FodderGrass_RhoneR_IRR_hi
FodderGrass_RhoneR_IRR_lo
FodderGrass_RhoneR_RFD_hi
FodderGrass_RhoneR_RFD_lo
FodderGrass_RiftValley_RFD_hi
FodderGrass_RiftValley_RFD_lo
FodderGrass_RioBalsas_IRR_hi
FodderGrass_RioBalsas_IRR_lo
FodderGrass_RioBalsas_RFD_hi
FodderGrass_RioBalsas_RFD_lo
FodderGrass_RioGrande_IRR_hi
FodderGrass_RioGrande_IRR_lo
FodderGrass_RioGrande_RFD_hi
FodderGrass_RioGrande_RFD_lo
FodderGrass_RioLaPlata_IRR_hi
FodderGrass_RioLaPlata_IRR_lo
FodderGrass_RioLaPlata_RFD_hi
FodderGrass_RioLaPlata_RFD_lo
FodderGrass_RioLerma_IRR_hi
FodderGrass_RioLerma_IRR_lo
FodderGrass_RioLerma_RFD_hi
FodderGrass_RioLerma_RFD_lo
FodderGrass_RioVerde_IRR_hi
FodderGrass_RioVerde_IRR_lo
FodderGrass_RioVerde_RFD_hi
FodderGrass_RioVerde_RFD_lo
FodderGrass_RusCstSE_IRR_hi
FodderGrass_RusCstSE_IRR_lo
FodderGrass_RusCstSE_RFD_hi
FodderGrass_RusCstSE_RFD_lo
FodderGrass_SabarmatiR_RFD_hi
FodderGrass_SabarmatiR_RFD_lo
FodderGrass_Salinas_IRR_hi
FodderGrass_Salinas_IRR_lo
FodderGrass_Salinas_RFD_hi
FodderGrass_Salinas_RFD_lo
FodderGrass_Salween_RFD_hi
FodderGrass_Salween_RFD_lo
FodderGrass_ScheldtR_IRR_hi
FodderGrass_ScheldtR_IRR_lo
FodderGrass_ScheldtR_RFD_hi
FodderGrass_ScheldtR_RFD_lo
FodderGrass_SChinaSea_RFD_hi
FodderGrass_SChinaSea_RFD_lo
FodderGrass_ScndnvN_IRR_hi
FodderGrass_ScndnvN_IRR_lo
FodderGrass_ScndnvN_RFD_hi
FodderGrass_ScndnvN_RFD_lo
FodderGrass_SeineR_IRR_hi
FodderGrass_SeineR_IRR_lo
FodderGrass_SeineR_RFD_hi
FodderGrass_SeineR_RFD_lo
FodderGrass_SiberiaW_RFD_hi
FodderGrass_SiberiaW_RFD_lo
FodderGrass_SinaiP_RFD_hi
FodderGrass_SinaiP_RFD_lo
FodderGrass_SittaungR_RFD_hi
FodderGrass_SittaungR_RFD_lo
FodderGrass_SpainCstSE_IRR_hi
FodderGrass_SpainCstSE_IRR_lo
FodderGrass_SpainCstSE_RFD_hi
FodderGrass_SpainCstSE_RFD_lo
FodderGrass_Sweden_IRR_hi
FodderGrass_Sweden_IRR_lo

OtherGrainC4_Gironde
OtherGrainC4_Gobi
OtherGrainC4_GodavariR
OtherGrainC4_GreatBasin
OtherGrainC4_GreatLakes
OtherGrainC4_GrijUsuR
OtherGrainC4_GuadalqR
OtherGrainC4_GuadianaR
OtherGrainC4_GuineaGulf
OtherGrainC4_Hainan
OtherGrainC4_HamuMashR
OtherGrainC4_Helmand
OtherGrainC4_Hong
OtherGrainC4_HuangHeR
OtherGrainC4_IberiaCst
OtherGrainC4_IndCstE
OtherGrainC4_IndCstNE
OtherGrainC4_IndCstS
OtherGrainC4_IndCstW
OtherGrainC4_IndusR
OtherGrainC4_Iran
OtherGrainC4_IrianJaya
OtherGrainC4_IrrawaddyR
OtherGrainC4_ItalyCstE
OtherGrainC4_ItalyCstW
OtherGrainC4_Japan
OtherGrainC4_Korea
OtherGrainC4_KrishnaR
OtherGrainC4_LaPuna
OtherGrainC4_LBalkash
OtherGrainC4_LChad
OtherGrainC4_LenaR
OtherGrainC4_LimpopoR
OtherGrainC4_LoireR
OtherGrainC4_Madagascar
OtherGrainC4_MagdalenaR
OtherGrainC4_MahanadiR
OtherGrainC4_MahiR
OtherGrainC4_MalaysiaP
OtherGrainC4_MarChiq
OtherGrainC4_MeditE
OtherGrainC4_MeditIsl
OtherGrainC4_MeditS
OtherGrainC4_Mekong
OtherGrainC4_MexBaja
OtherGrainC4_MexCstNW
OtherGrainC4_MexCstW
OtherGrainC4_MexGulf
OtherGrainC4_MexInt
OtherGrainC4_MissouriR
OtherGrainC4_MissppRN
OtherGrainC4_MissppRS
OtherGrainC4_MurrayDrlg
OtherGrainC4_NarmadaR
OtherGrainC4_NarvaR
OtherGrainC4_NegroR
OtherGrainC4_NelsonR
OtherGrainC4_NemanR
OtherGrainC4_NevaR
OtherGrainC4_NewCaledn
OtherGrainC4_NigerR
OtherGrainC4_NileR
OtherGrainC4_ObR
OtherGrainC4_OderR
OtherGrainC4_OhioR
OtherGrainC4_OrangeR
OtherGrainC4_OrinocoR
OtherGrainC4_Pampas
OtherGrainC4_Papaloapan
OtherGrainC4_PapuaCst
OtherGrainC4_ParnaibaR
OtherGrainC4_Patagonia
OtherGrainC4_PennarR
OtherGrainC4_PersianGulf
OtherGrainC4_PeruCst
OtherGrainC4_Phlppns
OtherGrainC4_PolandCst
OtherGrainC4_PoR
OtherGrainC4_RedSeaE
OtherGrainC4_RhineR
OtherGrainC4_RhoneR
OtherGrainC4_RiftValley
OtherGrainC4_RioBalsas
OtherGrainC4_RioGrande
OtherGrainC4_RioLaPlata
OtherGrainC4_RioLerma
OtherGrainC4_RioVerde
OtherGrainC4_RusCstSE
OtherGrainC4_SabarmatiR
OtherGrainC4_Salinas
OtherGrainC4_Salween
OtherGrainC4_SAmerCstN
OtherGrainC4_SAmerCstNE
OtherGrainC4_SaoFrancR
OtherGrainC4_ScheldtR
OtherGrainC4_SChinaSea

FodderGrass_Sweden_RFD_hi
FodderGrass_Sweden_RFD_lo
FodderGrass_SyrDaryaR_IRR_hi
FodderGrass_SyrDaryaR_IRR_lo
FodderGrass_SyrDaryaR_RFD_hi
FodderGrass_SyrDaryaR_RFD_lo
FodderGrass_TagusR_IRR_hi
FodderGrass_TagusR_IRR_lo
FodderGrass_TagusR_RFD_hi
FodderGrass_TagusR_RFD_lo
FodderGrass_Taiwan_RFD_hi
FodderGrass_Taiwan_RFD_lo
FodderGrass_TaptiR_RFD_hi
FodderGrass_TaptiR_RFD_lo
FodderGrass_Tarim_RFD_hi
FodderGrass_Tarim_RFD_lo
FodderGrass_Tasmania_IRR_hi
FodderGrass_Tasmania_IRR_lo
FodderGrass_Tasmania_RFD_hi
FodderGrass_Tasmania_RFD_lo
FodderGrass_Tehuantpc_IRR_hi
FodderGrass_Tehuantpc_IRR_lo
FodderGrass_Tehuantpc_RFD_hi
FodderGrass_Tehuantpc_RFD_lo
FodderGrass_TennR_IRR_hi
FodderGrass_TennR_IRR_lo
FodderGrass_TennR_RFD_hi
FodderGrass_TennR_RFD_lo
FodderGrass_TexasCst_IRR_hi
FodderGrass_TexasCst_IRR_lo
FodderGrass_TexasCst_RFD_hi
FodderGrass_TexasCst_RFD_lo
FodderGrass_ThaiGulf_RFD_hi
FodderGrass_ThaiGulf_RFD_lo
FodderGrass_TiberR_IRR_hi
FodderGrass_TiberR_IRR_lo
FodderGrass_TiberR_RFD_hi
FodderGrass_TiberR_RFD_lo
FodderGrass_TigrEuphR_RFD_hi
FodderGrass_TigrEuphR_RFD_lo
FodderGrass_UralR_IRR_hi
FodderGrass_UralR_IRR_lo
FodderGrass_UralR_RFD_hi
FodderGrass_UralR_RFD_lo
FodderGrass_UsaColoRN_IRR_hi
FodderGrass_UsaColoRN_IRR_lo
FodderGrass_UsaColoRN_RFD_hi
FodderGrass_UsaColoRN_RFD_lo
FodderGrass_UsaColoRS_IRR_hi
FodderGrass_UsaColoRS_IRR_lo
FodderGrass_UsaColoRS_RFD_hi
FodderGrass_UsaColoRS_RFD_lo
FodderGrass_UsaCstE_IRR_hi
FodderGrass_UsaCstE_IRR_lo
FodderGrass_UsaCstE_RFD_hi
FodderGrass_UsaCstE_RFD_lo
FodderGrass_UsaCstNE_IRR_hi
FodderGrass_UsaCstNE_IRR_lo
FodderGrass_UsaCstNE_RFD_hi
FodderGrass_UsaCstNE_RFD_lo
FodderGrass_UsaCstSE_IRR_hi
FodderGrass_UsaCstSE_IRR_lo
FodderGrass_UsaCstSE_RFD_hi
FodderGrass_UsaCstSE_RFD_lo
FodderGrass_UsaPacNW_IRR_hi
FodderGrass_UsaPacNW_IRR_lo
FodderGrass_UsaPacNW_RFD_hi
FodderGrass_UsaPacNW_RFD_lo
FodderGrass_VolgaR_IRR_hi
FodderGrass_VolgaR_IRR_lo
FodderGrass_VolgaR_RFD_hi
FodderGrass_VolgaR_RFD_lo
FodderGrass_WislaR_IRR_hi
FodderGrass_WislaR_IRR_lo
FodderGrass_WislaR_RFD_hi
FodderGrass_WislaR_RFD_lo
FodderGrass_XunJiang_RFD_hi
FodderGrass_XunJiang_RFD_lo
FodderGrass_Yangtze_RFD_hi
FodderGrass_Yangtze_RFD_lo
FodderGrass_YeniseiR_IRR_hi
FodderGrass_YeniseiR_IRR_lo
FodderGrass_YeniseiR_RFD_hi
FodderGrass_YeniseiR_RFD_lo
FodderGrass_YucatanP_IRR_hi
FodderGrass_YucatanP_IRR_lo
FodderGrass_YucatanP_RFD_hi
FodderGrass_YucatanP_RFD_lo
FodderGrass_ZiyaHe_RFD_hi
FodderGrass_ZiyaHe_RFD_lo
FodderHerb_AdrBlkSea_IRR_hi
FodderHerb_AdrBlkSea_IRR_lo
FodderHerb_AdrBlkSea_RFD_hi
FodderHerb_AdrBlkSea_RFD_lo
FodderHerb_AfrCstNE_IRR_hi
FodderHerb_AfrCstNE_IRR_lo

OtherGrainC4_SeineR
OtherGrainC4_SenegalR
OtherGrainC4_SepikR
OtherGrainC4_ShebJubR
OtherGrainC4_SiberiaW
OtherGrainC4_SinaiP
OtherGrainC4_SittaungR
OtherGrainC4_SpainCstSE
OtherGrainC4_SriLanka
OtherGrainC4_SyrDaryaR
OtherGrainC4_TagusR
OtherGrainC4_Taiwan
OtherGrainC4_TaptiR
OtherGrainC4_Tarim
OtherGrainC4_Tasmania
OtherGrainC4_Tehuantpc
OtherGrainC4_TennR
OtherGrainC4_TexasCst
OtherGrainC4_ThaiGulf
OtherGrainC4_TiberR
OtherGrainC4_TigrEuphR
OtherGrainC4_TocantinsR
OtherGrainC4_UralR
OtherGrainC4_UsaColoRN
OtherGrainC4_UsaColoRS
OtherGrainC4_UsaCstE
OtherGrainC4_UsaCstSE
OtherGrainC4_UsaPacNW
OtherGrainC4_VietnamCst
OtherGrainC4_VolgaR
OtherGrainC4_VoltaR
OtherGrainC4_WislaR
OtherGrainC4_XunJiang
OtherGrainC4_Yangtze
OtherGrainC4_YeniseiR
OtherGrainC4_YucatanP
OtherGrainC4_ZambeziR
OtherGrainC4_ZiyaHe
Passenger Rail
Pastoral
refined liquids
Rice_AdrBlkSea
Rice_AfrCstE
Rice_AfrCstNE
Rice_AfrCstNW
Rice_AfrCstS
Rice_AfrCstSE
Rice_AfrCstSSW
Rice_AfrCstW
Rice_AfrIntN
Rice_AfrIntS
Rice_AmazonR
Rice_AmuDaryaR
Rice_AmurR
Rice_AngolaCst
Rice_ArabianSea
Rice_ArgColoR
Rice_ArgCstN
Rice_ArkWhtRedR
Rice_AusCstE
Rice_BengalBay
Rice_BengalW
Rice_BlackSeaN
Rice_BlackSeaS
Rice_BoHai
Rice_BorneoCstN
Rice_BrahmaniR
Rice_BrzCstE
Rice_BrzCstN
Rice_BrzCstS
Rice_California
Rice_Caribbean
Rice_CaspianE
Rice_CaspianNE
Rice_CaspianSW
Rice_CauveryR
Rice_ChaoPhrR
Rice_ChileCstN
Rice_ChileCstS
Rice_ChinaCst
Rice_CntAmer
Rice_ColEcuaCst
Rice_CongoR
Rice_DanubeR
Rice_DnieperR
Rice_DniesterR
Rice_DonR
Rice_DouroR
Rice_EbroR
Rice_FarahrudR
Rice_FlyR
Rice_FranceCstS
Rice_FranceCstW
Rice_GangesR
Rice_Gironde
Rice_Gobi
FodderHerb_AfrCstNE_RFD_hi
FodderHerb_AfrCstNE_RFD_lo
FodderHerb_AfrCstNW_IRR_hi
FodderHerb_AfrCstNW_IRR_lo
FodderHerb_AfrCstNW_RFD_hi
FodderHerb_AfrCstNW_RFD_lo
FodderHerb_AfrCstS_IRR_hi
FodderHerb_AfrCstS_IRR_lo
FodderHerb_AfrCstS_RFD_hi
FodderHerb_AfrCstS_RFD_lo
FodderHerb_AfrCstSSW_IRR_hi
FodderHerb_AfrCstSSW_IRR_lo
FodderHerb_AfrCstSSW_RFD_hi
FodderHerb_AfrCstSSW_RFD_lo
FodderHerb_AfrIntN_IRR_hi
FodderHerb_AfrIntN_IRR_lo
FodderHerb_AfrIntN_RFD_hi
FodderHerb_AfrIntN_RFD_lo
FodderHerb_AmazonR_RFD_hi
FodderHerb_AmazonR_RFD_lo
FodderHerb_AmuDaryaR_IRR_hi
FodderHerb_AmuDaryaR_IRR_lo
FodderHerb_AmuDaryaR_RFD_hi
FodderHerb_AmuDaryaR_RFD_lo
FodderHerb_AmurR_IRR_hi
FodderHerb_AmurR_IRR_lo
FodderHerb_AmurR_RFD_hi
FodderHerb_AmurR_RFD_lo
FodderHerb_ArabianP_IRR_hi
FodderHerb_ArabianP_IRR_lo
FodderHerb_ArabianP_RFD_hi
FodderHerb_ArabianP_RFD_lo
FodderHerb_ArabianSea_RFD_hi
FodderHerb_ArabianSea_RFD_lo
FodderHerb_ArgColoR_IRR_hi
FodderHerb_ArgColoR_IRR_lo
FodderHerb_ArgColoR_RFD_hi
FodderHerb_ArgColoR_RFD_lo
FodderHerb_ArgCstN_IRR_hi
FodderHerb_ArgCstN_IRR_lo
FodderHerb_ArgCstN_RFD_hi
FodderHerb_ArgCstN_RFD_lo
FodderHerb_ArgCstS_IRR_hi
FodderHerb_ArgCstS_IRR_lo
FodderHerb_ArgCstS_RFD_hi
FodderHerb_ArgCstS_RFD_lo
FodderHerb_ArkWhtRedR_IRR_hi
FodderHerb_ArkWhtRedR_IRR_lo
FodderHerb_ArkWhtRedR_RFD_hi
FodderHerb_ArkWhtRedR_RFD_lo
FodderHerb_AusCstE_IRR_hi
FodderHerb_AusCstE_IRR_lo
FodderHerb_AusCstE_RFD_hi
FodderHerb_AusCstE_RFD_lo
FodderHerb_AusCstN_IRR_hi
FodderHerb_AusCstN_IRR_lo
FodderHerb_AusCstN_RFD_hi
FodderHerb_AusCstN_RFD_lo
FodderHerb_AusCstS_IRR_hi
FodderHerb_AusCstS_IRR_lo
FodderHerb_AusCstS_RFD_hi
FodderHerb_AusCstS_RFD_lo
FodderHerb_AusCstW_IRR_hi
FodderHerb_AusCstW_IRR_lo
FodderHerb_AusCstW_RFD_hi
FodderHerb_AusCstW_RFD_lo
FodderHerb_AusInt_IRR_hi
FodderHerb_AusInt_IRR_lo
FodderHerb_AusInt_RFD_hi
FodderHerb_AusInt_RFD_lo
FodderHerb_BalticSea_IRR_hi
FodderHerb_BalticSea_IRR_lo
FodderHerb_BalticSea_RFD_hi
FodderHerb_BalticSea_RFD_lo
FodderHerb_BarentsSea_IRR_hi
FodderHerb_BarentsSea_IRR_lo
FodderHerb_BarentsSea_RFD_hi
FodderHerb_BarentsSea_RFD_lo
FodderHerb_BlackSeaN_IRR_hi
FodderHerb_BlackSeaN_IRR_lo
FodderHerb_BlackSeaN_RFD_hi
FodderHerb_BlackSeaN_RFD_lo
FodderHerb_BlackSeaS_IRR_hi
FodderHerb_BlackSeaS_IRR_lo
FodderHerb_BlackSeaS_RFD_hi
FodderHerb_BlackSeaS_RFD_lo
FodderHerb_California_IRR_hi
FodderHerb_California_IRR_lo
FodderHerb_California_RFD_hi
FodderHerb_California_RFD_lo
FodderHerb_CaspianE_IRR_hi
FodderHerb_CaspianE_IRR_lo
FodderHerb_CaspianE_RFD_hi
FodderHerb_CaspianE_RFD_lo
FodderHerb_CaspianNE_IRR_hi
FodderHerb_CaspianNE_IRR_lo

| | |
|---|---|
| Rice_GodavariR | FodderHerb_CaspianNE_RFD_hi |
| Rice_GrijUsuR | FodderHerb_CaspianNE_RFD_lo |
| Rice_GuadalqR | FodderHerb_CaspianSW_IRR_hi |
| Rice_GuadianaR | FodderHerb_CaspianSW_IRR_lo |
| Rice_GuineaGulf | FodderHerb_CaspianSW_RFD_hi |
| Rice_Hainan | FodderHerb_CaspianSW_RFD_lo |
| Rice_HamuMashR | FodderHerb_ChileCstN_RFD_hi |
| Rice_Helmand | FodderHerb_ChileCstN_RFD_lo |
| Rice_Hong | FodderHerb_ChileCstS_IRR_hi |
| Rice_HuangHeR | FodderHerb_ChileCstS_IRR_lo |
| Rice_IberiaCst | FodderHerb_ChileCstS_RFD_hi |
| Rice_IdnE | FodderHerb_ChileCstS_RFD_lo |
| Rice_IndCstE | FodderHerb_CntAmer_IRR_hi |
| Rice_IndCstNE | FodderHerb_CntAmer_IRR_lo |
| Rice_IndCstS | FodderHerb_CntAmer_RFD_hi |
| Rice_IndCstW | FodderHerb_CntAmer_RFD_lo |
| Rice_IndusR | FodderHerb_ColEcuaCst_RFD_hi |
| Rice_Iran | FodderHerb_ColEcuaCst_RFD_lo |
| Rice_IrianJaya | FodderHerb_DanubeR_IRR_hi |
| Rice_IrrawaddyR | FodderHerb_DanubeR_IRR_lo |
| Rice_ItalyCstE | FodderHerb_DanubeR_RFD_hi |
| Rice_ItalyCstW | FodderHerb_DanubeR_RFD_lo |
| Rice_Japan | FodderHerb_DaugavaR_IRR_hi |
| Rice_JavaTimor | FodderHerb_DaugavaR_IRR_lo |
| Rice_Kalimantan | FodderHerb_DaugavaR_RFD_hi |
| Rice_Korea | FodderHerb_DaugavaR_RFD_lo |
| Rice_KrishnaR | FodderHerb_DeadSea_IRR_hi |
| Rice_LaPuna | FodderHerb_DeadSea_IRR_lo |
| Rice_LBalkash | FodderHerb_DeadSea_RFD_hi |
| Rice_LChad | FodderHerb_DeadSea_RFD_lo |
| Rice_LimpopoR | FodderHerb_DnieperR_IRR_hi |
| Rice_LoireR | FodderHerb_DnieperR_IRR_lo |
| Rice_Madagascar | FodderHerb_DnieperR_RFD_hi |
| Rice_MagdalenaR | FodderHerb_DnieperR_RFD_lo |
| Rice_MahanadiR | FodderHerb_DniesterR_IRR_hi |
| Rice_MahiR | FodderHerb_DniesterR_IRR_lo |
| Rice_MalaysiaP | FodderHerb_DniesterR_RFD_hi |
| Rice_MarChiq | FodderHerb_DniesterR_RFD_lo |
| Rice_MeditE | FodderHerb_DnkGrmCst_IRR_hi |
| Rice_MeditIsl | FodderHerb_DnkGrmCst_IRR_lo |
| Rice_MeditS | FodderHerb_DnkGrmCst_RFD_hi |
| Rice_Mekong | FodderHerb_DnkGrmCst_RFD_lo |
| Rice_MexCstNW | FodderHerb_DonR_IRR_hi |
| Rice_MexCstW | FodderHerb_DonR_IRR_lo |
| Rice_MexGulf | FodderHerb_DonR_RFD_hi |
| Rice_MissppRN | FodderHerb_DonR_RFD_lo |
| Rice_MissppRS | FodderHerb_DouroR_IRR_hi |
| Rice_MurrayDrlg | FodderHerb_DouroR_IRR_lo |
| Rice_NarmadaR | FodderHerb_DouroR_RFD_hi |
| Rice_NegroR | FodderHerb_DouroR_RFD_lo |
| Rice_NewCaledn | FodderHerb_DvinaRN_IRR_hi |
| Rice_NigerR | FodderHerb_DvinaRN_IRR_lo |
| Rice_NileR | FodderHerb_DvinaRN_RFD_hi |
| Rice_ObR | FodderHerb_DvinaRN_RFD_lo |
| Rice_OrangeR | FodderHerb_EbroR_IRR_hi |
| Rice_OrinocoR | FodderHerb_EbroR_IRR_lo |
| Rice_Pampas | FodderHerb_EbroR_RFD_hi |
| Rice_Papaloapan | FodderHerb_EbroR_RFD_lo |
| Rice_PapuaCst | FodderHerb_EJrdnSyr_IRR_hi |
| Rice_ParnaibaR | FodderHerb_EJrdnSyr_IRR_lo |
| Rice_PennarR | FodderHerb_EJrdnSyr_RFD_hi |
| Rice_PersianGulf | FodderHerb_EJrdnSyr_RFD_lo |
| Rice_PeruCst | FodderHerb_ElbeR_IRR_hi |
| Rice_Phlppns | FodderHerb_ElbeR_IRR_lo |
| Rice_PoR | FodderHerb_ElbeR_RFD_hi |
| Rice_RhoneR | FodderHerb_ElbeR_RFD_lo |
| Rice_RiftValley | FodderHerb_EmsWeserR_IRR_hi |
| Rice_RioBalsas | FodderHerb_EmsWeserR_IRR_lo |
| Rice_RioLaPlata | FodderHerb_EmsWeserR_RFD_hi |
| Rice_RioLerma | FodderHerb_EmsWeserR_RFD_lo |
| Rice_RioVerde | FodderHerb_EngWales_IRR_hi |
| Rice_RusCstSE | FodderHerb_EngWales_IRR_lo |
| Rice_SabarmatiR | FodderHerb_EngWales_RFD_hi |
| Rice_Salinas | FodderHerb_EngWales_RFD_lo |
| Rice_Salween | FodderHerb_FarahrudR_RFD_hi |
| Rice_SAmerCstN | FodderHerb_FarahrudR_RFD_lo |
| Rice_SAmerCstNE | FodderHerb_Finland_IRR_hi |
| Rice_SaoFrancR | FodderHerb_Finland_IRR_lo |
| Rice_SChinaSea | FodderHerb_Finland_RFD_hi |
| Rice_SenegalR | FodderHerb_Finland_RFD_lo |
| Rice_SepikR | FodderHerb_FranceCstS_IRR_hi |
| Rice_ShebJubR | FodderHerb_FranceCstS_IRR_lo |
| Rice_SinaiP | FodderHerb_FranceCstS_RFD_hi |
| Rice_SittaungR | FodderHerb_FranceCstS_RFD_lo |
| Rice_SolomonIsl | FodderHerb_FranceCstW_IRR_hi |
| Rice_SpainCstSE | FodderHerb_FranceCstW_IRR_lo |
| Rice_SriLanka | FodderHerb_FranceCstW_RFD_hi |
| Rice_Sulawesi | FodderHerb_FranceCstW_RFD_lo |
| Rice_Sumatra | FodderHerb_FraserR_IRR_hi |
| Rice_SyrDaryaR | FodderHerb_FraserR_IRR_lo |
| Rice_TagusR | FodderHerb_FraserR_RFD_hi |
| Rice_Taiwan | FodderHerb_FraserR_RFD_lo |
| Rice_TaptiR | FodderHerb_Gironde_IRR_hi |
| Rice_Tarim | FodderHerb_Gironde_IRR_lo |
| Rice_Tehuantpc | FodderHerb_Gironde_RFD_hi |
| Rice_TexasCst | FodderHerb_Gironde_RFD_lo |

Rice_ThaiGulf
Rice_TiberR
Rice_TigrEuphR
Rice_TocantinsR
Rice_UsaCstSE
Rice_VietnamCst
Rice_VolgaR
Rice_VoltaR
Rice_WislaR
Rice_XunJiang
Rice_Yangtze
Rice_YeniseiR
Rice_YucatanP
Rice_ZambeziR
Rice_ZiyaHe
RootTuber_AdrBlkSea
RootTuber_AfrCstE
RootTuber_AfrCstNE
RootTuber_AfrCstNW
RootTuber_AfrCstS
RootTuber_AfrCstSE
RootTuber_AfrCstSSW
RootTuber_AfrCstSW
RootTuber_AfrCstW
RootTuber_AfrIntN
RootTuber_AfrIntS
RootTuber_AmazonR
RootTuber_AmuDaryaR
RootTuber_AmurR
RootTuber_AngolaCst
RootTuber_ArabianP
RootTuber_ArabianSea
RootTuber_ArgColoR
RootTuber_ArgCstN
RootTuber_ArgCstS
RootTuber_ArkWhtRedR
RootTuber_AusCstE
RootTuber_AusCstN
RootTuber_AusCstS
RootTuber_AusCstW
RootTuber_AusInt
RootTuber_BalticSea
RootTuber_BarentsSea
RootTuber_BengalBay
RootTuber_BengalW
RootTuber_BlackSeaN
RootTuber_BlackSeaS
RootTuber_BoHai
RootTuber_BorneoCstN
RootTuber_BrahmaniR
RootTuber_BrzCstE
RootTuber_BrzCstN
RootTuber_BrzCstS
RootTuber_California
RootTuber_CanAtl
RootTuber_Caribbean
RootTuber_CaspianE
RootTuber_CaspianNE
RootTuber_CaspianSW
RootTuber_CauveryR
RootTuber_ChaoPhrR
RootTuber_ChileCstN
RootTuber_ChileCstS
RootTuber_ChinaCst
RootTuber_CntAmer
RootTuber_ColEcuaCst
RootTuber_CongoR
RootTuber_DanubeR
RootTuber_DaugavaR
RootTuber_DeadSea
RootTuber_DnieperR
RootTuber_DniesterR
RootTuber_DnkGrmCst
RootTuber_DonR
RootTuber_DouroR
RootTuber_DvinaRN
RootTuber_EbroR
RootTuber_EJrdnSyr
RootTuber_ElbeR
RootTuber_EmsWeserR
RootTuber_EngWales
RootTuber_FarahrudR
RootTuber_Finland
RootTuber_FlyR
RootTuber_FranceCstS
RootTuber_FranceCstW
RootTuber_FraserR
RootTuber_GangesR
RootTuber_Gironde
RootTuber_Gobi
RootTuber_GodavariR
RootTuber_GreatBasin
RootTuber_GreatLakes
RootTuber_GrijUsuR
RootTuber_GuadalqR
RootTuber_GuadianaR
FodderHerb_Gobi_IRR_hi
FodderHerb_Gobi_IRR_lo
FodderHerb_Gobi_RFD_hi
FodderHerb_Gobi_RFD_lo
FodderHerb_GreatBasin_IRR_hi
FodderHerb_GreatBasin_IRR_lo
FodderHerb_GreatBasin_RFD_hi
FodderHerb_GreatBasin_RFD_lo
FodderHerb_GreatLakes_IRR_hi
FodderHerb_GreatLakes_IRR_lo
FodderHerb_GreatLakes_RFD_hi
FodderHerb_GreatLakes_RFD_lo
FodderHerb_GrijUsuR_IRR_hi
FodderHerb_GrijUsuR_IRR_lo
FodderHerb_GrijUsuR_RFD_hi
FodderHerb_GrijUsuR_RFD_lo
FodderHerb_GuadalqR_IRR_hi
FodderHerb_GuadalqR_IRR_lo
FodderHerb_GuadalqR_RFD_hi
FodderHerb_GuadalqR_RFD_lo
FodderHerb_GuadianaR_IRR_hi
FodderHerb_GuadianaR_IRR_lo
FodderHerb_GuadianaR_RFD_hi
FodderHerb_GuadianaR_RFD_lo
FodderHerb_HamuMashR_RFD_hi
FodderHerb_HamuMashR_RFD_lo
FodderHerb_Helmand_RFD_hi
FodderHerb_Helmand_RFD_lo
FodderHerb_Hong_IRR_hi
FodderHerb_Hong_IRR_lo
FodderHerb_Hong_RFD_hi
FodderHerb_Hong_RFD_lo
FodderHerb_IberiaCst_IRR_hi
FodderHerb_IberiaCst_IRR_lo
FodderHerb_IberiaCst_RFD_hi
FodderHerb_IberiaCst_RFD_lo
FodderHerb_Iran_RFD_hi
FodderHerb_Iran_RFD_lo
FodderHerb_Ireland_IRR_hi
FodderHerb_Ireland_IRR_lo
FodderHerb_Ireland_RFD_hi
FodderHerb_Ireland_RFD_lo
FodderHerb_ItalyCstE_IRR_hi
FodderHerb_ItalyCstE_IRR_lo
FodderHerb_ItalyCstE_RFD_hi
FodderHerb_ItalyCstE_RFD_lo
FodderHerb_ItalyCstW_IRR_hi
FodderHerb_ItalyCstW_IRR_lo
FodderHerb_ItalyCstW_RFD_hi
FodderHerb_ItalyCstW_RFD_lo
FodderHerb_Japan_IRR_hi
FodderHerb_Japan_IRR_lo
FodderHerb_Japan_RFD_hi
FodderHerb_Japan_RFD_lo
FodderHerb_LaPuna_RFD_hi
FodderHerb_LaPuna_RFD_lo
FodderHerb_LBalkash_IRR_hi
FodderHerb_LBalkash_IRR_lo
FodderHerb_LBalkash_RFD_hi
FodderHerb_LBalkash_RFD_lo
FodderHerb_LenaR_IRR_hi
FodderHerb_LenaR_IRR_lo
FodderHerb_LenaR_RFD_hi
FodderHerb_LenaR_RFD_lo
FodderHerb_LimpopoR_IRR_hi
FodderHerb_LimpopoR_IRR_lo
FodderHerb_LimpopoR_RFD_hi
FodderHerb_LimpopoR_RFD_lo
FodderHerb_LoireR_IRR_hi
FodderHerb_LoireR_IRR_lo
FodderHerb_LoireR_RFD_hi
FodderHerb_LoireR_RFD_lo
FodderHerb_MarChiq_IRR_hi
FodderHerb_MarChiq_IRR_lo
FodderHerb_MarChiq_RFD_hi
FodderHerb_MarChiq_RFD_lo
FodderHerb_MeditE_IRR_hi
FodderHerb_MeditE_IRR_lo
FodderHerb_MeditE_RFD_hi
FodderHerb_MeditE_RFD_lo
FodderHerb_MeditIsl_IRR_hi
FodderHerb_MeditIsl_IRR_lo
FodderHerb_MeditIsl_RFD_hi
FodderHerb_MeditIsl_RFD_lo
FodderHerb_MeditS_IRR_hi
FodderHerb_MeditS_IRR_lo
FodderHerb_MeditS_RFD_hi
FodderHerb_MeditS_RFD_lo
FodderHerb_Mekong_IRR_hi
FodderHerb_Mekong_IRR_lo
FodderHerb_Mekong_RFD_hi
FodderHerb_Mekong_RFD_lo
FodderHerb_MexBaja_IRR_hi
FodderHerb_MexBaja_IRR_lo
FodderHerb_MexBaja_RFD_hi
FodderHerb_MexBaja_RFD_lo

RootTuber_GuineaGulf
RootTuber_Hainan
RootTuber_HamuMashR
RootTuber_Helmand
RootTuber_Hong
RootTuber_HuangHeR
RootTuber_HudsonBay
RootTuber_IberiaCst
RootTuber_Iceland
RootTuber_IdnE
RootTuber_IndCstE
RootTuber_IndCstNE
RootTuber_IndCstS
RootTuber_IndCstW
RootTuber_IndusR
RootTuber_Iran
RootTuber_Ireland
RootTuber_IrianJaya
RootTuber_IrrawaddyR
RootTuber_ItalyCstE
RootTuber_ItalyCstW
RootTuber_Japan
RootTuber_JavaTimor
RootTuber_Kalimantan
RootTuber_Korea
RootTuber_KrishnaR
RootTuber_LaPuna
RootTuber_LBalkash
RootTuber_LChad
RootTuber_LenaR
RootTuber_LimpopoR
RootTuber_LoireR
RootTuber_Mackenzie
RootTuber_Madagascar
RootTuber_MagdalenaR
RootTuber_MahanadiR
RootTuber_MahiR
RootTuber_MalaysiaP
RootTuber_MarChiq
RootTuber_MeditE
RootTuber_MeditIsl
RootTuber_MeditS
RootTuber_Mekong
RootTuber_MexBaja
RootTuber_MexCstNW
RootTuber_MexCstW
RootTuber_MexGulf
RootTuber_MexInt
RootTuber_MissouriR
RootTuber_MissppRN
RootTuber_MissppRS
RootTuber_MurrayDrlg
RootTuber_NarmadaR
RootTuber_NarvaR
RootTuber_NegroR
RootTuber_NelsonR
RootTuber_NemanR
RootTuber_NevaR
RootTuber_NewCaledn
RootTuber_NewZealand
RootTuber_NigerR
RootTuber_NileR
RootTuber_NWTerr
RootTuber_ObR
RootTuber_OderR
RootTuber_OhioR
RootTuber_OrangeR
RootTuber_OrinocoR
RootTuber_PacArctic
RootTuber_Pampas
RootTuber_Papaloapan
RootTuber_PapuaCst
RootTuber_ParnaibaR
RootTuber_PennarR
RootTuber_PersianGulf
RootTuber_PeruCst
RootTuber_Phlppns
RootTuber_PolandCst
RootTuber_PoR
RootTuber_RedSeaE
RootTuber_RhineR
RootTuber_RhoneR
RootTuber_RiftValley
RootTuber_RioBalsas
RootTuber_RioGrande
RootTuber_RioLaPlata
RootTuber_RioLerma
RootTuber_RioVerde
RootTuber_RusCstSE
RootTuber_SabarmatiR
RootTuber_Salinas
RootTuber_Salween
RootTuber_SAmerCstN
RootTuber_SAmerCstNE
RootTuber_SaoFrancR
RootTuber_ScheldtR

FodderHerb_MexCstNW_IRR_hi
FodderHerb_MexCstNW_IRR_lo
FodderHerb_MexCstNW_RFD_hi
FodderHerb_MexCstNW_RFD_lo
FodderHerb_MexCstW_IRR_hi
FodderHerb_MexCstW_IRR_lo
FodderHerb_MexCstW_RFD_hi
FodderHerb_MexCstW_RFD_lo
FodderHerb_MexGulf_IRR_hi
FodderHerb_MexGulf_IRR_lo
FodderHerb_MexGulf_RFD_hi
FodderHerb_MexGulf_RFD_lo
FodderHerb_MexInt_IRR_hi
FodderHerb_MexInt_IRR_lo
FodderHerb_MexInt_RFD_hi
FodderHerb_MexInt_RFD_lo
FodderHerb_MissouriR_IRR_hi
FodderHerb_MissouriR_IRR_lo
FodderHerb_MissouriR_RFD_hi
FodderHerb_MissouriR_RFD_lo
FodderHerb_MissppRN_IRR_hi
FodderHerb_MissppRN_IRR_lo
FodderHerb_MissppRN_RFD_hi
FodderHerb_MissppRN_RFD_lo
FodderHerb_MissppRS_IRR_hi
FodderHerb_MissppRS_IRR_lo
FodderHerb_MissppRS_RFD_hi
FodderHerb_MissppRS_RFD_lo
FodderHerb_MurrayDrlg_IRR_hi
FodderHerb_MurrayDrlg_IRR_lo
FodderHerb_MurrayDrlg_RFD_hi
FodderHerb_MurrayDrlg_RFD_lo
FodderHerb_NarvaR_IRR_hi
FodderHerb_NarvaR_IRR_lo
FodderHerb_NarvaR_RFD_hi
FodderHerb_NarvaR_RFD_lo
FodderHerb_NegroR_IRR_hi
FodderHerb_NegroR_IRR_lo
FodderHerb_NegroR_RFD_hi
FodderHerb_NegroR_RFD_lo
FodderHerb_NelsonR_IRR_hi
FodderHerb_NelsonR_IRR_lo
FodderHerb_NelsonR_RFD_hi
FodderHerb_NelsonR_RFD_lo
FodderHerb_NemanR_IRR_hi
FodderHerb_NemanR_IRR_lo
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FodderHerb_NemanR_RFD_lo
FodderHerb_NevaR_IRR_hi
FodderHerb_NevaR_IRR_lo
FodderHerb_NevaR_RFD_hi
FodderHerb_NevaR_RFD_lo
FodderHerb_NewZealand_IRR_hi
FodderHerb_NewZealand_IRR_lo
FodderHerb_NewZealand_RFD_hi
FodderHerb_NewZealand_RFD_lo
FodderHerb_NileR_IRR_hi
FodderHerb_NileR_IRR_lo
FodderHerb_NileR_RFD_hi
FodderHerb_NileR_RFD_lo
FodderHerb_ObR_IRR_hi
FodderHerb_ObR_IRR_lo
FodderHerb_ObR_RFD_hi
FodderHerb_ObR_RFD_lo
FodderHerb_OderR_IRR_hi
FodderHerb_OderR_IRR_lo
FodderHerb_OderR_RFD_hi
FodderHerb_OderR_RFD_lo
FodderHerb_OhioR_IRR_hi
FodderHerb_OhioR_IRR_lo
FodderHerb_OhioR_RFD_hi
FodderHerb_OhioR_RFD_lo
FodderHerb_OrangeR_IRR_hi
FodderHerb_OrangeR_IRR_lo
FodderHerb_OrangeR_RFD_hi
FodderHerb_OrangeR_RFD_lo
FodderHerb_Pampas_IRR_hi
FodderHerb_Pampas_IRR_lo
FodderHerb_Pampas_RFD_hi
FodderHerb_Pampas_RFD_lo
FodderHerb_Papaloapan_IRR_hi
FodderHerb_Papaloapan_IRR_lo
FodderHerb_Papaloapan_RFD_hi
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FodderHerb_Patagonia_IRR_hi
FodderHerb_Patagonia_IRR_lo
FodderHerb_Patagonia_RFD_hi
FodderHerb_Patagonia_RFD_lo
FodderHerb_PersianGulf_RFD_hi
FodderHerb_PersianGulf_RFD_lo
FodderHerb_PeruCst_RFD_hi
FodderHerb_PeruCst_RFD_lo
FodderHerb_PolandCst_IRR_hi
FodderHerb_PolandCst_IRR_lo
FodderHerb_PolandCst_RFD_hi
FodderHerb_PolandCst_RFD_lo

RootTuber_SChinaSea
RootTuber_ScndnvN
RootTuber_Scotland
RootTuber_SeineR
RootTuber_SenegalR
RootTuber_SepikR
RootTuber_ShebJubR
RootTuber_SiberiaW
RootTuber_SinaiP
RootTuber_SittaungR
RootTuber_SolomonIsl
RootTuber_SpainCstSE
RootTuber_SriLanka
RootTuber_StLwrncR
RootTuber_Sulawesi
RootTuber_Sumatra
RootTuber_Sweden
RootTuber_SyrDaryaR
RootTuber_TagusR
RootTuber_Taiwan
RootTuber_TaptiR
RootTuber_Tarim
RootTuber_Tasmania
RootTuber_Tehuantpc
RootTuber_TennR
RootTuber_TexasCst
RootTuber_ThaiGulf
RootTuber_TiberR
RootTuber_TigrEuphR
RootTuber_TocantinsR
RootTuber_UralR
RootTuber_UsaColoRN
RootTuber_UsaColoRS
RootTuber_UsaCstE
RootTuber_UsaCstNE
RootTuber_UsaCstSE
RootTuber_UsaPacNW
RootTuber_VietnamCst
RootTuber_VolgaR
RootTuber_VoltaR
RootTuber_WislaR
RootTuber_XunJiang
RootTuber_Yangtze
RootTuber_YeniseiR
RootTuber_YucatanP
RootTuber_ZambeziR
RootTuber_ZiyaHe
semiconductors
solvents
Soybean_AdrBlkSea
Soybean_AfrCstE
Soybean_AfrCstNE
Soybean_AfrCstNW
Soybean_AfrCstS
Soybean_AfrCstSE
Soybean_AfrCstSSW
Soybean_AfrCstW
Soybean_AfrIntN
Soybean_AfrIntS
Soybean_AmazonR
Soybean_AmuDaryaR
Soybean_AmurR
Soybean_AngolaCst
Soybean_ArabianSea
Soybean_ArgColoR
Soybean_ArgCstN
Soybean_ArgCstS
Soybean_ArkWhtRedR
Soybean_AusCstE
Soybean_BalticSea
Soybean_BarentsSea
Soybean_BengalBay
Soybean_BengalW
Soybean_BlackSeaN
Soybean_BlackSeaS
Soybean_BoHai
Soybean_BorneoCstN
Soybean_BrahmaniR
Soybean_BrzCstE
Soybean_BrzCstN
Soybean_BrzCstS
Soybean_CanAtl
Soybean_CaspianE
Soybean_CaspianNE
Soybean_CaspianSW
Soybean_CauveryR
Soybean_ChaoPhrR
Soybean_ChinaCst
Soybean_CntAmer
Soybean_ColEcuaCst
Soybean_CongoR
Soybean_DanubeR
Soybean_DaugavaR
Soybean_DeadSea
Soybean_DnieperR
Soybean_DniesterR
FodderHerb_PoR_IRR_hi
FodderHerb_PoR_IRR_lo
FodderHerb_PoR_RFD_hi
FodderHerb_PoR_RFD_lo
FodderHerb_RedSeaE_IRR_hi
FodderHerb_RedSeaE_IRR_lo
FodderHerb_RedSeaE_RFD_hi
FodderHerb_RedSeaE_RFD_lo
FodderHerb_Residue
FodderHerb_RhineR_IRR_hi
FodderHerb_RhineR_IRR_lo
FodderHerb_RhineR_RFD_hi
FodderHerb_RhineR_RFD_lo
FodderHerb_RhoneR_IRR_hi
FodderHerb_RhoneR_IRR_lo
FodderHerb_RhoneR_RFD_hi
FodderHerb_RhoneR_RFD_lo
FodderHerb_RiftValley_IRR_hi
FodderHerb_RiftValley_IRR_lo
FodderHerb_RiftValley_RFD_hi
FodderHerb_RiftValley_RFD_lo
FodderHerb_RioBalsas_IRR_hi
FodderHerb_RioBalsas_IRR_lo
FodderHerb_RioBalsas_RFD_hi
FodderHerb_RioBalsas_RFD_lo
FodderHerb_RioGrande_IRR_hi
FodderHerb_RioGrande_IRR_lo
FodderHerb_RioGrande_RFD_hi
FodderHerb_RioGrande_RFD_lo
FodderHerb_RioLaPlata_IRR_hi
FodderHerb_RioLaPlata_IRR_lo
FodderHerb_RioLaPlata_RFD_hi
FodderHerb_RioLaPlata_RFD_lo
FodderHerb_RioLerma_IRR_hi
FodderHerb_RioLerma_IRR_lo
FodderHerb_RioLerma_RFD_hi
FodderHerb_RioLerma_RFD_lo
FodderHerb_RioVerde_IRR_hi
FodderHerb_RioVerde_IRR_lo
FodderHerb_RioVerde_RFD_hi
FodderHerb_RioVerde_RFD_lo
FodderHerb_RusCstSE_IRR_hi
FodderHerb_RusCstSE_IRR_lo
FodderHerb_RusCstSE_RFD_hi
FodderHerb_RusCstSE_RFD_lo
FodderHerb_Salinas_IRR_hi
FodderHerb_Salinas_IRR_lo
FodderHerb_Salinas_RFD_hi
FodderHerb_Salinas_RFD_lo
FodderHerb_ScheldtR_IRR_hi
FodderHerb_ScheldtR_IRR_lo
FodderHerb_ScheldtR_RFD_hi
FodderHerb_ScheldtR_RFD_lo
FodderHerb_SChinaSea_IRR_hi
FodderHerb_SChinaSea_IRR_lo
FodderHerb_SChinaSea_RFD_hi
FodderHerb_SChinaSea_RFD_lo
FodderHerb_ScndnvN_IRR_hi
FodderHerb_ScndnvN_IRR_lo
FodderHerb_ScndnvN_RFD_hi
FodderHerb_ScndnvN_RFD_lo
FodderHerb_Scotland_IRR_hi
FodderHerb_Scotland_IRR_lo
FodderHerb_Scotland_RFD_hi
FodderHerb_Scotland_RFD_lo
FodderHerb_SeineR_IRR_hi
FodderHerb_SeineR_IRR_lo
FodderHerb_SeineR_RFD_hi
FodderHerb_SeineR_RFD_lo
FodderHerb_ShebJubR_IRR_hi
FodderHerb_ShebJubR_IRR_lo
FodderHerb_ShebJubR_RFD_hi
FodderHerb_ShebJubR_RFD_lo
FodderHerb_SiberiaW_RFD_hi
FodderHerb_SiberiaW_RFD_lo
FodderHerb_SinaiP_RFD_hi
FodderHerb_SinaiP_RFD_lo
FodderHerb_SpainCstSE_IRR_hi
FodderHerb_SpainCstSE_IRR_lo
FodderHerb_SpainCstSE_RFD_hi
FodderHerb_SpainCstSE_RFD_lo
FodderHerb_Sweden_IRR_hi
FodderHerb_Sweden_IRR_lo
FodderHerb_Sweden_RFD_hi
FodderHerb_Sweden_RFD_lo
FodderHerb_SyrDaryaR_IRR_hi
FodderHerb_SyrDaryaR_IRR_lo
FodderHerb_SyrDaryaR_RFD_hi
FodderHerb_SyrDaryaR_RFD_lo
FodderHerb_TagusR_IRR_hi
FodderHerb_TagusR_IRR_lo
FodderHerb_TagusR_RFD_hi
FodderHerb_TagusR_RFD_lo
FodderHerb_Taiwan_RFD_hi
FodderHerb_Taiwan_RFD_lo
FodderHerb_Tarim_RFD_hi

Soybean_DnkGrmCst
Soybean_DonR
Soybean_DvinaRN
Soybean_EbroR
Soybean_EJrdnSyr
Soybean_ElbeR
Soybean_EmsWeserR
Soybean_FarahrudR
Soybean_Finland
Soybean_FranceCstS
Soybean_FranceCstW
Soybean_GangesR
Soybean_Gironde
Soybean_Gobi
Soybean_GodavariR
Soybean_GreatLakes
Soybean_GrijUsuR
Soybean_GuadalqR
Soybean_GuadianaR
Soybean_GuineaGulf
Soybean_Hainan
Soybean_HamuMashR
Soybean_Helmand
Soybean_Hong
Soybean_HuangHeR
Soybean_HudsonBay
Soybean_IberiaCst
Soybean_IdnE
Soybean_IndCstE
Soybean_IndCstNE
Soybean_IndCstS
Soybean_IndCstW
Soybean_IndusR
Soybean_Iran
Soybean_IrianJaya
Soybean_IrrawaddyR
Soybean_ItalyCstE
Soybean_ItalyCstW
Soybean_Japan
Soybean_JavaTimor
Soybean_Kalimantan
Soybean_Korea
Soybean_KrishnaR
Soybean_LaPuna
Soybean_LBalkash
Soybean_LChad
Soybean_LenaR
Soybean_LimpopoR
Soybean_LoireR
Soybean_Mackenzie
Soybean_Madagascar
Soybean_MagdalenaR
Soybean_MahanadiR
Soybean_MahiR
Soybean_MalaysiaP
Soybean_MarChiq
Soybean_MeditE
Soybean_MeditS
Soybean_Mekong
Soybean_MexCstNW
Soybean_MexCstW
Soybean_MexGulf
Soybean_MexInt
Soybean_MissouriR
Soybean_MissppRN
Soybean_MissppRS
Soybean_MurrayDrlg
Soybean_NarmadaR
Soybean_NarvaR
Soybean_NegroR
Soybean_NelsonR
Soybean_NemanR
Soybean_NevaR
Soybean_NigerR
Soybean_NileR
Soybean_ObR
Soybean_OderR
Soybean_OhioR
Soybean_OrangeR
Soybean_OrinocoR
Soybean_Pampas
Soybean_ParnaibaR
Soybean_PennarR
Soybean_PersianGulf
Soybean_PeruCst
Soybean_Phlppns
Soybean_PolandCst
Soybean_PoR
Soybean_RhineR
Soybean_RhoneR
Soybean_RiftValley
Soybean_RioBalsas
Soybean_RioGrande
Soybean_RioLaPlata
Soybean_RioLerma
Soybean_RioVerde
FodderHerb_Tarim_RFD_lo
FodderHerb_Tasmania_IRR_hi
FodderHerb_Tasmania_IRR_lo
FodderHerb_Tasmania_RFD_hi
FodderHerb_Tasmania_RFD_lo
FodderHerb_Tehuantpc_IRR_hi
FodderHerb_Tehuantpc_IRR_lo
FodderHerb_Tehuantpc_RFD_hi
FodderHerb_Tehuantpc_RFD_lo
FodderHerb_TennR_IRR_hi
FodderHerb_TennR_IRR_lo
FodderHerb_TennR_RFD_hi
FodderHerb_TennR_RFD_lo
FodderHerb_TexasCst_IRR_hi
FodderHerb_TexasCst_IRR_lo
FodderHerb_TexasCst_RFD_hi
FodderHerb_TexasCst_RFD_lo
FodderHerb_ThaiGulf_RFD_hi
FodderHerb_ThaiGulf_RFD_lo
FodderHerb_TiberR_IRR_hi
FodderHerb_TiberR_IRR_lo
FodderHerb_TiberR_RFD_hi
FodderHerb_TiberR_RFD_lo
FodderHerb_TigrEuphR_IRR_hi
FodderHerb_TigrEuphR_IRR_lo
FodderHerb_TigrEuphR_RFD_hi
FodderHerb_TigrEuphR_RFD_lo
FodderHerb_UralR_IRR_hi
FodderHerb_UralR_IRR_lo
FodderHerb_UralR_RFD_hi
FodderHerb_UralR_RFD_lo
FodderHerb_UsaColoRN_IRR_hi
FodderHerb_UsaColoRN_IRR_lo
FodderHerb_UsaColoRN_RFD_hi
FodderHerb_UsaColoRN_RFD_lo
FodderHerb_UsaColoRS_IRR_hi
FodderHerb_UsaColoRS_IRR_lo
FodderHerb_UsaColoRS_RFD_hi
FodderHerb_UsaColoRS_RFD_lo
FodderHerb_UsaCstE_IRR_hi
FodderHerb_UsaCstE_IRR_lo
FodderHerb_UsaCstE_RFD_hi
FodderHerb_UsaCstE_RFD_lo
FodderHerb_UsaCstNE_IRR_hi
FodderHerb_UsaCstNE_IRR_lo
FodderHerb_UsaCstNE_RFD_hi
FodderHerb_UsaCstNE_RFD_lo
FodderHerb_UsaCstSE_IRR_hi
FodderHerb_UsaCstSE_IRR_lo
FodderHerb_UsaCstSE_RFD_hi
FodderHerb_UsaCstSE_RFD_lo
FodderHerb_UsaPacNW_IRR_hi
FodderHerb_UsaPacNW_IRR_lo
FodderHerb_UsaPacNW_RFD_hi
FodderHerb_UsaPacNW_RFD_lo
FodderHerb_VietnamCst_IRR_hi
FodderHerb_VietnamCst_IRR_lo
FodderHerb_VietnamCst_RFD_hi
FodderHerb_VietnamCst_RFD_lo
FodderHerb_VolgaR_IRR_hi
FodderHerb_VolgaR_IRR_lo
FodderHerb_VolgaR_RFD_hi
FodderHerb_VolgaR_RFD_lo
FodderHerb_WislaR_IRR_hi
FodderHerb_WislaR_IRR_lo
FodderHerb_WislaR_RFD_hi
FodderHerb_WislaR_RFD_lo
FodderHerb_XunJiang_IRR_hi
FodderHerb_XunJiang_IRR_lo
FodderHerb_XunJiang_RFD_hi
FodderHerb_XunJiang_RFD_lo
FodderHerb_YeniseiR_IRR_hi
FodderHerb_YeniseiR_IRR_lo
FodderHerb_YeniseiR_RFD_hi
FodderHerb_YeniseiR_RFD_lo
FodderHerb_YucatanP_IRR_hi
FodderHerb_YucatanP_IRR_lo
FodderHerb_YucatanP_RFD_hi
FodderHerb_YucatanP_RFD_lo
FodderHerbC4_AdrBlkSea_IRR_hi
FodderHerbC4_AdrBlkSea_IRR_lo
FodderHerbC4_AdrBlkSea_RFD_hi
FodderHerbC4_AdrBlkSea_RFD_lo
FodderHerbC4_AfrCstNE_RFD_hi
FodderHerbC4_AfrCstNE_RFD_lo
FodderHerbC4_AfrIntN_RFD_hi
FodderHerbC4_AfrIntN_RFD_lo
FodderHerbC4_AmazonR_RFD_hi
FodderHerbC4_AmazonR_RFD_lo
FodderHerbC4_AmuDaryaR_IRR_hi
FodderHerbC4_AmuDaryaR_IRR_lo
FodderHerbC4_AmurR_IRR_hi
FodderHerbC4_AmurR_IRR_lo
FodderHerbC4_AmurR_RFD_hi
FodderHerbC4_AmurR_RFD_lo
FodderHerbC4_ArabianP_IRR_hi

Soybean_RusCstSE
Soybean_SabarmatiR
Soybean_Salinas
Soybean_Salween
Soybean_SAmerCstN
Soybean_SAmerCstNE
Soybean_SaoFrancR
Soybean_SChinaSea
Soybean_SeineR
Soybean_SenegalR
Soybean_SepikR
Soybean_ShebJubR
Soybean_SiberiaW
Soybean_SinaiP
Soybean_SittaungR
Soybean_SpainCstSE
Soybean_SriLanka
Soybean_StLwrncR
Soybean_Sulawesi
Soybean_Sumatra
Soybean_SyrDaryaR
Soybean_TagusR
Soybean_Taiwan
Soybean_TaptiR
Soybean_Tarim
Soybean_Tehuantpc
Soybean_TennR
Soybean_TexasCst
Soybean_ThaiGulf
Soybean_TiberR
Soybean_TigrEuphR
Soybean_TocantinsR
Soybean_UralR
Soybean_UsaCstE
Soybean_UsaCstNE
Soybean_UsaCstSE
Soybean_VietnamCst
Soybean_VolgaR
Soybean_VoltaR
Soybean_WislaR
Soybean_XunJiang
Soybean_Yangtze
Soybean_YeniseiR
Soybean_YucatanP
Soybean_ZambeziR
Soybean_ZiyaHe
stationary
SugarCrop_AdrBlkSea
SugarCrop_AfrCstNW
SugarCrop_AfrCstW
SugarCrop_AfrIntN
SugarCrop_AmazonR
SugarCrop_AmuDaryaR
SugarCrop_AmurR
SugarCrop_ArabianSea
SugarCrop_ArgColoR
SugarCrop_ArgCstS
SugarCrop_BalticSea
SugarCrop_BengalBay
SugarCrop_BlackSeaN
SugarCrop_BlackSeaS
SugarCrop_BoHai
SugarCrop_BorneoCstN
SugarCrop_California
SugarCrop_CaspianE
SugarCrop_CaspianNE
SugarCrop_CaspianSW
SugarCrop_ChileCstN
SugarCrop_ChileCstS
SugarCrop_ChinaCst
SugarCrop_CntAmer
SugarCrop_ColEcuaCst
SugarCrop_DanubeR
SugarCrop_DaugavaR
SugarCrop_DeadSea
SugarCrop_DnieperR
SugarCrop_DniesterR
SugarCrop_DnkGrmCst
SugarCrop_DonR
SugarCrop_DouroR
SugarCrop_EbroR
SugarCrop_EJrdnSyr
SugarCrop_ElbeR
SugarCrop_EmsWeserR
SugarCrop_EngWales
SugarCrop_FarahrudR
SugarCrop_Finland
SugarCrop_FlyR
SugarCrop_FranceCstS
SugarCrop_FranceCstW
SugarCrop_GangesR
SugarCrop_Gironde
SugarCrop_Gobi
SugarCrop_GreatBasin
SugarCrop_GreatLakes
SugarCrop_GrijUsuR
FodderHerbC4_ArabianP_IRR_lo
FodderHerbC4_ArabianP_RFD_hi
FodderHerbC4_ArabianP_RFD_lo
FodderHerbC4_ArgColoR_IRR_hi
FodderHerbC4_ArgColoR_IRR_lo
FodderHerbC4_ArgColoR_RFD_hi
FodderHerbC4_ArgColoR_RFD_lo
FodderHerbC4_ArgCstN_IRR_hi
FodderHerbC4_ArgCstN_IRR_lo
FodderHerbC4_ArgCstN_RFD_hi
FodderHerbC4_ArgCstN_RFD_lo
FodderHerbC4_ArgCstS_IRR_hi
FodderHerbC4_ArgCstS_IRR_lo
FodderHerbC4_ArgCstS_RFD_hi
FodderHerbC4_ArgCstS_RFD_lo
FodderHerbC4_ArkWhtRedR_IRR_hi
FodderHerbC4_ArkWhtRedR_IRR_lo
FodderHerbC4_ArkWhtRedR_RFD_hi
FodderHerbC4_ArkWhtRedR_RFD_lo
FodderHerbC4_BalticSea_IRR_hi
FodderHerbC4_BalticSea_IRR_lo
FodderHerbC4_BalticSea_RFD_hi
FodderHerbC4_BalticSea_RFD_lo
FodderHerbC4_BarentsSea_IRR_hi
FodderHerbC4_BarentsSea_IRR_lo
FodderHerbC4_BarentsSea_RFD_hi
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FodderHerbC4_BlackSeaN_IRR_hi
FodderHerbC4_BlackSeaN_IRR_lo
FodderHerbC4_BlackSeaN_RFD_hi
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FodderHerbC4_BlackSeaS_IRR_hi
FodderHerbC4_BlackSeaS_IRR_lo
FodderHerbC4_BlackSeaS_RFD_hi
FodderHerbC4_BlackSeaS_RFD_lo
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FodderHerbC4_California_IRR_lo
FodderHerbC4_California_RFD_hi
FodderHerbC4_California_RFD_lo
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FodderHerbC4_ChileCstS_IRR_lo
FodderHerbC4_ChileCstS_RFD_hi
FodderHerbC4_ChileCstS_RFD_lo
FodderHerbC4_ColEcuaCst_RFD_hi
FodderHerbC4_ColEcuaCst_RFD_lo
FodderHerbC4_DanubeR_IRR_hi
FodderHerbC4_DanubeR_IRR_lo
FodderHerbC4_DanubeR_RFD_hi
FodderHerbC4_DanubeR_RFD_lo
FodderHerbC4_DaugavaR_IRR_hi
FodderHerbC4_DaugavaR_IRR_lo
FodderHerbC4_DaugavaR_RFD_hi
FodderHerbC4_DaugavaR_RFD_lo
FodderHerbC4_DeadSea_IRR_hi
FodderHerbC4_DeadSea_IRR_lo
FodderHerbC4_DnieperR_IRR_hi
FodderHerbC4_DnieperR_IRR_lo
FodderHerbC4_DnieperR_RFD_hi
FodderHerbC4_DnieperR_RFD_lo
FodderHerbC4_DniesterR_IRR_hi
FodderHerbC4_DniesterR_IRR_lo
FodderHerbC4_DniesterR_RFD_hi
FodderHerbC4_DniesterR_RFD_lo
FodderHerbC4_DnkGrmCst_IRR_hi
FodderHerbC4_DnkGrmCst_IRR_lo
FodderHerbC4_DnkGrmCst_RFD_hi
FodderHerbC4_DnkGrmCst_RFD_lo
FodderHerbC4_DonR_IRR_hi
FodderHerbC4_DonR_IRR_lo
FodderHerbC4_DonR_RFD_hi
FodderHerbC4_DonR_RFD_lo
FodderHerbC4_DouroR_IRR_hi
FodderHerbC4_DouroR_IRR_lo
FodderHerbC4_DouroR_RFD_hi
FodderHerbC4_DouroR_RFD_lo
FodderHerbC4_DvinaRN_IRR_hi

SugarCrop_GuadalqR
SugarCrop_GuadianaR
SugarCrop_HamuMashR
SugarCrop_Helmand
SugarCrop_Hong
SugarCrop_HuangHeR
SugarCrop_IberiaCst
SugarCrop_IdnE
SugarCrop_IndusR
SugarCrop_Iran
SugarCrop_Ireland
SugarCrop_IrianJaya
SugarCrop_IrrawaddyR
SugarCrop_ItalyCstE
SugarCrop_ItalyCstW
SugarCrop_Japan
SugarCrop_JavaTimor
SugarCrop_Kalimantan
SugarCrop_LaPuna
SugarCrop_LBalkash
SugarCrop_LoireR
SugarCrop_Mackenzie
SugarCrop_MagdalenaR
SugarCrop_MalaysiaP
SugarCrop_MeditE
SugarCrop_MeditIsl
SugarCrop_MeditS
SugarCrop_Mekong
SugarCrop_MexBaja
SugarCrop_MexCstNW
SugarCrop_MexCstW
SugarCrop_MexGulf
SugarCrop_MexInt
SugarCrop_MissouriR
SugarCrop_MisspRN
SugarCrop_NarvaR
SugarCrop_NegroR
SugarCrop_NelsonR
SugarCrop_NemanR
SugarCrop_NevaR
SugarCrop_NigerR
SugarCrop_NileR
SugarCrop_NWTerr
SugarCrop_ObR
SugarCrop_OderR
SugarCrop_OrinocoR
SugarCrop_Papaloapan
SugarCrop_PersianGulf
SugarCrop_PeruCst
SugarCrop_PolandCst
SugarCrop_PoR
SugarCrop_RhineR
SugarCrop_RhoneR
SugarCrop_RioBalsas
SugarCrop_RioGrande
SugarCrop_RioLerma
SugarCrop_RioVerde
SugarCrop_RusCstSE
SugarCrop_SabarmatiR
SugarCrop_Salween
SugarCrop_SAmerCstN
SugarCrop_SAmerCstNE
SugarCrop_ScheldtR
SugarCrop_SChinaSea
SugarCrop_Scotland
SugarCrop_SeineR
SugarCrop_SenegalR
SugarCrop_SepikR
SugarCrop_SinaiP
SugarCrop_SittaungR
SugarCrop_SpainCstSE
SugarCrop_Sulawesi
SugarCrop_Sumatra
SugarCrop_Sweden
SugarCrop_SyrDaryaR
SugarCrop_TagusR
SugarCrop_Taiwan
SugarCrop_Tarim
SugarCrop_Tehuantpc
SugarCrop_TiberR
SugarCrop_TigrEuphR
SugarCrop_UralR
SugarCrop_UsaColoRN
SugarCrop_UsaColoRS
SugarCrop_UsaPacNW
SugarCrop_VolgaR
SugarCrop_VoltaR
SugarCrop_WislaR
SugarCrop_XunJiang
SugarCrop_Yangtze
SugarCrop_YucatanP
SugarCrop_ZiyaHe
SugarCropC4_AfrCstE
SugarCropC4_AfrCstNE
SugarCropC4_AfrCstNW
SugarCropC4_AfrCstS
FodderHerbC4_DvinaRN_IRR_lo
FodderHerbC4_DvinaRN_RFD_hi
FodderHerbC4_DvinaRN_RFD_lo
FodderHerbC4_EbroR_IRR_hi
FodderHerbC4_EbroR_IRR_lo
FodderHerbC4_EbroR_RFD_hi
FodderHerbC4_EbroR_RFD_lo
FodderHerbC4_EJrdnSyr_IRR_hi
FodderHerbC4_EJrdnSyr_IRR_lo
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FodderHerbC4_EJrdnSyr_RFD_lo
FodderHerbC4_ElbeR_IRR_hi
FodderHerbC4_ElbeR_IRR_lo
FodderHerbC4_ElbeR_RFD_hi
FodderHerbC4_ElbeR_RFD_lo
FodderHerbC4_EmsWeserR_IRR_hi
FodderHerbC4_EmsWeserR_IRR_lo
FodderHerbC4_EmsWeserR_RFD_hi
FodderHerbC4_EmsWeserR_RFD_lo
FodderHerbC4_EngWales_RFD_hi
FodderHerbC4_EngWales_RFD_lo
FodderHerbC4_Finland_IRR_hi
FodderHerbC4_Finland_IRR_lo
FodderHerbC4_Finland_RFD_hi
FodderHerbC4_Finland_RFD_lo
FodderHerbC4_FranceCstS_IRR_hi
FodderHerbC4_FranceCstS_IRR_lo
FodderHerbC4_FranceCstS_RFD_hi
FodderHerbC4_FranceCstS_RFD_lo
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FodderHerbC4_Gironde_IRR_hi
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FodderHerbC4_Gironde_RFD_hi
FodderHerbC4_Gironde_RFD_lo
FodderHerbC4_Gobi_IRR_hi
FodderHerbC4_Gobi_IRR_lo
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FodderHerbC4_Gobi_RFD_lo
FodderHerbC4_GreatBasin_IRR_hi
FodderHerbC4_GreatBasin_IRR_lo
FodderHerbC4_GreatBasin_RFD_hi
FodderHerbC4_GreatBasin_RFD_lo
FodderHerbC4_GreatLakes_IRR_hi
FodderHerbC4_GreatLakes_IRR_lo
FodderHerbC4_GreatLakes_RFD_hi
FodderHerbC4_GreatLakes_RFD_lo
FodderHerbC4_GuadalqR_IRR_hi
FodderHerbC4_GuadalqR_IRR_lo
FodderHerbC4_GuadalqR_RFD_hi
FodderHerbC4_GuadalqR_RFD_lo
FodderHerbC4_GuadianaR_IRR_hi
FodderHerbC4_GuadianaR_IRR_lo
FodderHerbC4_GuadianaR_RFD_hi
FodderHerbC4_GuadianaR_RFD_lo
FodderHerbC4_HudsonBay_IRR_hi
FodderHerbC4_HudsonBay_IRR_lo
FodderHerbC4_HudsonBay_RFD_hi
FodderHerbC4_HudsonBay_RFD_lo
FodderHerbC4_IberiaCst_IRR_hi
FodderHerbC4_IberiaCst_IRR_lo
FodderHerbC4_IberiaCst_RFD_hi
FodderHerbC4_IberiaCst_RFD_lo
FodderHerbC4_Ireland_RFD_hi
FodderHerbC4_Ireland_RFD_lo
FodderHerbC4_ItalyCstE_IRR_hi
FodderHerbC4_ItalyCstE_IRR_lo
FodderHerbC4_ItalyCstE_RFD_hi
FodderHerbC4_ItalyCstE_RFD_lo
FodderHerbC4_ItalyCstW_IRR_hi
FodderHerbC4_ItalyCstW_IRR_lo
FodderHerbC4_ItalyCstW_RFD_hi
FodderHerbC4_ItalyCstW_RFD_lo
FodderHerbC4_Japan_IRR_hi
FodderHerbC4_Japan_IRR_lo
FodderHerbC4_Japan_RFD_hi
FodderHerbC4_Japan_RFD_lo
FodderHerbC4_LaPuna_RFD_hi
FodderHerbC4_LaPuna_RFD_lo
FodderHerbC4_LBalkash_IRR_hi
FodderHerbC4_LBalkash_IRR_lo
FodderHerbC4_LBalkash_RFD_hi
FodderHerbC4_LBalkash_RFD_lo
FodderHerbC4_LenaR_RFD_hi
FodderHerbC4_LenaR_RFD_lo
FodderHerbC4_LoireR_IRR_hi
FodderHerbC4_LoireR_IRR_lo
FodderHerbC4_LoireR_RFD_hi
FodderHerbC4_LoireR_RFD_lo
FodderHerbC4_Mackenzie_IRR_hi

SugarCropC4_AfrCstSE
SugarCropC4_AfrCstSSW
SugarCropC4_AfrCstW
SugarCropC4_AfrIntN
SugarCropC4_AfrIntS
SugarCropC4_AmazonR
SugarCropC4_AngolaCst
SugarCropC4_ArabianP
SugarCropC4_ArabianSea
SugarCropC4_AusCstE
SugarCropC4_AusCstN
SugarCropC4_BengalBay
SugarCropC4_BengalW
SugarCropC4_BorneoCstN
SugarCropC4_BrahmaniR
SugarCropC4_BrzCstE
SugarCropC4_BrzCstN
SugarCropC4_BrzCstS
SugarCropC4_Caribbean
SugarCropC4_CaspianE
SugarCropC4_CaspianSW
SugarCropC4_CauveryR
SugarCropC4_ChaoPhrR
SugarCropC4_ChinaCst
SugarCropC4_CntAmer
SugarCropC4_ColEcuaCst
SugarCropC4_CongoR
SugarCropC4_DeadSea
SugarCropC4_DouroR
SugarCropC4_EbroR
SugarCropC4_EJrdnSyr
SugarCropC4_FarahrudR
SugarCropC4_FlyR
SugarCropC4_FranceCstS
SugarCropC4_GangesR
SugarCropC4_GodavariR
SugarCropC4_GrijUsuR
SugarCropC4_GuadalqR
SugarCropC4_GuadianaR
SugarCropC4_GuineaGulf
SugarCropC4_Hainan
SugarCropC4_HamuMashR
SugarCropC4_Helmand
SugarCropC4_Hong
SugarCropC4_HuangHeR
SugarCropC4_IberiaCst
SugarCropC4_IdnE
SugarCropC4_IndCstE
SugarCropC4_IndCstNE
SugarCropC4_IndCstS
SugarCropC4_IndCstW
SugarCropC4_IndusR
SugarCropC4_Iran
SugarCropC4_IrianJaya
SugarCropC4_IrrawaddyR
SugarCropC4_Japan
SugarCropC4_JavaTimor
SugarCropC4_Kalimantan
SugarCropC4_KrishnaR
SugarCropC4_LaPuna
SugarCropC4_LChad
SugarCropC4_LimpopoR
SugarCropC4_Madagascar
SugarCropC4_MagdalenaR
SugarCropC4_MahanadiR
SugarCropC4_MahiR
SugarCropC4_MalaysiaP
SugarCropC4_MarChiq
SugarCropC4_MeditE
SugarCropC4_MeditIsl
SugarCropC4_MeditS
SugarCropC4_Mekong
SugarCropC4_MexBaja
SugarCropC4_MexCstNW
SugarCropC4_MexCstW
SugarCropC4_MexGulf
SugarCropC4_MexInt
SugarCropC4_MissppRS
SugarCropC4_MurrayDrlg
SugarCropC4_NarmadaR
SugarCropC4_NewCaledn
SugarCropC4_NigerR
SugarCropC4_NileR
SugarCropC4_OrangeR
SugarCropC4_OrinocoR
SugarCropC4_Papaloapan
SugarCropC4_PapuaCst
SugarCropC4_ParnaibaR
SugarCropC4_PennarR
SugarCropC4_PersianGulf
SugarCropC4_PeruCst
SugarCropC4_Phlppns
SugarCropC4_RiftValley
SugarCropC4_RioBalsas
SugarCropC4_RioGrande
SugarCropC4_RioLaPlata
FodderHerbC4_Mackenzie_IRR_lo
FodderHerbC4_Mackenzie_RFD_hi
FodderHerbC4_Mackenzie_RFD_lo
FodderHerbC4_MarChiq_IRR_hi
FodderHerbC4_MarChiq_IRR_lo
FodderHerbC4_MarChiq_RFD_hi
FodderHerbC4_MarChiq_RFD_lo
FodderHerbC4_MeditE_IRR_hi
FodderHerbC4_MeditE_IRR_lo
FodderHerbC4_MeditE_RFD_hi
FodderHerbC4_MeditE_RFD_lo
FodderHerbC4_MeditIsl_IRR_hi
FodderHerbC4_MeditIsl_IRR_lo
FodderHerbC4_MeditIsl_RFD_hi
FodderHerbC4_MeditIsl_RFD_lo
FodderHerbC4_MeditS_RFD_hi
FodderHerbC4_MeditS_RFD_lo
FodderHerbC4_MexBaja_IRR_hi
FodderHerbC4_MexBaja_IRR_lo
FodderHerbC4_MexBaja_RFD_hi
FodderHerbC4_MexBaja_RFD_lo
FodderHerbC4_MexCstNW_IRR_hi
FodderHerbC4_MexCstNW_IRR_lo
FodderHerbC4_MexCstNW_RFD_hi
FodderHerbC4_MexCstNW_RFD_lo
FodderHerbC4_MexCstW_IRR_hi
FodderHerbC4_MexCstW_IRR_lo
FodderHerbC4_MexCstW_RFD_hi
FodderHerbC4_MexCstW_RFD_lo
FodderHerbC4_MexGulf_IRR_hi
FodderHerbC4_MexGulf_IRR_lo
FodderHerbC4_MexGulf_RFD_hi
FodderHerbC4_MexGulf_RFD_lo
FodderHerbC4_MexInt_IRR_hi
FodderHerbC4_MexInt_IRR_lo
FodderHerbC4_MexInt_RFD_hi
FodderHerbC4_MexInt_RFD_lo
FodderHerbC4_MissouriR_IRR_hi
FodderHerbC4_MissouriR_IRR_lo
FodderHerbC4_MissouriR_RFD_hi
FodderHerbC4_MissouriR_RFD_lo
FodderHerbC4_MissppRN_IRR_hi
FodderHerbC4_MissppRN_IRR_lo
FodderHerbC4_MissppRN_RFD_hi
FodderHerbC4_MissppRN_RFD_lo
FodderHerbC4_MissppRS_IRR_hi
FodderHerbC4_MissppRS_IRR_lo
FodderHerbC4_MissppRS_RFD_hi
FodderHerbC4_MissppRS_RFD_lo
FodderHerbC4_NarvaR_IRR_hi
FodderHerbC4_NarvaR_IRR_lo
FodderHerbC4_NarvaR_RFD_hi
FodderHerbC4_NarvaR_RFD_lo
FodderHerbC4_NegroR_IRR_hi
FodderHerbC4_NegroR_IRR_lo
FodderHerbC4_NegroR_RFD_hi
FodderHerbC4_NegroR_RFD_lo
FodderHerbC4_NelsonR_IRR_hi
FodderHerbC4_NelsonR_IRR_lo
FodderHerbC4_NelsonR_RFD_hi
FodderHerbC4_NelsonR_RFD_lo
FodderHerbC4_NemanR_IRR_hi
FodderHerbC4_NemanR_IRR_lo
FodderHerbC4_NemanR_RFD_hi
FodderHerbC4_NemanR_RFD_lo
FodderHerbC4_NevaR_IRR_hi
FodderHerbC4_NevaR_IRR_lo
FodderHerbC4_NevaR_RFD_hi
FodderHerbC4_NevaR_RFD_lo
FodderHerbC4_NewZealand_IRR_hi
FodderHerbC4_NewZealand_IRR_lo
FodderHerbC4_NewZealand_RFD_hi
FodderHerbC4_NewZealand_RFD_lo
FodderHerbC4_NWTerr_IRR_hi
FodderHerbC4_NWTerr_IRR_lo
FodderHerbC4_NWTerr_RFD_hi
FodderHerbC4_NWTerr_RFD_lo
FodderHerbC4_ObR_IRR_hi
FodderHerbC4_ObR_IRR_lo
FodderHerbC4_ObR_RFD_hi
FodderHerbC4_ObR_RFD_lo
FodderHerbC4_OderR_IRR_hi
FodderHerbC4_OderR_IRR_lo
FodderHerbC4_OderR_RFD_hi
FodderHerbC4_OderR_RFD_lo
FodderHerbC4_OhioR_IRR_hi
FodderHerbC4_OhioR_IRR_lo
FodderHerbC4_OhioR_RFD_hi
FodderHerbC4_OhioR_RFD_lo
FodderHerbC4_PacArctic_IRR_hi
FodderHerbC4_PacArctic_IRR_lo
FodderHerbC4_PacArctic_RFD_hi
FodderHerbC4_PacArctic_RFD_lo
FodderHerbC4_Pampas_IRR_hi
FodderHerbC4_Pampas_IRR_lo
FodderHerbC4_Pampas_RFD_hi

SugarCropC4_RioLerma
SugarCropC4_RioVerde
SugarCropC4_SabarmatiR
SugarCropC4_Salinas
SugarCropC4_Salween
SugarCropC4_SAmerCstN
SugarCropC4_SAmerCstNE
SugarCropC4_SaoFrancR
SugarCropC4_SChinaSea
SugarCropC4_SenegalR
SugarCropC4_SepikR
SugarCropC4_ShebJubR
SugarCropC4_SinaiP
SugarCropC4_SittaungR
SugarCropC4_SpainCstSE
SugarCropC4_SriLanka
SugarCropC4_Sulawesi
SugarCropC4_Sumatra
SugarCropC4_TagusR
SugarCropC4_Taiwan
SugarCropC4_TaptiR
SugarCropC4_Tehuantpc
SugarCropC4_TexasCst
SugarCropC4_ThaiGulf
SugarCropC4_TigrEuphR
SugarCropC4_TocantinsR
SugarCropC4_UsaCstSE
SugarCropC4_VietnamCst
SugarCropC4_VoltaR
SugarCropC4_XunJiang
SugarCropC4_Yangtze
SugarCropC4_YucatanP
SugarCropC4_ZambeziR
SugarCropC4_ZiyaHe
traditional biomass
Vegetables_AdrBlkSea
Vegetables_AfrCstE
Vegetables_AfrCstNE
Vegetables_AfrCstNW
Vegetables_AfrCstS
Vegetables_AfrCstSE
Vegetables_AfrCstSSW
Vegetables_AfrCstSW
Vegetables_AfrCstW
Vegetables_AfrIntN
Vegetables_AfrIntS
Vegetables_AmazonR
Vegetables_AmuDaryaR
Vegetables_AmurR
Vegetables_AngolaCst
Vegetables_ArabianP
Vegetables_ArabianSea
Vegetables_ArgColoR
Vegetables_ArgCstN
Vegetables_ArgCstS
Vegetables_ArkWhtRedR
Vegetables_AusCstE
Vegetables_AusCstN
Vegetables_AusCstS
Vegetables_AusCstW
Vegetables_AusInt
Vegetables_BalticSea
Vegetables_BarentsSea
Vegetables_BengalBay
Vegetables_BengalW
Vegetables_BlackSeaN
Vegetables_BlackSeaS
Vegetables_BoHai
Vegetables_BorneoCstN
Vegetables_BrahmaniR
Vegetables_BrzCstE
Vegetables_BrzCstN
Vegetables_BrzCstS
Vegetables_California
Vegetables_CanAtl
Vegetables_Caribbean
Vegetables_CaspianE
Vegetables_CaspianNE
Vegetables_CaspianSW
Vegetables_CauveryR
Vegetables_ChaoPhrR
Vegetables_ChileCstN
Vegetables_ChileCstS
Vegetables_ChinaCst
Vegetables_CntAmer
Vegetables_ColEcuaCst
Vegetables_CongoR
Vegetables_DanubeR
Vegetables_DaugavaR
Vegetables_DeadSea
Vegetables_DnieperR
Vegetables_DniesterR
Vegetables_DnkGrmCst
Vegetables_DonR
Vegetables_DouroR
Vegetables_DvinaRN
FodderHerbC4_Pampas_RFD_lo
FodderHerbC4_Papaloapan_IRR_hi
FodderHerbC4_Papaloapan_IRR_lo
FodderHerbC4_Papaloapan_RFD_hi
FodderHerbC4_Papaloapan_RFD_lo
FodderHerbC4_PeruCst_RFD_hi
FodderHerbC4_PeruCst_RFD_lo
FodderHerbC4_PolandCst_IRR_hi
FodderHerbC4_PolandCst_IRR_lo
FodderHerbC4_PolandCst_RFD_hi
FodderHerbC4_PolandCst_RFD_lo
FodderHerbC4_PoR_IRR_hi
FodderHerbC4_PoR_IRR_lo
FodderHerbC4_PoR_RFD_hi
FodderHerbC4_PoR_RFD_lo
FodderHerbC4_RedSeaE_IRR_hi
FodderHerbC4_RedSeaE_IRR_lo
FodderHerbC4_RedSeaE_RFD_hi
FodderHerbC4_RedSeaE_RFD_lo
FodderHerbC4_RhineR_IRR_hi
FodderHerbC4_RhineR_IRR_lo
FodderHerbC4_RhineR_RFD_hi
FodderHerbC4_RhineR_RFD_lo
FodderHerbC4_RhoneR_IRR_hi
FodderHerbC4_RhoneR_IRR_lo
FodderHerbC4_RhoneR_RFD_hi
FodderHerbC4_RhoneR_RFD_lo
FodderHerbC4_RioBalsas_IRR_hi
FodderHerbC4_RioBalsas_IRR_lo
FodderHerbC4_RioBalsas_RFD_hi
FodderHerbC4_RioBalsas_RFD_lo
FodderHerbC4_RioGrande_IRR_hi
FodderHerbC4_RioGrande_IRR_lo
FodderHerbC4_RioGrande_RFD_hi
FodderHerbC4_RioGrande_RFD_lo
FodderHerbC4_RioLaPlata_IRR_hi
FodderHerbC4_RioLaPlata_IRR_lo
FodderHerbC4_RioLaPlata_RFD_hi
FodderHerbC4_RioLaPlata_RFD_lo
FodderHerbC4_RioLerma_IRR_hi
FodderHerbC4_RioLerma_IRR_lo
FodderHerbC4_RioLerma_RFD_hi
FodderHerbC4_RioLerma_RFD_lo
FodderHerbC4_RioVerde_IRR_hi
FodderHerbC4_RioVerde_IRR_lo
FodderHerbC4_RioVerde_RFD_hi
FodderHerbC4_RioVerde_RFD_lo
FodderHerbC4_RusCstSE_IRR_hi
FodderHerbC4_RusCstSE_IRR_lo
FodderHerbC4_RusCstSE_RFD_hi
FodderHerbC4_RusCstSE_RFD_lo
FodderHerbC4_Salinas_IRR_hi
FodderHerbC4_Salinas_IRR_lo
FodderHerbC4_Salinas_RFD_hi
FodderHerbC4_Salinas_RFD_lo
FodderHerbC4_ScheldtR_IRR_hi
FodderHerbC4_ScheldtR_IRR_lo
FodderHerbC4_ScheldtR_RFD_hi
FodderHerbC4_ScheldtR_RFD_lo
FodderHerbC4_Scotland_RFD_hi
FodderHerbC4_Scotland_RFD_lo
FodderHerbC4_SeineR_IRR_hi
FodderHerbC4_SeineR_IRR_lo
FodderHerbC4_SeineR_RFD_hi
FodderHerbC4_SeineR_RFD_lo
FodderHerbC4_SiberiaW_RFD_hi
FodderHerbC4_SiberiaW_RFD_lo
FodderHerbC4_SpainCstSE_IRR_hi
FodderHerbC4_SpainCstSE_IRR_lo
FodderHerbC4_SpainCstSE_RFD_hi
FodderHerbC4_SpainCstSE_RFD_lo
FodderHerbC4_StLwrncR_IRR_hi
FodderHerbC4_StLwrncR_IRR_lo
FodderHerbC4_StLwrncR_RFD_hi
FodderHerbC4_StLwrncR_RFD_lo
FodderHerbC4_Sweden_IRR_hi
FodderHerbC4_Sweden_IRR_lo
FodderHerbC4_Sweden_RFD_hi
FodderHerbC4_Sweden_RFD_lo
FodderHerbC4_SyrDaryaR_IRR_hi
FodderHerbC4_SyrDaryaR_IRR_lo
FodderHerbC4_SyrDaryaR_RFD_hi
FodderHerbC4_SyrDaryaR_RFD_lo
FodderHerbC4_TagusR_IRR_hi
FodderHerbC4_TagusR_IRR_lo
FodderHerbC4_TagusR_RFD_hi
FodderHerbC4_TagusR_RFD_lo
FodderHerbC4_Taiwan_IRR_hi
FodderHerbC4_Taiwan_IRR_lo
FodderHerbC4_Taiwan_RFD_hi
FodderHerbC4_Taiwan_RFD_lo
FodderHerbC4_Tarim_RFD_hi
FodderHerbC4_Tarim_RFD_lo
FodderHerbC4_Tehuantpc_IRR_hi
FodderHerbC4_Tehuantpc_IRR_lo
FodderHerbC4_Tehuantpc_RFD_hi

Vegetables_EbroR
Vegetables_EJrdnSyr
Vegetables_ElbeR
Vegetables_EmsWeserR
Vegetables_EngWales
Vegetables_FarahrudR
Vegetables_Finland
Vegetables_FlyR
Vegetables_FranceCstS
Vegetables_FranceCstW
Vegetables_FraserR
Vegetables_GangesR
Vegetables_Gironde
Vegetables_Gobi
Vegetables_GodavariR
Vegetables_GreatBasin
Vegetables_GreatLakes
Vegetables_GrijUsuR
Vegetables_GuadalqR
Vegetables_GuadianaR
Vegetables_GuineaGulf
Vegetables_Hainan
Vegetables_HamuMashR
Vegetables_Helmand
Vegetables_Hong
Vegetables_HuangHeR
Vegetables_HudsonBay
Vegetables_IberiaCst
Vegetables_Iceland
Vegetables_IdnE
Vegetables_IndCstE
Vegetables_IndCstNE
Vegetables_IndCstS
Vegetables_IndCstW
Vegetables_IndusR
Vegetables_Iran
Vegetables_Ireland
Vegetables_IrianJaya
Vegetables_IrrawaddyR
Vegetables_ItalyCstE
Vegetables_ItalyCstW
Vegetables_Japan
Vegetables_JavaTimor
Vegetables_Kalimantan
Vegetables_Korea
Vegetables_KrishnaR
Vegetables_LaPuna
Vegetables_LBalkash
Vegetables_LChad
Vegetables_LenaR
Vegetables_LimpopoR
Vegetables_LoireR
Vegetables_Mackenzie
Vegetables_Madagascar
Vegetables_MagdalenaR
Vegetables_MahanadiR
Vegetables_MahiR
Vegetables_MalaysiaP
Vegetables_MarChiq
Vegetables_MeditE
Vegetables_MeditIsl
Vegetables_MeditS
Vegetables_Mekong
Vegetables_MexBaja
Vegetables_MexCstNW
Vegetables_MexCstW
Vegetables_MexGulf
Vegetables_MexInt
Vegetables_MissouriR
Vegetables_MissppRN
Vegetables_MissppRS
Vegetables_MurrayDrlg
Vegetables_NarmadaR
Vegetables_NarvaR
Vegetables_NegroR
Vegetables_NelsonR
Vegetables_NemanR
Vegetables_NevaR
Vegetables_NewCaledn
Vegetables_NewZealand
Vegetables_NigerR
Vegetables_NileR
Vegetables_NWTerr
Vegetables_ObR
Vegetables_OderR
Vegetables_OhioR
Vegetables_OrangeR
Vegetables_OrinocoR
Vegetables_PacArctic
Vegetables_Pampas
Vegetables_Papaloapan
Vegetables_PapuaCst
Vegetables_ParnaibaR
Vegetables_Patagonia
Vegetables_PennarR
Vegetables_PersianGulf
FodderHerbC4_Tehuantpc_RFD_lo
FodderHerbC4_TennR_IRR_hi
FodderHerbC4_TennR_IRR_lo
FodderHerbC4_TennR_RFD_hi
FodderHerbC4_TennR_RFD_lo
FodderHerbC4_TexasCst_IRR_hi
FodderHerbC4_TexasCst_IRR_lo
FodderHerbC4_TexasCst_RFD_hi
FodderHerbC4_TexasCst_RFD_lo
FodderHerbC4_TiberR_IRR_hi
FodderHerbC4_TiberR_IRR_lo
FodderHerbC4_TiberR_RFD_hi
FodderHerbC4_TiberR_RFD_lo
FodderHerbC4_TigrEuphR_IRR_hi
FodderHerbC4_TigrEuphR_IRR_lo
FodderHerbC4_TigrEuphR_RFD_hi
FodderHerbC4_TigrEuphR_RFD_lo
FodderHerbC4_UralR_IRR_hi
FodderHerbC4_UralR_IRR_lo
FodderHerbC4_UralR_RFD_hi
FodderHerbC4_UralR_RFD_lo
FodderHerbC4_UsaColoRN_IRR_hi
FodderHerbC4_UsaColoRN_IRR_lo
FodderHerbC4_UsaColoRN_RFD_hi
FodderHerbC4_UsaColoRN_RFD_lo
FodderHerbC4_UsaColoRS_IRR_hi
FodderHerbC4_UsaColoRS_IRR_lo
FodderHerbC4_UsaColoRS_RFD_hi
FodderHerbC4_UsaColoRS_RFD_lo
FodderHerbC4_UsaCstE_IRR_hi
FodderHerbC4_UsaCstE_IRR_lo
FodderHerbC4_UsaCstE_RFD_hi
FodderHerbC4_UsaCstE_RFD_lo
FodderHerbC4_UsaCstNE_IRR_hi
FodderHerbC4_UsaCstNE_IRR_lo
FodderHerbC4_UsaCstNE_RFD_hi
FodderHerbC4_UsaCstNE_RFD_lo
FodderHerbC4_UsaCstSE_IRR_hi
FodderHerbC4_UsaCstSE_IRR_lo
FodderHerbC4_UsaCstSE_RFD_hi
FodderHerbC4_UsaCstSE_RFD_lo
FodderHerbC4_UsaPacNW_IRR_hi
FodderHerbC4_UsaPacNW_IRR_lo
FodderHerbC4_UsaPacNW_RFD_hi
FodderHerbC4_UsaPacNW_RFD_lo
FodderHerbC4_VolgaR_IRR_hi
FodderHerbC4_VolgaR_IRR_lo
FodderHerbC4_VolgaR_RFD_hi
FodderHerbC4_VolgaR_RFD_lo
FodderHerbC4_WislaR_IRR_hi
FodderHerbC4_WislaR_IRR_lo
FodderHerbC4_WislaR_RFD_hi
FodderHerbC4_WislaR_RFD_lo
FodderHerbC4_YeniseiR_IRR_hi
FodderHerbC4_YeniseiR_IRR_lo
FodderHerbC4_YeniseiR_RFD_hi
FodderHerbC4_YeniseiR_RFD_lo
ForestFire_AdrBlkSea
ForestFire_AfrCstW
ForestFire_AmazonR
ForestFire_AmuDaryaR
ForestFire_AmurR
ForestFire_ArgColoR
ForestFire_ArgCstS
ForestFire_ArkWhtRedR
ForestFire_AusCstE
ForestFire_AusCstN
ForestFire_AusCstS
ForestFire_AusCstW
ForestFire_BalticSea
ForestFire_BarentsSea
ForestFire_BengalBay
ForestFire_BlackSeaN
ForestFire_BlackSeaS
ForestFire_BoHai
ForestFire_BorneoCstN
ForestFire_BrzCstE
ForestFire_BrzCstN
ForestFire_BrzCstS
ForestFire_California
ForestFire_CanAtl
ForestFire_Caribbean
ForestFire_CaspianNE
ForestFire_CaspianSW
ForestFire_ChaoPhrR
ForestFire_ChileCstN
ForestFire_ChileCstS
ForestFire_ChinaCst
ForestFire_ChurchillR
ForestFire_CntAmer
ForestFire_ColEcuaCst
ForestFire_CongoR
ForestFire_DanubeR
ForestFire_DaugavaR
ForestFire_DnieperR
ForestFire_DniesterR

Vegetables_PeruCst
Vegetables_Phlppns
Vegetables_PolandCst
Vegetables_PoR
Vegetables_RedSeaE
Vegetables_RhineR
Vegetables_RhoneR
Vegetables_RiftValley
Vegetables_RioBalsas
Vegetables_RioGrande
Vegetables_RioLaPlata
Vegetables_RioLerma
Vegetables_RioVerde
Vegetables_RusCstSE
Vegetables_SabarmatiR
Vegetables_Salinas
Vegetables_Salween
Vegetables_SAmerCstN
Vegetables_SAmerCstNE
Vegetables_SaoFrancR
Vegetables_ScheldtR
Vegetables_SChinaSea
Vegetables_ScndnvN
Vegetables_Scotland
Vegetables_SeineR
Vegetables_SenegalR
Vegetables_SepikR
Vegetables_ShebJubR
Vegetables_SiberiaW
Vegetables_SinaiP
Vegetables_SittaungR
Vegetables_SolomonIsl
Vegetables_SpainCstSE
Vegetables_SriLanka
Vegetables_StLwrncR
Vegetables_Sulawesi
Vegetables_Sumatra
Vegetables_Sweden
Vegetables_SyrDaryaR
Vegetables_TagusR
Vegetables_Taiwan
Vegetables_TaptiR
Vegetables_Tarim
Vegetables_Tasmania
Vegetables_Tehuantpc
Vegetables_TennR
Vegetables_TexasCst
Vegetables_ThaiGulf
Vegetables_TiberR
Vegetables_TigrEuphR
Vegetables_TocantinsR
Vegetables_UralR
Vegetables_UsaColoRN
Vegetables_UsaColoRS
Vegetables_UsaCstE
Vegetables_UsaCstNE
Vegetables_UsaCstSE
Vegetables_UsaPacNW
Vegetables_VietnamCst
Vegetables_VolgaR
Vegetables_VoltaR
Vegetables_WislaR
Vegetables_XunJiang
Vegetables_Yangtze
Vegetables_YeniseiR
Vegetables_YucatanP
Vegetables_ZambeziR
Vegetables_ZiyaHe
waste_incineration
wastewater
Wheat_AdrBlkSea
Wheat_AfrCstE
Wheat_AfrCstNE
Wheat_AfrCstNW
Wheat_AfrCstS
Wheat_AfrCstSE
Wheat_AfrCstSSW
Wheat_AfrCstSW
Wheat_AfrCstW
Wheat_AfrIntN
Wheat_AfrIntS
Wheat_AmazonR
Wheat_AmuDaryaR
Wheat_AmurR
Wheat_AngolaCst
Wheat_ArabianP
Wheat_ArabianSea
Wheat_ArgColoR
Wheat_ArgCstN
Wheat_ArgCstS
Wheat_ArkWhtRedR
Wheat_AusCstE
Wheat_AusCstN
Wheat_AusCstS
Wheat_AusCstW
Wheat_AusInt
ForestFire_DnkGrmCst
ForestFire_DonR
ForestFire_DvinaRN
ForestFire_ElbeR
ForestFire_Finland
ForestFire_FlyR
ForestFire_FraserR
ForestFire_GangesR
ForestFire_Gobi
ForestFire_GreatBasin
ForestFire_GreatLakes
ForestFire_GrijUsuR
ForestFire_GuineaGulf
ForestFire_Hong
ForestFire_HudsonBay
ForestFire_Iceland
ForestFire_IdnE
ForestFire_IrianJaya
ForestFire_IrrawaddyR
ForestFire_Japan
ForestFire_JavaTimor
ForestFire_Kalimantan
ForestFire_KaraSea
ForestFire_Korea
ForestFire_LaPuna
ForestFire_LBalkash
ForestFire_LChad
ForestFire_LenaR
ForestFire_Mackenzie
ForestFire_MalaysiaP
ForestFire_MarChiq
ForestFire_MeditE
ForestFire_Mekong
ForestFire_MexBaja
ForestFire_MexCstNW
ForestFire_MexCstW
ForestFire_MexGulf
ForestFire_MexInt
ForestFire_MissouriR
ForestFire_MissppRN
ForestFire_MissppRS
ForestFire_MurrayDrlg
ForestFire_NarvaR
ForestFire_NegroR
ForestFire_NelsonR
ForestFire_NemanR
ForestFire_NevaR
ForestFire_NewCaledn
ForestFire_NewZealand
ForestFire_NigerR
ForestFire_NileR
ForestFire_NWTerr
ForestFire_ObR
ForestFire_OderR
ForestFire_OhioR
ForestFire_OrinocoR
ForestFire_PacArctic
ForestFire_Pampas
ForestFire_Papaloapan
ForestFire_PapuaCst
ForestFire_ParnaibaR
ForestFire_Patagonia
ForestFire_PeruCst
ForestFire_Phlppns
ForestFire_PolandCst
ForestFire_PoR
ForestFire_RhineR
ForestFire_RhoneR
ForestFire_RioBalsas
ForestFire_RioGrande
ForestFire_RioLaPlata
ForestFire_RioLerma
ForestFire_RioVerde
ForestFire_RusCstSE
ForestFire_Salinas
ForestFire_Salween
ForestFire_SAmerCstN
ForestFire_SAmerCstNE
ForestFire_SaoFrancR
ForestFire_SChinaSea
ForestFire_ScndnvN
ForestFire_SenegalR
ForestFire_SepikR
ForestFire_SiberiaN
ForestFire_SiberiaW
ForestFire_SittaungR
ForestFire_SolomonIsl
ForestFire_SriLanka
ForestFire_StLwrncR
ForestFire_Sweden
ForestFire_SyrDaryaR
ForestFire_Taiwan
ForestFire_Tasmania
ForestFire_Tehuantpc
ForestFire_TennR
ForestFire_TexasCst

Wheat_BalticSea
Wheat_BarentsSea
Wheat_BengalBay
Wheat_BengalW
Wheat_BlackSeaN
Wheat_BlackSeaS
Wheat_BoHai
Wheat_BrahmaniR
Wheat_BrzCstS
Wheat_California
Wheat_CanAtl
Wheat_CaspianE
Wheat_CaspianNE
Wheat_CaspianSW
Wheat_CauveryR
Wheat_ChaoPhrR
Wheat_ChileCstN
Wheat_ChileCstS
Wheat_ChinaCst
Wheat_CntAmer
Wheat_ColEcuaCst
Wheat_CongoR
Wheat_DanubeR
Wheat_DaugavaR
Wheat_DeadSea
Wheat_DnieperR
Wheat_DniesterR
Wheat_DnkGrmCst
Wheat_DonR
Wheat_DouroR
Wheat_DvinaRN
Wheat_EbroR
Wheat_EJrdnSyr
Wheat_ElbeR
Wheat_EmsWeserR
Wheat_EngWales
Wheat_FarahrudR
Wheat_Finland
Wheat_FranceCstS
Wheat_FranceCstW
Wheat_FraserR
Wheat_GangesR
Wheat_Gironde
Wheat_Gobi
Wheat_GodavariR
Wheat_GreatBasin
Wheat_GreatLakes
Wheat_GrijUsuR
Wheat_GuadalqR
Wheat_GuadianaR
Wheat_GuineaGulf
Wheat_HamuMashR
Wheat_Helmand
Wheat_Hong
Wheat_HuangHeR
Wheat_HudsonBay
Wheat_IberiaCst
Wheat_IndCstE
Wheat_IndCstNE
Wheat_IndCstS
Wheat_IndCstW
Wheat_IndusR
Wheat_Iran
Wheat_Ireland
Wheat_IrrawaddyR
Wheat_ItalyCstE
Wheat_ItalyCstW
Wheat_Japan
Wheat_Korea
Wheat_KrishnaR
Wheat_LaPuna
Wheat_LBalkash
Wheat_LChad
Wheat_LenaR
Wheat_LimpopoR
Wheat_LoireR
Wheat_Mackenzie
Wheat_Madagascar
Wheat_MagdalenaR
Wheat_MahanadiR
Wheat_MahiR
Wheat_MalaysiaP
Wheat_MarChiq
Wheat_MeditE
Wheat_MeditIsl
Wheat_MeditS
Wheat_Mekong
Wheat_MexBaja
Wheat_MexCstNW
Wheat_MexCstW
Wheat_MexGulf
Wheat_MexInt
Wheat_MissouriR
Wheat_MissppRN
Wheat_MissppRS
Wheat_MurrayDrlg
ForestFire_ThaiGulf
ForestFire_TigrEuphR
ForestFire_TocantinsR
ForestFire_UralR
ForestFire_UsaColoRN
ForestFire_UsaColoRS
ForestFire_UsaCstE
ForestFire_UsaCstNE
ForestFire_UsaCstSE
ForestFire_UsaPacNW
ForestFire_VietnamCst
ForestFire_VolgaR
ForestFire_VoltaR
ForestFire_WislaR
ForestFire_XunJiang
ForestFire_YeniseiR
ForestFire_YucatanP
ForestFire_ZambeziR
Fruits_AdrBlkSea_IRR_hi
Fruits_AdrBlkSea_IRR_lo
Fruits_AdrBlkSea_RFD_hi
Fruits_AdrBlkSea_RFD_lo
Fruits_AfrCstE_IRR_hi
Fruits_AfrCstE_IRR_lo
Fruits_AfrCstE_RFD_hi
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Fruits_AfrCstSSW_IRR_lo
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Fruits_AfrCstSW_IRR_hi
Fruits_AfrCstSW_IRR_lo
Fruits_AfrCstSW_RFD_hi
Fruits_AfrCstSW_RFD_lo
Fruits_AfrCstW_IRR_hi
Fruits_AfrCstW_IRR_lo
Fruits_AfrCstW_RFD_hi
Fruits_AfrCstW_RFD_lo
Fruits_AfrIntN_IRR_hi
Fruits_AfrIntN_IRR_lo
Fruits_AfrIntN_RFD_hi
Fruits_AfrIntN_RFD_lo
Fruits_AfrIntS_IRR_hi
Fruits_AfrIntS_IRR_lo
Fruits_AfrIntS_RFD_hi
Fruits_AfrIntS_RFD_lo
Fruits_AmazonR_IRR_hi
Fruits_AmazonR_IRR_lo
Fruits_AmazonR_RFD_hi
Fruits_AmazonR_RFD_lo
Fruits_AmuDaryaR_IRR_hi
Fruits_AmuDaryaR_IRR_lo
Fruits_AmuDaryaR_RFD_hi
Fruits_AmuDaryaR_RFD_lo
Fruits_AmurR_IRR_hi
Fruits_AmurR_IRR_lo
Fruits_AmurR_RFD_hi
Fruits_AmurR_RFD_lo
Fruits_AngolaCst_IRR_hi
Fruits_AngolaCst_IRR_lo
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Fruits_AngolaCst_RFD_lo
Fruits_ArabianP_IRR_hi
Fruits_ArabianP_IRR_lo
Fruits_ArabianP_RFD_hi
Fruits_ArabianP_RFD_lo
Fruits_ArabianSea_IRR_hi
Fruits_ArabianSea_IRR_lo
Fruits_ArabianSea_RFD_hi
Fruits_ArabianSea_RFD_lo
Fruits_ArgColoR_IRR_hi
Fruits_ArgColoR_IRR_lo
Fruits_ArgColoR_RFD_hi
Fruits_ArgColoR_RFD_lo
Fruits_ArgCstN_IRR_hi
Fruits_ArgCstN_IRR_lo
Fruits_ArgCstN_RFD_hi
Fruits_ArgCstN_RFD_lo
Fruits_ArgCstS_IRR_hi
Fruits_ArgCstS_IRR_lo

Wheat_NarmadaR
Wheat_NarvaR
Wheat_NegroR
Wheat_NelsonR
Wheat_NemanR
Wheat_NevaR
Wheat_NewCaledn
Wheat_NewZealand
Wheat_NigerR
Wheat_NileR
Wheat_NWTerr
Wheat_ObR
Wheat_OderR
Wheat_OhioR
Wheat_OrangeR
Wheat_OrinocoR
Wheat_Pampas
Wheat_Papaloapan
Wheat_PennarR
Wheat_PersianGulf
Wheat_PeruCst
Wheat_PolandCst
Wheat_PoR
Wheat_RedSeaE
Wheat_RhineR
Wheat_RhoneR
Wheat_RiftValley
Wheat_RioBalsas
Wheat_RioGrande
Wheat_RioLaPlata
Wheat_RioLerma
Wheat_RioVerde
Wheat_RusCstSE
Wheat_SabarmatiR
Wheat_Salinas
Wheat_Salween
Wheat_SAmerCstN
Wheat_SAmerCstNE
Wheat_SaoFrancR
Wheat_ScheldtR
Wheat_SChinaSea
Wheat_ScndnvN
Wheat_Scotland
Wheat_SeineR
Wheat_SenegalR
Wheat_ShebJubR
Wheat_SinaiP
Wheat_SittaungR
Wheat_SpainCstSE
Wheat_StLwrncR
Wheat_Sweden
Wheat_SyrDaryaR
Wheat_TagusR
Wheat_Taiwan
Wheat_TaptiR
Wheat_Tarim
Wheat_Tasmania
Wheat_Tehuantpc
Wheat_TennR
Wheat_TexasCst
Wheat_ThaiGulf
Wheat_TiberR
Wheat_TigrEuphR
Wheat_TocantinsR
Wheat_UralR
Wheat_UsaColoRN
Wheat_UsaColoRS
Wheat_UsaCstE
Wheat_UsaCstNE
Wheat_UsaCstSE
Wheat_UsaPacNW
Wheat_VolgaR
Wheat_WislaR
Wheat_XunJiang
Wheat_Yangtze
Wheat_YeniseiR
Wheat_YucatanP
Wheat_ZambeziR
Wheat_ZiyaHe

Fruits_ArgCstS_RFD_hi
Fruits_ArgCstS_RFD_lo
Fruits_ArkWhtRedR_IRR_hi
Fruits_ArkWhtRedR_IRR_lo
Fruits_ArkWhtRedR_RFD_hi
Fruits_ArkWhtRedR_RFD_lo
Fruits_AusCstE_IRR_hi
Fruits_AusCstE_IRR_lo
Fruits_AusCstE_RFD_hi
Fruits_AusCstE_RFD_lo
Fruits_AusCstN_IRR_hi
Fruits_AusCstN_IRR_lo
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Fruits_AusCstN_RFD_lo
Fruits_AusCstS_IRR_hi
Fruits_AusCstS_IRR_lo
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Fruits_BalticSea_RFD_lo
Fruits_BarentsSea_IRR_hi
Fruits_BarentsSea_IRR_lo
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Fruits_BengalW_RFD_hi
Fruits_BengalW_RFD_lo
Fruits_BlackSeaN_IRR_hi
Fruits_BlackSeaN_IRR_lo
Fruits_BlackSeaN_RFD_hi
Fruits_BlackSeaN_RFD_lo
Fruits_BlackSeaS_IRR_hi
Fruits_BlackSeaS_IRR_lo
Fruits_BlackSeaS_RFD_hi
Fruits_BlackSeaS_RFD_lo
Fruits_BoHai_IRR_hi
Fruits_BoHai_IRR_lo
Fruits_BoHai_RFD_hi
Fruits_BoHai_RFD_lo
Fruits_BorneoCstN_IRR_hi
Fruits_BorneoCstN_IRR_lo
Fruits_BorneoCstN_RFD_hi
Fruits_BorneoCstN_RFD_lo
Fruits_BrahmaniR_IRR_hi
Fruits_BrahmaniR_IRR_lo
Fruits_BrahmaniR_RFD_hi
Fruits_BrahmaniR_RFD_lo
Fruits_BrzCstE_IRR_hi
Fruits_BrzCstE_IRR_lo
Fruits_BrzCstE_RFD_hi
Fruits_BrzCstE_RFD_lo
Fruits_BrzCstN_IRR_hi
Fruits_BrzCstN_IRR_lo
Fruits_BrzCstN_RFD_hi
Fruits_BrzCstN_RFD_lo
Fruits_BrzCstS_IRR_hi
Fruits_BrzCstS_IRR_lo
Fruits_BrzCstS_RFD_hi
Fruits_BrzCstS_RFD_lo
Fruits_California_IRR_hi
Fruits_California_IRR_lo
Fruits_California_RFD_hi
Fruits_California_RFD_lo
Fruits_CanAtl_IRR_hi
Fruits_CanAtl_IRR_lo
Fruits_CanAtl_RFD_hi
Fruits_CanAtl_RFD_lo
Fruits_Caribbean_IRR_hi
Fruits_Caribbean_IRR_lo
Fruits_Caribbean_RFD_hi
Fruits_Caribbean_RFD_lo
Fruits_CaspianE_IRR_hi
Fruits_CaspianE_IRR_lo
Fruits_CaspianE_RFD_hi
Fruits_CaspianE_RFD_lo
Fruits_CaspianNE_IRR_hi
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Fruits_CaspianNE_RFD_lo
Fruits_CaspianSW_IRR_hi
Fruits_CaspianSW_IRR_lo

Fruits_CaspianSW_RFD_hi
Fruits_CaspianSW_RFD_lo
Fruits_CauveryR_IRR_hi
Fruits_CauveryR_IRR_lo
Fruits_CauveryR_RFD_hi
Fruits_CauveryR_RFD_lo
Fruits_ChaoPhrR_IRR_hi
Fruits_ChaoPhrR_IRR_lo
Fruits_ChaoPhrR_RFD_hi
Fruits_ChaoPhrR_RFD_lo
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Fruits_ColEcuaCst_RFD_hi
Fruits_ColEcuaCst_RFD_lo
Fruits_CongoR_IRR_hi
Fruits_CongoR_IRR_lo
Fruits_CongoR_RFD_hi
Fruits_CongoR_RFD_lo
Fruits_DanubeR_IRR_hi
Fruits_DanubeR_IRR_lo
Fruits_DanubeR_RFD_hi
Fruits_DanubeR_RFD_lo
Fruits_DaugavaR_IRR_hi
Fruits_DaugavaR_IRR_lo
Fruits_DaugavaR_RFD_hi
Fruits_DaugavaR_RFD_lo
Fruits_DeadSea_IRR_hi
Fruits_DeadSea_IRR_lo
Fruits_DeadSea_RFD_hi
Fruits_DeadSea_RFD_lo
Fruits_DnieperR_IRR_hi
Fruits_DnieperR_IRR_lo
Fruits_DnieperR_RFD_hi
Fruits_DnieperR_RFD_lo
Fruits_DniesterR_IRR_hi
Fruits_DniesterR_IRR_lo
Fruits_DniesterR_RFD_hi
Fruits_DniesterR_RFD_lo
Fruits_DnkGrmCst_IRR_hi
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Fruits_DnkGrmCst_RFD_hi
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Fruits_DonR_IRR_hi
Fruits_DonR_IRR_lo
Fruits_DonR_RFD_hi
Fruits_DonR_RFD_lo
Fruits_DouroR_IRR_hi
Fruits_DouroR_IRR_lo
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Fruits_DvinaRN_IRR_lo
Fruits_DvinaRN_RFD_hi
Fruits_DvinaRN_RFD_lo
Fruits_EbroR_IRR_hi
Fruits_EbroR_IRR_lo
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Fruits_EbroR_RFD_lo
Fruits_EJrdnSyr_IRR_hi
Fruits_EJrdnSyr_IRR_lo
Fruits_EJrdnSyr_RFD_hi
Fruits_EJrdnSyr_RFD_lo
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Fruits_ElbeR_IRR_lo
Fruits_ElbeR_RFD_hi
Fruits_ElbeR_RFD_lo
Fruits_EmsWeserR_IRR_hi
Fruits_EmsWeserR_IRR_lo
Fruits_EmsWeserR_RFD_hi
Fruits_EmsWeserR_RFD_lo
Fruits_EngWales_IRR_hi
Fruits_EngWales_IRR_lo
Fruits_EngWales_RFD_hi
Fruits_EngWales_RFD_lo
Fruits_FarahrudR_IRR_hi
Fruits_FarahrudR_IRR_lo
Fruits_FarahrudR_RFD_hi
Fruits_FarahrudR_RFD_lo
Fruits_Finland_IRR_hi
Fruits_Finland_IRR_lo

Fruits_Finland_RFD_hi
Fruits_Finland_RFD_lo
Fruits_FlyR_RFD_hi
Fruits_FlyR_RFD_lo
Fruits_FranceCstS_IRR_hi
Fruits_FranceCstS_IRR_lo
Fruits_FranceCstS_RFD_hi
Fruits_FranceCstS_RFD_lo
Fruits_FranceCstW_IRR_hi
Fruits_FranceCstW_IRR_lo
Fruits_FranceCstW_RFD_hi
Fruits_FranceCstW_RFD_lo
Fruits_FraserR_IRR_hi
Fruits_FraserR_IRR_lo
Fruits_FraserR_RFD_hi
Fruits_FraserR_RFD_lo
Fruits_GangesR_IRR_hi
Fruits_GangesR_IRR_lo
Fruits_GangesR_RFD_hi
Fruits_GangesR_RFD_lo
Fruits_Gironde_IRR_hi
Fruits_Gironde_IRR_lo
Fruits_Gironde_RFD_hi
Fruits_Gironde_RFD_lo
Fruits_Gobi_IRR_hi
Fruits_Gobi_IRR_lo
Fruits_Gobi_RFD_hi
Fruits_Gobi_RFD_lo
Fruits_GodavariR_IRR_hi
Fruits_GodavariR_IRR_lo
Fruits_GodavariR_RFD_hi
Fruits_GodavariR_RFD_lo
Fruits_GreatBasin_IRR_hi
Fruits_GreatBasin_IRR_lo
Fruits_GreatBasin_RFD_hi
Fruits_GreatBasin_RFD_lo
Fruits_GreatLakes_IRR_hi
Fruits_GreatLakes_IRR_lo
Fruits_GreatLakes_RFD_hi
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Fruits_GrijUsuR_RFD_lo
Fruits_GuadalqR_IRR_hi
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Fruits_GuadianaR_IRR_hi
Fruits_GuadianaR_IRR_lo
Fruits_GuadianaR_RFD_hi
Fruits_GuadianaR_RFD_lo
Fruits_GuineaGulf_IRR_hi
Fruits_GuineaGulf_IRR_lo
Fruits_GuineaGulf_RFD_hi
Fruits_GuineaGulf_RFD_lo
Fruits_Hainan_IRR_hi
Fruits_Hainan_IRR_lo
Fruits_Hainan_RFD_hi
Fruits_Hainan_RFD_lo
Fruits_HamuMashR_IRR_hi
Fruits_HamuMashR_IRR_lo
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Fruits_HamuMashR_RFD_lo
Fruits_Helmand_IRR_hi
Fruits_Helmand_IRR_lo
Fruits_Helmand_RFD_hi
Fruits_Helmand_RFD_lo
Fruits_Hong_IRR_hi
Fruits_Hong_IRR_lo
Fruits_Hong_RFD_hi
Fruits_Hong_RFD_lo
Fruits_HuangHeR_IRR_hi
Fruits_HuangHeR_IRR_lo
Fruits_HuangHeR_RFD_hi
Fruits_HuangHeR_RFD_lo
Fruits_HudsonBay_IRR_hi
Fruits_HudsonBay_IRR_lo
Fruits_IberiaCst_IRR_hi
Fruits_IberiaCst_IRR_lo
Fruits_IberiaCst_RFD_hi
Fruits_IberiaCst_RFD_lo
Fruits_IdnE_RFD_hi
Fruits_IdnE_RFD_lo
Fruits_IndCstE_IRR_hi
Fruits_IndCstE_IRR_lo
Fruits_IndCstE_RFD_hi
Fruits_IndCstE_RFD_lo
Fruits_IndCstNE_IRR_hi
Fruits_IndCstNE_IRR_lo
Fruits_IndCstNE_RFD_hi
Fruits_IndCstNE_RFD_lo
Fruits_IndCstS_IRR_hi
Fruits_IndCstS_IRR_lo
Fruits_IndCstS_RFD_hi
Fruits_IndCstS_RFD_lo

Fruits_IndCstW_IRR_hi
Fruits_IndCstW_IRR_lo
Fruits_IndCstW_RFD_hi
Fruits_IndCstW_RFD_lo
Fruits_IndusR_IRR_hi
Fruits_IndusR_IRR_lo
Fruits_IndusR_RFD_hi
Fruits_IndusR_RFD_lo
Fruits_Iran_IRR_hi
Fruits_Iran_IRR_lo
Fruits_Iran_RFD_hi
Fruits_Iran_RFD_lo
Fruits_Ireland_IRR_hi
Fruits_Ireland_IRR_lo
Fruits_Ireland_RFD_hi
Fruits_Ireland_RFD_lo
Fruits_IrianJaya_RFD_hi
Fruits_IrianJaya_RFD_lo
Fruits_IrrawaddyR_IRR_hi
Fruits_IrrawaddyR_IRR_lo
Fruits_IrrawaddyR_RFD_hi
Fruits_IrrawaddyR_RFD_lo
Fruits_ItalyCstE_IRR_hi
Fruits_ItalyCstE_IRR_lo
Fruits_ItalyCstE_RFD_hi
Fruits_ItalyCstE_RFD_lo
Fruits_ItalyCstW_IRR_hi
Fruits_ItalyCstW_IRR_lo
Fruits_ItalyCstW_RFD_hi
Fruits_ItalyCstW_RFD_lo
Fruits_Japan_IRR_hi
Fruits_Japan_IRR_lo
Fruits_Japan_RFD_hi
Fruits_Japan_RFD_lo
Fruits_JavaTimor_RFD_hi
Fruits_JavaTimor_RFD_lo
Fruits_Kalimantan_RFD_hi
Fruits_Kalimantan_RFD_lo
Fruits_Korea_IRR_hi
Fruits_Korea_IRR_lo
Fruits_Korea_RFD_hi
Fruits_Korea_RFD_lo
Fruits_KrishnaR_IRR_hi
Fruits_KrishnaR_IRR_lo
Fruits_KrishnaR_RFD_hi
Fruits_KrishnaR_RFD_lo
Fruits_LaPuna_IRR_hi
Fruits_LaPuna_IRR_lo
Fruits_LaPuna_RFD_hi
Fruits_LaPuna_RFD_lo
Fruits_LBalkash_IRR_hi
Fruits_LBalkash_IRR_lo
Fruits_LBalkash_RFD_hi
Fruits_LBalkash_RFD_lo
Fruits_LChad_IRR_hi
Fruits_LChad_IRR_lo
Fruits_LChad_RFD_hi
Fruits_LChad_RFD_lo
Fruits_LenaR_IRR_hi
Fruits_LenaR_IRR_lo
Fruits_LenaR_RFD_hi
Fruits_LenaR_RFD_lo
Fruits_LimpopoR_IRR_hi
Fruits_LimpopoR_IRR_lo
Fruits_LimpopoR_RFD_hi
Fruits_LimpopoR_RFD_lo
Fruits_LoireR_IRR_hi
Fruits_LoireR_IRR_lo
Fruits_LoireR_RFD_hi
Fruits_LoireR_RFD_lo
Fruits_Mackenzie_IRR_hi
Fruits_Mackenzie_IRR_lo
Fruits_Mackenzie_RFD_hi
Fruits_Mackenzie_RFD_lo
Fruits_Madagascar_RFD_hi
Fruits_Madagascar_RFD_lo
Fruits_MagdalenaR_IRR_hi
Fruits_MagdalenaR_IRR_lo
Fruits_MagdalenaR_RFD_hi
Fruits_MagdalenaR_RFD_lo
Fruits_MahanadiR_IRR_hi
Fruits_MahanadiR_IRR_lo
Fruits_MahanadiR_RFD_hi
Fruits_MahanadiR_RFD_lo
Fruits_MahiR_IRR_hi
Fruits_MahiR_IRR_lo
Fruits_MahiR_RFD_hi
Fruits_MahiR_RFD_lo
Fruits_MalaysiaP_IRR_hi
Fruits_MalaysiaP_IRR_lo
Fruits_MalaysiaP_RFD_hi
Fruits_MalaysiaP_RFD_lo
Fruits_MarChiq_IRR_hi
Fruits_MarChiq_IRR_lo
Fruits_MarChiq_RFD_hi
Fruits_MarChiq_RFD_lo

Fruits_MeditE_IRR_hi
Fruits_MeditE_IRR_lo
Fruits_MeditE_RFD_hi
Fruits_MeditE_RFD_lo
Fruits_MeditIsl_IRR_hi
Fruits_MeditIsl_IRR_lo
Fruits_MeditIsl_RFD_hi
Fruits_MeditIsl_RFD_lo
Fruits_MeditS_IRR_hi
Fruits_MeditS_IRR_lo
Fruits_MeditS_RFD_hi
Fruits_MeditS_RFD_lo
Fruits_Mekong_IRR_hi
Fruits_Mekong_IRR_lo
Fruits_Mekong_RFD_hi
Fruits_Mekong_RFD_lo
Fruits_MexBaja_IRR_hi
Fruits_MexBaja_IRR_lo
Fruits_MexBaja_RFD_hi
Fruits_MexBaja_RFD_lo
Fruits_MexCstNW_IRR_hi
Fruits_MexCstNW_IRR_lo
Fruits_MexCstNW_RFD_hi
Fruits_MexCstNW_RFD_lo
Fruits_MexCstW_IRR_hi
Fruits_MexCstW_IRR_lo
Fruits_MexCstW_RFD_hi
Fruits_MexCstW_RFD_lo
Fruits_MexGulf_IRR_hi
Fruits_MexGulf_IRR_lo
Fruits_MexGulf_RFD_hi
Fruits_MexGulf_RFD_lo
Fruits_MexInt_IRR_hi
Fruits_MexInt_IRR_lo
Fruits_MexInt_RFD_hi
Fruits_MexInt_RFD_lo
Fruits_MissouriR_IRR_hi
Fruits_MissouriR_IRR_lo
Fruits_MissouriR_RFD_hi
Fruits_MissouriR_RFD_lo
Fruits_MissppRN_IRR_hi
Fruits_MissppRN_IRR_lo
Fruits_MissppRN_RFD_hi
Fruits_MissppRN_RFD_lo
Fruits_MissppRS_IRR_hi
Fruits_MissppRS_IRR_lo
Fruits_MissppRS_RFD_hi
Fruits_MissppRS_RFD_lo
Fruits_MurrayDrlg_IRR_hi
Fruits_MurrayDrlg_IRR_lo
Fruits_MurrayDrlg_RFD_hi
Fruits_MurrayDrlg_RFD_lo
Fruits_NarmadaR_IRR_hi
Fruits_NarmadaR_IRR_lo
Fruits_NarmadaR_RFD_hi
Fruits_NarmadaR_RFD_lo
Fruits_NarvaR_IRR_hi
Fruits_NarvaR_IRR_lo
Fruits_NarvaR_RFD_hi
Fruits_NarvaR_RFD_lo
Fruits_NegroR_IRR_hi
Fruits_NegroR_IRR_lo
Fruits_NegroR_RFD_hi
Fruits_NegroR_RFD_lo
Fruits_NelsonR_IRR_hi
Fruits_NelsonR_IRR_lo
Fruits_NelsonR_RFD_hi
Fruits_NelsonR_RFD_lo
Fruits_NemanR_IRR_hi
Fruits_NemanR_IRR_lo
Fruits_NemanR_RFD_hi
Fruits_NemanR_RFD_lo
Fruits_NevaR_IRR_hi
Fruits_NevaR_IRR_lo
Fruits_NevaR_RFD_hi
Fruits_NevaR_RFD_lo
Fruits_NewCaledn_RFD_hi
Fruits_NewCaledn_RFD_lo
Fruits_NewZealand_IRR_hi
Fruits_NewZealand_IRR_lo
Fruits_NewZealand_RFD_hi
Fruits_NewZealand_RFD_lo
Fruits_NigerR_IRR_hi
Fruits_NigerR_IRR_lo
Fruits_NigerR_RFD_hi
Fruits_NigerR_RFD_lo
Fruits_NileR_IRR_hi
Fruits_NileR_IRR_lo
Fruits_NileR_RFD_hi
Fruits_NileR_RFD_lo
Fruits_NWTerr_IRR_hi
Fruits_NWTerr_IRR_lo
Fruits_NWTerr_RFD_hi
Fruits_NWTerr_RFD_lo
Fruits_ObR_IRR_hi
Fruits_ObR_IRR_lo

Fruits_ObR_RFD_hi
Fruits_ObR_RFD_lo
Fruits_OderR_IRR_hi
Fruits_OderR_IRR_lo
Fruits_OderR_RFD_hi
Fruits_OderR_RFD_lo
Fruits_OhioR_IRR_hi
Fruits_OhioR_IRR_lo
Fruits_OhioR_RFD_hi
Fruits_OhioR_RFD_lo
Fruits_OrangeR_IRR_hi
Fruits_OrangeR_IRR_lo
Fruits_OrangeR_RFD_hi
Fruits_OrangeR_RFD_lo
Fruits_OrinocoR_IRR_hi
Fruits_OrinocoR_IRR_lo
Fruits_OrinocoR_RFD_hi
Fruits_OrinocoR_RFD_lo
Fruits_PacArctic_IRR_hi
Fruits_PacArctic_IRR_lo
Fruits_PacArctic_RFD_hi
Fruits_PacArctic_RFD_lo
Fruits_Pampas_IRR_hi
Fruits_Pampas_IRR_lo
Fruits_Pampas_RFD_hi
Fruits_Pampas_RFD_lo
Fruits_Papaloapan_IRR_hi
Fruits_Papaloapan_IRR_lo
Fruits_Papaloapan_RFD_hi
Fruits_Papaloapan_RFD_lo
Fruits_PapuaCst_RFD_hi
Fruits_PapuaCst_RFD_lo
Fruits_ParnaibaR_IRR_hi
Fruits_ParnaibaR_IRR_lo
Fruits_ParnaibaR_RFD_hi
Fruits_ParnaibaR_RFD_lo
Fruits_Patagonia_IRR_hi
Fruits_Patagonia_IRR_lo
Fruits_Patagonia_RFD_hi
Fruits_Patagonia_RFD_lo
Fruits_PennarR_IRR_hi
Fruits_PennarR_IRR_lo
Fruits_PennarR_RFD_hi
Fruits_PennarR_RFD_lo
Fruits_PersianGulf_IRR_hi
Fruits_PersianGulf_IRR_lo
Fruits_PersianGulf_RFD_hi
Fruits_PersianGulf_RFD_lo
Fruits_PeruCst_IRR_hi
Fruits_PeruCst_IRR_lo
Fruits_PeruCst_RFD_hi
Fruits_PeruCst_RFD_lo
Fruits_Phlppns_IRR_hi
Fruits_Phlppns_IRR_lo
Fruits_Phlppns_RFD_hi
Fruits_Phlppns_RFD_lo
Fruits_PolandCst_IRR_hi
Fruits_PolandCst_IRR_lo
Fruits_PolandCst_RFD_hi
Fruits_PolandCst_RFD_lo
Fruits_PoR_IRR_hi
Fruits_PoR_IRR_lo
Fruits_PoR_RFD_hi
Fruits_PoR_RFD_lo
Fruits_RedSeaE_IRR_hi
Fruits_RedSeaE_IRR_lo
Fruits_RedSeaE_RFD_hi
Fruits_RedSeaE_RFD_lo
Fruits_RhineR_IRR_hi
Fruits_RhineR_IRR_lo
Fruits_RhineR_RFD_hi
Fruits_RhineR_RFD_lo
Fruits_RhoneR_IRR_hi
Fruits_RhoneR_IRR_lo
Fruits_RhoneR_RFD_hi
Fruits_RhoneR_RFD_lo
Fruits_RiftValley_IRR_hi
Fruits_RiftValley_IRR_lo
Fruits_RiftValley_RFD_hi
Fruits_RiftValley_RFD_lo
Fruits_RioBalsas_IRR_hi
Fruits_RioBalsas_IRR_lo
Fruits_RioBalsas_RFD_hi
Fruits_RioBalsas_RFD_lo
Fruits_RioGrande_IRR_hi
Fruits_RioGrande_IRR_lo
Fruits_RioGrande_RFD_hi
Fruits_RioGrande_RFD_lo
Fruits_RioLaPlata_IRR_hi
Fruits_RioLaPlata_IRR_lo
Fruits_RioLaPlata_RFD_hi
Fruits_RioLaPlata_RFD_lo
Fruits_RioLerma_IRR_hi
Fruits_RioLerma_IRR_lo
Fruits_RioLerma_RFD_hi
Fruits_RioLerma_RFD_lo

Fruits_RioVerde_IRR_hi
Fruits_RioVerde_IRR_lo
Fruits_RioVerde_RFD_hi
Fruits_RioVerde_RFD_lo
Fruits_RusCstSE_IRR_hi
Fruits_RusCstSE_IRR_lo
Fruits_RusCstSE_RFD_hi
Fruits_RusCstSE_RFD_lo
Fruits_SabarmatiR_IRR_hi
Fruits_SabarmatiR_IRR_lo
Fruits_SabarmatiR_RFD_hi
Fruits_SabarmatiR_RFD_lo
Fruits_Salinas_IRR_hi
Fruits_Salinas_IRR_lo
Fruits_Salinas_RFD_hi
Fruits_Salinas_RFD_lo
Fruits_Salween_IRR_hi
Fruits_Salween_IRR_lo
Fruits_Salween_RFD_hi
Fruits_Salween_RFD_lo
Fruits_SAmerCstN_IRR_hi
Fruits_SAmerCstN_IRR_lo
Fruits_SAmerCstN_RFD_hi
Fruits_SAmerCstN_RFD_lo
Fruits_SAmerCstNE_IRR_hi
Fruits_SAmerCstNE_IRR_lo
Fruits_SAmerCstNE_RFD_hi
Fruits_SAmerCstNE_RFD_lo
Fruits_SaoFrancR_IRR_hi
Fruits_SaoFrancR_IRR_lo
Fruits_SaoFrancR_RFD_hi
Fruits_SaoFrancR_RFD_lo
Fruits_ScheldtR_IRR_hi
Fruits_ScheldtR_IRR_lo
Fruits_ScheldtR_RFD_hi
Fruits_ScheldtR_RFD_lo
Fruits_SChinaSea_IRR_hi
Fruits_SChinaSea_IRR_lo
Fruits_SChinaSea_RFD_hi
Fruits_SChinaSea_RFD_lo
Fruits_ScndnvN_IRR_hi
Fruits_ScndnvN_IRR_lo
Fruits_Scotland_IRR_hi
Fruits_Scotland_IRR_lo
Fruits_Scotland_RFD_hi
Fruits_Scotland_RFD_lo
Fruits_SeineR_IRR_hi
Fruits_SeineR_IRR_lo
Fruits_SeineR_RFD_hi
Fruits_SeineR_RFD_lo
Fruits_SenegalR_IRR_hi
Fruits_SenegalR_IRR_lo
Fruits_SenegalR_RFD_hi
Fruits_SenegalR_RFD_lo
Fruits_SepikR_RFD_hi
Fruits_SepikR_RFD_lo
Fruits_ShebJubR_IRR_hi
Fruits_ShebJubR_IRR_lo
Fruits_ShebJubR_RFD_hi
Fruits_ShebJubR_RFD_lo
Fruits_SiberiaW_IRR_hi
Fruits_SiberiaW_IRR_lo
Fruits_SiberiaW_RFD_hi
Fruits_SiberiaW_RFD_lo
Fruits_SinaiP_IRR_hi
Fruits_SinaiP_IRR_lo
Fruits_SinaiP_RFD_hi
Fruits_SinaiP_RFD_lo
Fruits_SolomonIsl_RFD_hi
Fruits_SolomonIsl_RFD_lo
Fruits_SpainCstSE_IRR_hi
Fruits_SpainCstSE_IRR_lo
Fruits_SpainCstSE_RFD_hi
Fruits_SpainCstSE_RFD_lo
Fruits_SriLanka_RFD_hi
Fruits_SriLanka_RFD_lo
Fruits_StLwrncR_IRR_hi
Fruits_StLwrncR_IRR_lo
Fruits_Sulawesi_RFD_hi
Fruits_Sulawesi_RFD_lo
Fruits_Sumatra_RFD_hi
Fruits_Sumatra_RFD_lo
Fruits_Sweden_IRR_hi
Fruits_Sweden_IRR_lo
Fruits_Sweden_RFD_hi
Fruits_Sweden_RFD_lo
Fruits_SyrDaryaR_IRR_hi
Fruits_SyrDaryaR_IRR_lo
Fruits_SyrDaryaR_RFD_hi
Fruits_SyrDaryaR_RFD_lo
Fruits_TagusR_IRR_hi
Fruits_TagusR_IRR_lo
Fruits_TagusR_RFD_hi
Fruits_TagusR_RFD_lo
Fruits_Taiwan_IRR_hi
Fruits_Taiwan_IRR_lo

Fruits_Taiwan_RFD_hi
Fruits_Taiwan_RFD_lo
Fruits_TaptiR_IRR_hi
Fruits_TaptiR_IRR_lo
Fruits_TaptiR_RFD_hi
Fruits_TaptiR_RFD_lo
Fruits_Tarim_IRR_hi
Fruits_Tarim_IRR_lo
Fruits_Tarim_RFD_hi
Fruits_Tarim_RFD_lo
Fruits_Tasmania_IRR_hi
Fruits_Tasmania_IRR_lo
Fruits_Tasmania_RFD_hi
Fruits_Tasmania_RFD_lo
Fruits_Tehuantpc_IRR_hi
Fruits_Tehuantpc_IRR_lo
Fruits_Tehuantpc_RFD_hi
Fruits_Tehuantpc_RFD_lo
Fruits_TennR_IRR_hi
Fruits_TennR_IRR_lo
Fruits_TennR_RFD_hi
Fruits_TennR_RFD_lo
Fruits_TexasCst_IRR_hi
Fruits_TexasCst_IRR_lo
Fruits_TexasCst_RFD_hi
Fruits_TexasCst_RFD_lo
Fruits_ThaiGulf_IRR_hi
Fruits_ThaiGulf_IRR_lo
Fruits_ThaiGulf_RFD_hi
Fruits_ThaiGulf_RFD_lo
Fruits_TiberR_IRR_hi
Fruits_TiberR_IRR_lo
Fruits_TiberR_RFD_hi
Fruits_TiberR_RFD_lo
Fruits_TigrEuphR_IRR_hi
Fruits_TigrEuphR_IRR_lo
Fruits_TigrEuphR_RFD_hi
Fruits_TigrEuphR_RFD_lo
Fruits_TocantinsR_IRR_hi
Fruits_TocantinsR_IRR_lo
Fruits_TocantinsR_RFD_hi
Fruits_TocantinsR_RFD_lo
Fruits_UralR_IRR_hi
Fruits_UralR_IRR_lo
Fruits_UralR_RFD_hi
Fruits_UralR_RFD_lo
Fruits_UsaColoRN_IRR_hi
Fruits_UsaColoRN_IRR_lo
Fruits_UsaColoRN_RFD_hi
Fruits_UsaColoRN_RFD_lo
Fruits_UsaColoRS_IRR_hi
Fruits_UsaColoRS_IRR_lo
Fruits_UsaColoRS_RFD_hi
Fruits_UsaColoRS_RFD_lo
Fruits_UsaCstE_IRR_hi
Fruits_UsaCstE_IRR_lo
Fruits_UsaCstE_RFD_hi
Fruits_UsaCstE_RFD_lo
Fruits_UsaCstNE_IRR_hi
Fruits_UsaCstNE_IRR_lo
Fruits_UsaCstNE_RFD_hi
Fruits_UsaCstNE_RFD_lo
Fruits_UsaCstSE_IRR_hi
Fruits_UsaCstSE_IRR_lo
Fruits_UsaCstSE_RFD_hi
Fruits_UsaCstSE_RFD_lo
Fruits_UsaPacNW_IRR_hi
Fruits_UsaPacNW_IRR_lo
Fruits_UsaPacNW_RFD_hi
Fruits_UsaPacNW_RFD_lo
Fruits_VietnamCst_IRR_hi
Fruits_VietnamCst_IRR_lo
Fruits_VietnamCst_RFD_hi
Fruits_VietnamCst_RFD_lo
Fruits_VolgaR_IRR_hi
Fruits_VolgaR_IRR_lo
Fruits_VolgaR_RFD_hi
Fruits_VolgaR_RFD_lo
Fruits_VoltaR_IRR_hi
Fruits_VoltaR_IRR_lo
Fruits_VoltaR_RFD_hi
Fruits_VoltaR_RFD_lo
Fruits_WislaR_IRR_hi
Fruits_WislaR_IRR_lo
Fruits_WislaR_RFD_hi
Fruits_WislaR_RFD_lo
Fruits_XunJiang_IRR_hi
Fruits_XunJiang_IRR_lo
Fruits_XunJiang_RFD_hi
Fruits_XunJiang_RFD_lo
Fruits_Yangtze_IRR_hi
Fruits_Yangtze_IRR_lo
Fruits_Yangtze_RFD_hi
Fruits_Yangtze_RFD_lo
Fruits_YeniseiR_IRR_hi
Fruits_YeniseiR_IRR_lo

Fruits_YeniseiR_RFD_hi
Fruits_YeniseiR_RFD_lo
Fruits_YucatanP_IRR_hi
Fruits_YucatanP_IRR_lo
Fruits_YucatanP_RFD_hi
Fruits_YucatanP_RFD_lo
Fruits_ZambeziR_IRR_hi
Fruits_ZambeziR_IRR_lo
Fruits_ZambeziR_RFD_hi
Fruits_ZambeziR_RFD_lo
Fruits_ZiyaHe_IRR_hi
Fruits_ZiyaHe_IRR_lo
Fruits_ZiyaHe_RFD_hi
Fruits_ZiyaHe_RFD_lo
FruitsTree_AdrBlkSea_IRR_hi
FruitsTree_AdrBlkSea_IRR_lo
FruitsTree_AdrBlkSea_RFD_hi
FruitsTree_AdrBlkSea_RFD_lo
FruitsTree_AfrCstE_IRR_hi
FruitsTree_AfrCstE_IRR_lo
FruitsTree_AfrCstE_RFD_hi
FruitsTree_AfrCstE_RFD_lo
FruitsTree_AfrCstNE_IRR_hi
FruitsTree_AfrCstNE_IRR_lo
FruitsTree_AfrCstNE_RFD_hi
FruitsTree_AfrCstNE_RFD_lo
FruitsTree_AfrCstNW_IRR_hi
FruitsTree_AfrCstNW_IRR_lo
FruitsTree_AfrCstNW_RFD_hi
FruitsTree_AfrCstNW_RFD_lo
FruitsTree_AfrCstS_IRR_hi
FruitsTree_AfrCstS_IRR_lo
FruitsTree_AfrCstS_RFD_hi
FruitsTree_AfrCstS_RFD_lo
FruitsTree_AfrCstSE_IRR_hi
FruitsTree_AfrCstSE_IRR_lo
FruitsTree_AfrCstSE_RFD_hi
FruitsTree_AfrCstSE_RFD_lo
FruitsTree_AfrCstSSW_IRR_hi
FruitsTree_AfrCstSSW_IRR_lo
FruitsTree_AfrCstSSW_RFD_hi
FruitsTree_AfrCstSSW_RFD_lo
FruitsTree_AfrCstSW_IRR_hi
FruitsTree_AfrCstSW_IRR_lo
FruitsTree_AfrCstSW_RFD_hi
FruitsTree_AfrCstSW_RFD_lo
FruitsTree_AfrCstW_IRR_hi
FruitsTree_AfrCstW_IRR_lo
FruitsTree_AfrCstW_RFD_hi
FruitsTree_AfrCstW_RFD_lo
FruitsTree_AfrIntN_IRR_hi
FruitsTree_AfrIntN_IRR_lo
FruitsTree_AfrIntN_RFD_hi
FruitsTree_AfrIntN_RFD_lo
FruitsTree_AfrIntS_IRR_hi
FruitsTree_AfrIntS_IRR_lo
FruitsTree_AfrIntS_RFD_hi
FruitsTree_AfrIntS_RFD_lo
FruitsTree_AmazonR_IRR_hi
FruitsTree_AmazonR_IRR_lo
FruitsTree_AmazonR_RFD_hi
FruitsTree_AmazonR_RFD_lo
FruitsTree_AmuDaryaR_IRR_hi
FruitsTree_AmuDaryaR_IRR_lo
FruitsTree_AmuDaryaR_RFD_hi
FruitsTree_AmuDaryaR_RFD_lo
FruitsTree_AmurR_IRR_hi
FruitsTree_AmurR_IRR_lo
FruitsTree_AmurR_RFD_hi
FruitsTree_AmurR_RFD_lo
FruitsTree_AngolaCst_IRR_hi
FruitsTree_AngolaCst_IRR_lo
FruitsTree_AngolaCst_RFD_hi
FruitsTree_AngolaCst_RFD_lo
FruitsTree_ArabianP_IRR_hi
FruitsTree_ArabianP_IRR_lo
FruitsTree_ArabianP_RFD_hi
FruitsTree_ArabianP_RFD_lo
FruitsTree_ArabianSea_IRR_hi
FruitsTree_ArabianSea_IRR_lo
FruitsTree_ArabianSea_RFD_hi
FruitsTree_ArabianSea_RFD_lo
FruitsTree_ArgColoR_IRR_hi
FruitsTree_ArgColoR_IRR_lo
FruitsTree_ArgColoR_RFD_hi
FruitsTree_ArgColoR_RFD_lo
FruitsTree_ArgCstN_IRR_hi
FruitsTree_ArgCstN_IRR_lo
FruitsTree_ArgCstN_RFD_hi
FruitsTree_ArgCstN_RFD_lo
FruitsTree_ArgCstS_IRR_hi
FruitsTree_ArgCstS_IRR_lo
FruitsTree_ArgCstS_RFD_hi
FruitsTree_ArgCstS_RFD_lo
FruitsTree_ArkWhtRedR_IRR_hi
FruitsTree_ArkWhtRedR_IRR_lo

FruitsTree_ArkWhtRedR_RFD_hi
FruitsTree_ArkWhtRedR_RFD_lo
FruitsTree_AusCstE_IRR_hi
FruitsTree_AusCstE_IRR_lo
FruitsTree_AusCstE_RFD_hi
FruitsTree_AusCstE_RFD_lo
FruitsTree_AusCstN_IRR_hi
FruitsTree_AusCstN_IRR_lo
FruitsTree_AusCstN_RFD_hi
FruitsTree_AusCstN_RFD_lo
FruitsTree_AusCstS_IRR_hi
FruitsTree_AusCstS_IRR_lo
FruitsTree_AusCstS_RFD_hi
FruitsTree_AusCstS_RFD_lo
FruitsTree_AusCstW_IRR_hi
FruitsTree_AusCstW_IRR_lo
FruitsTree_AusCstW_RFD_hi
FruitsTree_AusCstW_RFD_lo
FruitsTree_AusInt_IRR_hi
FruitsTree_AusInt_IRR_lo
FruitsTree_AusInt_RFD_hi
FruitsTree_AusInt_RFD_lo
FruitsTree_BalticSea_IRR_hi
FruitsTree_BalticSea_IRR_lo
FruitsTree_BalticSea_RFD_hi
FruitsTree_BalticSea_RFD_lo
FruitsTree_BarentsSea_RFD_hi
FruitsTree_BarentsSea_RFD_lo
FruitsTree_BengalBay_IRR_hi
FruitsTree_BengalBay_IRR_lo
FruitsTree_BengalBay_RFD_hi
FruitsTree_BengalBay_RFD_lo
FruitsTree_BengalW_IRR_hi
FruitsTree_BengalW_IRR_lo
FruitsTree_BengalW_RFD_hi
FruitsTree_BengalW_RFD_lo
FruitsTree_BlackSeaN_IRR_hi
FruitsTree_BlackSeaN_IRR_lo
FruitsTree_BlackSeaN_RFD_hi
FruitsTree_BlackSeaN_RFD_lo
FruitsTree_BlackSeaS_IRR_hi
FruitsTree_BlackSeaS_IRR_lo
FruitsTree_BlackSeaS_RFD_hi
FruitsTree_BlackSeaS_RFD_lo
FruitsTree_BoHai_IRR_hi
FruitsTree_BoHai_IRR_lo
FruitsTree_BoHai_RFD_hi
FruitsTree_BoHai_RFD_lo
FruitsTree_BorneoCstN_IRR_hi
FruitsTree_BorneoCstN_IRR_lo
FruitsTree_BorneoCstN_RFD_hi
FruitsTree_BorneoCstN_RFD_lo
FruitsTree_BrahmaniR_IRR_hi
FruitsTree_BrahmaniR_IRR_lo
FruitsTree_BrahmaniR_RFD_hi
FruitsTree_BrahmaniR_RFD_lo
FruitsTree_BrzCstE_IRR_hi
FruitsTree_BrzCstE_IRR_lo
FruitsTree_BrzCstE_RFD_hi
FruitsTree_BrzCstE_RFD_lo
FruitsTree_BrzCstN_IRR_hi
FruitsTree_BrzCstN_IRR_lo
FruitsTree_BrzCstN_RFD_hi
FruitsTree_BrzCstN_RFD_lo
FruitsTree_BrzCstS_IRR_hi
FruitsTree_BrzCstS_IRR_lo
FruitsTree_BrzCstS_RFD_hi
FruitsTree_BrzCstS_RFD_lo
FruitsTree_California_IRR_hi
FruitsTree_California_IRR_lo
FruitsTree_California_RFD_hi
FruitsTree_California_RFD_lo
FruitsTree_CanAtl_IRR_hi
FruitsTree_CanAtl_IRR_lo
FruitsTree_Caribbean_IRR_hi
FruitsTree_Caribbean_IRR_lo
FruitsTree_Caribbean_RFD_hi
FruitsTree_Caribbean_RFD_lo
FruitsTree_CaspianE_IRR_hi
FruitsTree_CaspianE_IRR_lo
FruitsTree_CaspianE_RFD_hi
FruitsTree_CaspianE_RFD_lo
FruitsTree_CaspianNE_IRR_hi
FruitsTree_CaspianNE_IRR_lo
FruitsTree_CaspianNE_RFD_hi
FruitsTree_CaspianNE_RFD_lo
FruitsTree_CaspianSW_IRR_hi
FruitsTree_CaspianSW_IRR_lo
FruitsTree_CaspianSW_RFD_hi
FruitsTree_CaspianSW_RFD_lo
FruitsTree_CauveryR_IRR_hi
FruitsTree_CauveryR_IRR_lo
FruitsTree_CauveryR_RFD_hi
FruitsTree_CauveryR_RFD_lo
FruitsTree_ChaoPhrR_IRR_hi
FruitsTree_ChaoPhrR_IRR_lo

FruitsTree_ChaoPhrR_RFD_hi
FruitsTree_ChaoPhrR_RFD_lo
FruitsTree_ChileCstN_IRR_hi
FruitsTree_ChileCstN_IRR_lo
FruitsTree_ChileCstN_RFD_hi
FruitsTree_ChileCstN_RFD_lo
FruitsTree_ChileCstS_IRR_hi
FruitsTree_ChileCstS_IRR_lo
FruitsTree_ChileCstS_RFD_hi
FruitsTree_ChileCstS_RFD_lo
FruitsTree_ChinaCst_IRR_hi
FruitsTree_ChinaCst_IRR_lo
FruitsTree_ChinaCst_RFD_hi
FruitsTree_ChinaCst_RFD_lo
FruitsTree_CntAmer_IRR_hi
FruitsTree_CntAmer_IRR_lo
FruitsTree_CntAmer_RFD_hi
FruitsTree_CntAmer_RFD_lo
FruitsTree_ColEcuaCst_IRR_hi
FruitsTree_ColEcuaCst_IRR_lo
FruitsTree_ColEcuaCst_RFD_hi
FruitsTree_ColEcuaCst_RFD_lo
FruitsTree_CongoR_IRR_hi
FruitsTree_CongoR_IRR_lo
FruitsTree_CongoR_RFD_hi
FruitsTree_CongoR_RFD_lo
FruitsTree_DanubeR_IRR_hi
FruitsTree_DanubeR_IRR_lo
FruitsTree_DanubeR_RFD_hi
FruitsTree_DanubeR_RFD_lo
FruitsTree_DaugavaR_IRR_hi
FruitsTree_DaugavaR_IRR_lo
FruitsTree_DaugavaR_RFD_hi
FruitsTree_DaugavaR_RFD_lo
FruitsTree_DeadSea_IRR_hi
FruitsTree_DeadSea_IRR_lo
FruitsTree_DeadSea_RFD_hi
FruitsTree_DeadSea_RFD_lo
FruitsTree_DnieperR_IRR_hi
FruitsTree_DnieperR_IRR_lo
FruitsTree_DnieperR_RFD_hi
FruitsTree_DnieperR_RFD_lo
FruitsTree_DniesterR_IRR_hi
FruitsTree_DniesterR_IRR_lo
FruitsTree_DniesterR_RFD_hi
FruitsTree_DniesterR_RFD_lo
FruitsTree_DnkGrmCst_IRR_hi
FruitsTree_DnkGrmCst_IRR_lo
FruitsTree_DnkGrmCst_RFD_hi
FruitsTree_DnkGrmCst_RFD_lo
FruitsTree_DonR_IRR_hi
FruitsTree_DonR_IRR_lo
FruitsTree_DonR_RFD_hi
FruitsTree_DonR_RFD_lo
FruitsTree_DouroR_IRR_hi
FruitsTree_DouroR_IRR_lo
FruitsTree_DouroR_RFD_hi
FruitsTree_DouroR_RFD_lo
FruitsTree_DvinaRN_RFD_hi
FruitsTree_DvinaRN_RFD_lo
FruitsTree_EbroR_IRR_hi
FruitsTree_EbroR_IRR_lo
FruitsTree_EbroR_RFD_hi
FruitsTree_EbroR_RFD_lo
FruitsTree_EJrdnSyr_IRR_hi
FruitsTree_EJrdnSyr_IRR_lo
FruitsTree_EJrdnSyr_RFD_hi
FruitsTree_EJrdnSyr_RFD_lo
FruitsTree_ElbeR_IRR_hi
FruitsTree_ElbeR_IRR_lo
FruitsTree_ElbeR_RFD_hi
FruitsTree_ElbeR_RFD_lo
FruitsTree_EmsWeserR_IRR_hi
FruitsTree_EmsWeserR_IRR_lo
FruitsTree_EmsWeserR_RFD_hi
FruitsTree_EmsWeserR_RFD_lo
FruitsTree_EngWales_IRR_hi
FruitsTree_EngWales_IRR_lo
FruitsTree_EngWales_RFD_hi
FruitsTree_EngWales_RFD_lo
FruitsTree_FarahrudR_IRR_hi
FruitsTree_FarahrudR_IRR_lo
FruitsTree_FarahrudR_RFD_hi
FruitsTree_FarahrudR_RFD_lo
FruitsTree_Finland_RFD_hi
FruitsTree_Finland_RFD_lo
FruitsTree_FlyR_RFD_hi
FruitsTree_FlyR_RFD_lo
FruitsTree_FranceCstS_IRR_hi
FruitsTree_FranceCstS_IRR_lo
FruitsTree_FranceCstS_RFD_hi
FruitsTree_FranceCstS_RFD_lo
FruitsTree_FranceCstW_IRR_hi
FruitsTree_FranceCstW_IRR_lo
FruitsTree_FranceCstW_RFD_hi
FruitsTree_FranceCstW_RFD_lo

FruitsTree_FraserR_IRR_hi
FruitsTree_FraserR_IRR_lo
FruitsTree_GangesR_IRR_hi
FruitsTree_GangesR_IRR_lo
FruitsTree_GangesR_RFD_hi
FruitsTree_GangesR_RFD_lo
FruitsTree_Gironde_IRR_hi
FruitsTree_Gironde_IRR_lo
FruitsTree_Gironde_RFD_hi
FruitsTree_Gironde_RFD_lo
FruitsTree_Gobi_IRR_hi
FruitsTree_Gobi_IRR_lo
FruitsTree_Gobi_RFD_hi
FruitsTree_Gobi_RFD_lo
FruitsTree_GodavariR_IRR_hi
FruitsTree_GodavariR_IRR_lo
FruitsTree_GodavariR_RFD_hi
FruitsTree_GodavariR_RFD_lo
FruitsTree_GreatBasin_IRR_hi
FruitsTree_GreatBasin_IRR_lo
FruitsTree_GreatBasin_RFD_hi
FruitsTree_GreatBasin_RFD_lo
FruitsTree_GreatLakes_IRR_hi
FruitsTree_GreatLakes_IRR_lo
FruitsTree_GreatLakes_RFD_hi
FruitsTree_GreatLakes_RFD_lo
FruitsTree_GrijUsuR_IRR_hi
FruitsTree_GrijUsuR_IRR_lo
FruitsTree_GrijUsuR_RFD_hi
FruitsTree_GrijUsuR_RFD_lo
FruitsTree_GuadalqR_IRR_hi
FruitsTree_GuadalqR_IRR_lo
FruitsTree_GuadalqR_RFD_hi
FruitsTree_GuadalqR_RFD_lo
FruitsTree_GuadianaR_IRR_hi
FruitsTree_GuadianaR_IRR_lo
FruitsTree_GuadianaR_RFD_hi
FruitsTree_GuadianaR_RFD_lo
FruitsTree_GuineaGulf_IRR_hi
FruitsTree_GuineaGulf_IRR_lo
FruitsTree_GuineaGulf_RFD_hi
FruitsTree_GuineaGulf_RFD_lo
FruitsTree_Hainan_IRR_hi
FruitsTree_Hainan_IRR_lo
FruitsTree_Hainan_RFD_hi
FruitsTree_Hainan_RFD_lo
FruitsTree_HamuMashR_IRR_hi
FruitsTree_HamuMashR_IRR_lo
FruitsTree_HamuMashR_RFD_hi
FruitsTree_HamuMashR_RFD_lo
FruitsTree_Helmand_IRR_hi
FruitsTree_Helmand_IRR_lo
FruitsTree_Helmand_RFD_hi
FruitsTree_Helmand_RFD_lo
FruitsTree_Hong_IRR_hi
FruitsTree_Hong_IRR_lo
FruitsTree_Hong_RFD_hi
FruitsTree_Hong_RFD_lo
FruitsTree_HuangHeR_IRR_hi
FruitsTree_HuangHeR_IRR_lo
FruitsTree_HuangHeR_RFD_hi
FruitsTree_HuangHeR_RFD_lo
FruitsTree_HudsonBay_IRR_hi
FruitsTree_HudsonBay_IRR_lo
FruitsTree_IberiaCst_IRR_hi
FruitsTree_IberiaCst_IRR_lo
FruitsTree_IberiaCst_RFD_hi
FruitsTree_IberiaCst_RFD_lo
FruitsTree_IdnE_RFD_hi
FruitsTree_IdnE_RFD_lo
FruitsTree_IndCstE_IRR_hi
FruitsTree_IndCstE_IRR_lo
FruitsTree_IndCstE_RFD_hi
FruitsTree_IndCstE_RFD_lo
FruitsTree_IndCstNE_IRR_hi
FruitsTree_IndCstNE_IRR_lo
FruitsTree_IndCstNE_RFD_hi
FruitsTree_IndCstNE_RFD_lo
FruitsTree_IndCstS_IRR_hi
FruitsTree_IndCstS_IRR_lo
FruitsTree_IndCstS_RFD_hi
FruitsTree_IndCstS_RFD_lo
FruitsTree_IndCstW_IRR_hi
FruitsTree_IndCstW_IRR_lo
FruitsTree_IndCstW_RFD_hi
FruitsTree_IndCstW_RFD_lo
FruitsTree_IndusR_IRR_hi
FruitsTree_IndusR_IRR_lo
FruitsTree_IndusR_RFD_hi
FruitsTree_IndusR_RFD_lo
FruitsTree_Iran_IRR_hi
FruitsTree_Iran_IRR_lo
FruitsTree_Iran_RFD_hi
FruitsTree_Iran_RFD_lo
FruitsTree_Ireland_IRR_hi
FruitsTree_Ireland_IRR_lo

FruitsTree_Ireland_RFD_hi
FruitsTree_Ireland_RFD_lo
FruitsTree_IrianJaya_RFD_hi
FruitsTree_IrianJaya_RFD_lo
FruitsTree_IrrawaddyR_IRR_hi
FruitsTree_IrrawaddyR_IRR_lo
FruitsTree_IrrawaddyR_RFD_hi
FruitsTree_IrrawaddyR_RFD_lo
FruitsTree_ItalyCstE_IRR_hi
FruitsTree_ItalyCstE_IRR_lo
FruitsTree_ItalyCstE_RFD_hi
FruitsTree_ItalyCstE_RFD_lo
FruitsTree_ItalyCstW_IRR_hi
FruitsTree_ItalyCstW_IRR_lo
FruitsTree_ItalyCstW_RFD_hi
FruitsTree_ItalyCstW_RFD_lo
FruitsTree_Japan_IRR_hi
FruitsTree_Japan_IRR_lo
FruitsTree_Japan_RFD_hi
FruitsTree_Japan_RFD_lo
FruitsTree_JavaTimor_RFD_hi
FruitsTree_JavaTimor_RFD_lo
FruitsTree_Kalimantan_RFD_hi
FruitsTree_Kalimantan_RFD_lo
FruitsTree_Korea_IRR_hi
FruitsTree_Korea_IRR_lo
FruitsTree_Korea_RFD_hi
FruitsTree_Korea_RFD_lo
FruitsTree_KrishnaR_IRR_hi
FruitsTree_KrishnaR_IRR_lo
FruitsTree_KrishnaR_RFD_hi
FruitsTree_KrishnaR_RFD_lo
FruitsTree_LaPuna_IRR_hi
FruitsTree_LaPuna_IRR_lo
FruitsTree_LaPuna_RFD_hi
FruitsTree_LaPuna_RFD_lo
FruitsTree_LBalkash_IRR_hi
FruitsTree_LBalkash_IRR_lo
FruitsTree_LBalkash_RFD_hi
FruitsTree_LBalkash_RFD_lo
FruitsTree_LChad_IRR_hi
FruitsTree_LChad_IRR_lo
FruitsTree_LChad_RFD_hi
FruitsTree_LChad_RFD_lo
FruitsTree_LenaR_RFD_hi
FruitsTree_LenaR_RFD_lo
FruitsTree_LimpopoR_IRR_hi
FruitsTree_LimpopoR_IRR_lo
FruitsTree_LimpopoR_RFD_hi
FruitsTree_LimpopoR_RFD_lo
FruitsTree_LoireR_IRR_hi
FruitsTree_LoireR_IRR_lo
FruitsTree_LoireR_RFD_hi
FruitsTree_LoireR_RFD_lo
FruitsTree_Madagascar_RFD_hi
FruitsTree_Madagascar_RFD_lo
FruitsTree_MagdalenaR_IRR_hi
FruitsTree_MagdalenaR_IRR_lo
FruitsTree_MagdalenaR_RFD_hi
FruitsTree_MagdalenaR_RFD_lo
FruitsTree_MahanadiR_IRR_hi
FruitsTree_MahanadiR_IRR_lo
FruitsTree_MahanadiR_RFD_hi
FruitsTree_MahanadiR_RFD_lo
FruitsTree_MahiR_IRR_hi
FruitsTree_MahiR_IRR_lo
FruitsTree_MahiR_RFD_hi
FruitsTree_MahiR_RFD_lo
FruitsTree_MalaysiaP_IRR_hi
FruitsTree_MalaysiaP_IRR_lo
FruitsTree_MalaysiaP_RFD_hi
FruitsTree_MalaysiaP_RFD_lo
FruitsTree_MarChiq_IRR_hi
FruitsTree_MarChiq_IRR_lo
FruitsTree_MarChiq_RFD_hi
FruitsTree_MarChiq_RFD_lo
FruitsTree_MeditE_IRR_hi
FruitsTree_MeditE_IRR_lo
FruitsTree_MeditE_RFD_hi
FruitsTree_MeditE_RFD_lo
FruitsTree_MeditIsl_IRR_hi
FruitsTree_MeditIsl_IRR_lo
FruitsTree_MeditIsl_RFD_hi
FruitsTree_MeditIsl_RFD_lo
FruitsTree_MeditS_IRR_hi
FruitsTree_MeditS_IRR_lo
FruitsTree_MeditS_RFD_hi
FruitsTree_MeditS_RFD_lo
FruitsTree_Mekong_IRR_hi
FruitsTree_Mekong_IRR_lo
FruitsTree_Mekong_RFD_hi
FruitsTree_Mekong_RFD_lo
FruitsTree_MexBaja_IRR_hi
FruitsTree_MexBaja_IRR_lo
FruitsTree_MexBaja_RFD_hi
FruitsTree_MexBaja_RFD_lo

FruitsTree_MexCstNW_IRR_hi
FruitsTree_MexCstNW_IRR_lo
FruitsTree_MexCstNW_RFD_hi
FruitsTree_MexCstNW_RFD_lo
FruitsTree_MexCstW_IRR_hi
FruitsTree_MexCstW_IRR_lo
FruitsTree_MexCstW_RFD_hi
FruitsTree_MexCstW_RFD_lo
FruitsTree_MexGulf_IRR_hi
FruitsTree_MexGulf_IRR_lo
FruitsTree_MexGulf_RFD_hi
FruitsTree_MexGulf_RFD_lo
FruitsTree_MexInt_IRR_hi
FruitsTree_MexInt_IRR_lo
FruitsTree_MexInt_RFD_hi
FruitsTree_MexInt_RFD_lo
FruitsTree_MissouriR_IRR_hi
FruitsTree_MissouriR_IRR_lo
FruitsTree_MissouriR_RFD_hi
FruitsTree_MissouriR_RFD_lo
FruitsTree_MissppRN_IRR_hi
FruitsTree_MissppRN_IRR_lo
FruitsTree_MissppRN_RFD_hi
FruitsTree_MissppRN_RFD_lo
FruitsTree_MissppRS_IRR_hi
FruitsTree_MissppRS_IRR_lo
FruitsTree_MissppRS_RFD_hi
FruitsTree_MissppRS_RFD_lo
FruitsTree_MurrayDrlg_IRR_hi
FruitsTree_MurrayDrlg_IRR_lo
FruitsTree_MurrayDrlg_RFD_hi
FruitsTree_MurrayDrlg_RFD_lo
FruitsTree_NarmadaR_IRR_hi
FruitsTree_NarmadaR_IRR_lo
FruitsTree_NarmadaR_RFD_hi
FruitsTree_NarmadaR_RFD_lo
FruitsTree_NarvaR_IRR_hi
FruitsTree_NarvaR_IRR_lo
FruitsTree_NarvaR_RFD_hi
FruitsTree_NarvaR_RFD_lo
FruitsTree_NegroR_IRR_hi
FruitsTree_NegroR_IRR_lo
FruitsTree_NegroR_RFD_hi
FruitsTree_NegroR_RFD_lo
FruitsTree_NelsonR_IRR_hi
FruitsTree_NelsonR_IRR_lo
FruitsTree_NelsonR_RFD_hi
FruitsTree_NelsonR_RFD_lo
FruitsTree_NemanR_IRR_hi
FruitsTree_NemanR_IRR_lo
FruitsTree_NemanR_RFD_hi
FruitsTree_NemanR_RFD_lo
FruitsTree_NevaR_IRR_hi
FruitsTree_NevaR_IRR_lo
FruitsTree_NevaR_RFD_hi
FruitsTree_NevaR_RFD_lo
FruitsTree_NewCaledn_RFD_hi
FruitsTree_NewCaledn_RFD_lo
FruitsTree_NewZealand_IRR_hi
FruitsTree_NewZealand_IRR_lo
FruitsTree_NewZealand_RFD_hi
FruitsTree_NewZealand_RFD_lo
FruitsTree_NigerR_IRR_hi
FruitsTree_NigerR_IRR_lo
FruitsTree_NigerR_RFD_hi
FruitsTree_NigerR_RFD_lo
FruitsTree_NileR_IRR_hi
FruitsTree_NileR_IRR_lo
FruitsTree_NileR_RFD_hi
FruitsTree_NileR_RFD_lo
FruitsTree_NWTerr_IRR_hi
FruitsTree_NWTerr_IRR_lo
FruitsTree_ObR_IRR_hi
FruitsTree_ObR_IRR_lo
FruitsTree_ObR_RFD_hi
FruitsTree_ObR_RFD_lo
FruitsTree_OderR_IRR_hi
FruitsTree_OderR_IRR_lo
FruitsTree_OderR_RFD_hi
FruitsTree_OderR_RFD_lo
FruitsTree_OhioR_IRR_hi
FruitsTree_OhioR_IRR_lo
FruitsTree_OhioR_RFD_hi
FruitsTree_OhioR_RFD_lo
FruitsTree_OrangeR_IRR_hi
FruitsTree_OrangeR_IRR_lo
FruitsTree_OrangeR_RFD_hi
FruitsTree_OrangeR_RFD_lo
FruitsTree_OrinocoR_IRR_hi
FruitsTree_OrinocoR_IRR_lo
FruitsTree_OrinocoR_RFD_hi
FruitsTree_OrinocoR_RFD_lo
FruitsTree_PacArctic_IRR_hi
FruitsTree_PacArctic_IRR_lo
FruitsTree_Pampas_IRR_hi
FruitsTree_Pampas_IRR_lo

FruitsTree_Pampas_RFD_hi
FruitsTree_Pampas_RFD_lo
FruitsTree_Papaloapan_IRR_hi
FruitsTree_Papaloapan_IRR_lo
FruitsTree_Papaloapan_RFD_hi
FruitsTree_Papaloapan_RFD_lo
FruitsTree_PapuaCst_RFD_hi
FruitsTree_PapuaCst_RFD_lo
FruitsTree_ParnaibaR_IRR_hi
FruitsTree_ParnaibaR_IRR_lo
FruitsTree_ParnaibaR_RFD_hi
FruitsTree_ParnaibaR_RFD_lo
FruitsTree_Patagonia_IRR_hi
FruitsTree_Patagonia_IRR_lo
FruitsTree_Patagonia_RFD_hi
FruitsTree_Patagonia_RFD_lo
FruitsTree_PennarR_IRR_hi
FruitsTree_PennarR_IRR_lo
FruitsTree_PennarR_RFD_hi
FruitsTree_PennarR_RFD_lo
FruitsTree_PersianGulf_IRR_hi
FruitsTree_PersianGulf_IRR_lo
FruitsTree_PersianGulf_RFD_hi
FruitsTree_PersianGulf_RFD_lo
FruitsTree_PeruCst_IRR_hi
FruitsTree_PeruCst_IRR_lo
FruitsTree_PeruCst_RFD_hi
FruitsTree_PeruCst_RFD_lo
FruitsTree_Phlppns_RFD_hi
FruitsTree_Phlppns_RFD_lo
FruitsTree_PolandCst_IRR_hi
FruitsTree_PolandCst_IRR_lo
FruitsTree_PolandCst_RFD_hi
FruitsTree_PolandCst_RFD_lo
FruitsTree_PoR_IRR_hi
FruitsTree_PoR_IRR_lo
FruitsTree_PoR_RFD_hi
FruitsTree_PoR_RFD_lo
FruitsTree_RedSeaE_IRR_hi
FruitsTree_RedSeaE_IRR_lo
FruitsTree_RedSeaE_RFD_hi
FruitsTree_RedSeaE_RFD_lo
FruitsTree_RhineR_IRR_hi
FruitsTree_RhineR_IRR_lo
FruitsTree_RhineR_RFD_hi
FruitsTree_RhineR_RFD_lo
FruitsTree_RhoneR_IRR_hi
FruitsTree_RhoneR_IRR_lo
FruitsTree_RhoneR_RFD_hi
FruitsTree_RhoneR_RFD_lo
FruitsTree_RiftValley_IRR_hi
FruitsTree_RiftValley_IRR_lo
FruitsTree_RiftValley_RFD_hi
FruitsTree_RiftValley_RFD_lo
FruitsTree_RioBalsas_IRR_hi
FruitsTree_RioBalsas_IRR_lo
FruitsTree_RioBalsas_RFD_hi
FruitsTree_RioBalsas_RFD_lo
FruitsTree_RioGrande_IRR_hi
FruitsTree_RioGrande_IRR_lo
FruitsTree_RioGrande_RFD_hi
FruitsTree_RioGrande_RFD_lo
FruitsTree_RioLaPlata_IRR_hi
FruitsTree_RioLaPlata_IRR_lo
FruitsTree_RioLaPlata_RFD_hi
FruitsTree_RioLaPlata_RFD_lo
FruitsTree_RioLerma_IRR_hi
FruitsTree_RioLerma_IRR_lo
FruitsTree_RioLerma_RFD_hi
FruitsTree_RioLerma_RFD_lo
FruitsTree_RioVerde_IRR_hi
FruitsTree_RioVerde_IRR_lo
FruitsTree_RioVerde_RFD_hi
FruitsTree_RioVerde_RFD_lo
FruitsTree_RusCstSE_IRR_hi
FruitsTree_RusCstSE_IRR_lo
FruitsTree_RusCstSE_RFD_hi
FruitsTree_RusCstSE_RFD_lo
FruitsTree_SabarmatiR_IRR_hi
FruitsTree_SabarmatiR_IRR_lo
FruitsTree_SabarmatiR_RFD_hi
FruitsTree_SabarmatiR_RFD_lo
FruitsTree_Salinas_IRR_hi
FruitsTree_Salinas_IRR_lo
FruitsTree_Salinas_RFD_hi
FruitsTree_Salinas_RFD_lo
FruitsTree_Salween_IRR_hi
FruitsTree_Salween_IRR_lo
FruitsTree_Salween_RFD_hi
FruitsTree_Salween_RFD_lo
FruitsTree_SAmerCstN_IRR_hi
FruitsTree_SAmerCstN_IRR_lo
FruitsTree_SAmerCstN_RFD_hi
FruitsTree_SAmerCstN_RFD_lo
FruitsTree_SAmerCstNE_IRR_hi
FruitsTree_SAmerCstNE_IRR_lo

FruitsTree_SAmerCstNE_RFD_hi
FruitsTree_SAmerCstNE_RFD_lo
FruitsTree_SaoFrancR_IRR_hi
FruitsTree_SaoFrancR_IRR_lo
FruitsTree_SaoFrancR_RFD_hi
FruitsTree_SaoFrancR_RFD_lo
FruitsTree_ScheldtR_IRR_hi
FruitsTree_ScheldtR_IRR_lo
FruitsTree_ScheldtR_RFD_hi
FruitsTree_ScheldtR_RFD_lo
FruitsTree_SChinaSea_IRR_hi
FruitsTree_SChinaSea_IRR_lo
FruitsTree_SChinaSea_RFD_hi
FruitsTree_SChinaSea_RFD_lo
FruitsTree_ScndnvN_IRR_hi
FruitsTree_ScndnvN_IRR_lo
FruitsTree_Scotland_IRR_hi
FruitsTree_Scotland_IRR_lo
FruitsTree_Scotland_RFD_hi
FruitsTree_Scotland_RFD_lo
FruitsTree_SeineR_IRR_hi
FruitsTree_SeineR_IRR_lo
FruitsTree_SeineR_RFD_hi
FruitsTree_SeineR_RFD_lo
FruitsTree_SenegalR_IRR_hi
FruitsTree_SenegalR_IRR_lo
FruitsTree_SenegalR_RFD_hi
FruitsTree_SenegalR_RFD_lo
FruitsTree_SepikR_RFD_hi
FruitsTree_SepikR_RFD_lo
FruitsTree_ShebJubR_IRR_hi
FruitsTree_ShebJubR_IRR_lo
FruitsTree_ShebJubR_RFD_hi
FruitsTree_ShebJubR_RFD_lo
FruitsTree_SiberiaW_RFD_hi
FruitsTree_SiberiaW_RFD_lo
FruitsTree_SinaiP_IRR_hi
FruitsTree_SinaiP_IRR_lo
FruitsTree_SinaiP_RFD_hi
FruitsTree_SinaiP_RFD_lo
FruitsTree_SittaungR_IRR_hi
FruitsTree_SittaungR_IRR_lo
FruitsTree_SittaungR_RFD_hi
FruitsTree_SittaungR_RFD_lo
FruitsTree_SolomonIsl_RFD_hi
FruitsTree_SolomonIsl_RFD_lo
FruitsTree_SpainCstSE_IRR_hi
FruitsTree_SpainCstSE_IRR_lo
FruitsTree_SpainCstSE_RFD_hi
FruitsTree_SpainCstSE_RFD_lo
FruitsTree_SriLanka_RFD_hi
FruitsTree_SriLanka_RFD_lo
FruitsTree_StLwrncR_IRR_hi
FruitsTree_StLwrncR_IRR_lo
FruitsTree_Sulawesi_RFD_hi
FruitsTree_Sulawesi_RFD_lo
FruitsTree_Sumatra_RFD_hi
FruitsTree_Sumatra_RFD_lo
FruitsTree_Sweden_IRR_hi
FruitsTree_Sweden_IRR_lo
FruitsTree_Sweden_RFD_hi
FruitsTree_Sweden_RFD_lo
FruitsTree_SyrDaryaR_IRR_hi
FruitsTree_SyrDaryaR_IRR_lo
FruitsTree_SyrDaryaR_RFD_hi
FruitsTree_SyrDaryaR_RFD_lo
FruitsTree_TagusR_IRR_hi
FruitsTree_TagusR_IRR_lo
FruitsTree_TagusR_RFD_hi
FruitsTree_TagusR_RFD_lo
FruitsTree_Taiwan_IRR_hi
FruitsTree_Taiwan_IRR_lo
FruitsTree_Taiwan_RFD_hi
FruitsTree_Taiwan_RFD_lo
FruitsTree_TaptiR_IRR_hi
FruitsTree_TaptiR_IRR_lo
FruitsTree_TaptiR_RFD_hi
FruitsTree_TaptiR_RFD_lo
FruitsTree_Tarim_IRR_hi
FruitsTree_Tarim_IRR_lo
FruitsTree_Tarim_RFD_hi
FruitsTree_Tarim_RFD_lo
FruitsTree_Tasmania_IRR_hi
FruitsTree_Tasmania_IRR_lo
FruitsTree_Tasmania_RFD_hi
FruitsTree_Tasmania_RFD_lo
FruitsTree_Tehuantpc_IRR_hi
FruitsTree_Tehuantpc_IRR_lo
FruitsTree_Tehuantpc_RFD_hi
FruitsTree_Tehuantpc_RFD_lo
FruitsTree_TennR_IRR_hi
FruitsTree_TennR_IRR_lo
FruitsTree_TennR_RFD_hi
FruitsTree_TennR_RFD_lo
FruitsTree_TexasCst_IRR_hi
FruitsTree_TexasCst_IRR_lo

FruitsTree_TexasCst_RFD_hi
FruitsTree_TexasCst_RFD_lo
FruitsTree_ThaiGulf_IRR_hi
FruitsTree_ThaiGulf_IRR_lo
FruitsTree_ThaiGulf_RFD_hi
FruitsTree_ThaiGulf_RFD_lo
FruitsTree_TiberR_IRR_hi
FruitsTree_TiberR_IRR_lo
FruitsTree_TiberR_RFD_hi
FruitsTree_TiberR_RFD_lo
FruitsTree_TigrEuphR_IRR_hi
FruitsTree_TigrEuphR_IRR_lo
FruitsTree_TigrEuphR_RFD_hi
FruitsTree_TigrEuphR_RFD_lo
FruitsTree_TocantinsR_IRR_hi
FruitsTree_TocantinsR_IRR_lo
FruitsTree_TocantinsR_RFD_hi
FruitsTree_TocantinsR_RFD_lo
FruitsTree_UralR_IRR_hi
FruitsTree_UralR_IRR_lo
FruitsTree_UralR_RFD_hi
FruitsTree_UralR_RFD_lo
FruitsTree_UsaColoRN_IRR_hi
FruitsTree_UsaColoRN_IRR_lo
FruitsTree_UsaColoRN_RFD_hi
FruitsTree_UsaColoRN_RFD_lo
FruitsTree_UsaColoRS_IRR_hi
FruitsTree_UsaColoRS_IRR_lo
FruitsTree_UsaColoRS_RFD_hi
FruitsTree_UsaColoRS_RFD_lo
FruitsTree_UsaCstE_IRR_hi
FruitsTree_UsaCstE_IRR_lo
FruitsTree_UsaCstE_RFD_hi
FruitsTree_UsaCstE_RFD_lo
FruitsTree_UsaCstNE_IRR_hi
FruitsTree_UsaCstNE_IRR_lo
FruitsTree_UsaCstNE_RFD_hi
FruitsTree_UsaCstNE_RFD_lo
FruitsTree_UsaCstSE_IRR_hi
FruitsTree_UsaCstSE_IRR_lo
FruitsTree_UsaCstSE_RFD_hi
FruitsTree_UsaCstSE_RFD_lo
FruitsTree_UsaPacNW_IRR_hi
FruitsTree_UsaPacNW_IRR_lo
FruitsTree_UsaPacNW_RFD_hi
FruitsTree_UsaPacNW_RFD_lo
FruitsTree_VietnamCst_IRR_hi
FruitsTree_VietnamCst_IRR_lo
FruitsTree_VietnamCst_RFD_hi
FruitsTree_VietnamCst_RFD_lo
FruitsTree_VolgaR_IRR_hi
FruitsTree_VolgaR_IRR_lo
FruitsTree_VolgaR_RFD_hi
FruitsTree_VolgaR_RFD_lo
FruitsTree_VoltaR_IRR_hi
FruitsTree_VoltaR_IRR_lo
FruitsTree_VoltaR_RFD_hi
FruitsTree_VoltaR_RFD_lo
FruitsTree_WislaR_IRR_hi
FruitsTree_WislaR_IRR_lo
FruitsTree_WislaR_RFD_hi
FruitsTree_WislaR_RFD_lo
FruitsTree_XunJiang_IRR_hi
FruitsTree_XunJiang_IRR_lo
FruitsTree_XunJiang_RFD_hi
FruitsTree_XunJiang_RFD_lo
FruitsTree_Yangtze_IRR_hi
FruitsTree_Yangtze_IRR_lo
FruitsTree_Yangtze_RFD_hi
FruitsTree_Yangtze_RFD_lo
FruitsTree_YeniseiR_IRR_hi
FruitsTree_YeniseiR_IRR_lo
FruitsTree_YeniseiR_RFD_hi
FruitsTree_YeniseiR_RFD_lo
FruitsTree_YucatanP_IRR_hi
FruitsTree_YucatanP_IRR_lo
FruitsTree_YucatanP_RFD_hi
FruitsTree_YucatanP_RFD_lo
FruitsTree_ZambeziR_IRR_hi
FruitsTree_ZambeziR_IRR_lo
FruitsTree_ZambeziR_RFD_hi
FruitsTree_ZambeziR_RFD_lo
FruitsTree_ZiyaHe_IRR_hi
FruitsTree_ZiyaHe_IRR_lo
FruitsTree_ZiyaHe_RFD_hi
FruitsTree_ZiyaHe_RFD_lo
FT biofuels
FT biofuels CCS level 1
FT biofuels CCS level 2
gas
gas (CC CCS)
gas (CC)
gas (steam/CT)
gas to liquids
GrasslandFires_AdnNicIsl
GrasslandFires_AdrBlkSea

GrasslandFires_AfrCstE
GrasslandFires_AfrCstNE
GrasslandFires_AfrCstNW
GrasslandFires_AfrCstS
GrasslandFires_AfrCstSE
GrasslandFires_AfrCstSSW
GrasslandFires_AfrCstSW
GrasslandFires_AfrCstW
GrasslandFires_AfrIntN
GrasslandFires_AfrIntS
GrasslandFires_AmazonR
GrasslandFires_AmuDaryaR
GrasslandFires_AmurR
GrasslandFires_AngolaCst
GrasslandFires_ArabianP
GrasslandFires_ArabianSea
GrasslandFires_ArgColoR
GrasslandFires_ArgCstN
GrasslandFires_ArgCstS
GrasslandFires_ArkWhtRedR
GrasslandFires_AusCstE
GrasslandFires_AusCstN
GrasslandFires_AusCstS
GrasslandFires_AusCstW
GrasslandFires_AusInt
GrasslandFires_BalticSea
GrasslandFires_BarentsSea
GrasslandFires_BengalBay
GrasslandFires_BengalW
GrasslandFires_BlackSeaN
GrasslandFires_BlackSeaS
GrasslandFires_BoHai
GrasslandFires_BorneoCstN
GrasslandFires_BrahmaniR
GrasslandFires_BrzCstE
GrasslandFires_BrzCstN
GrasslandFires_BrzCstS
GrasslandFires_California
GrasslandFires_CanAtl
GrasslandFires_Caribbean
GrasslandFires_CaspianE
GrasslandFires_CaspianNE
GrasslandFires_CaspianSW
GrasslandFires_CauveryR
GrasslandFires_ChaoPhrR
GrasslandFires_ChileCstN
GrasslandFires_ChileCstS
GrasslandFires_ChinaCst
GrasslandFires_ChurchillR
GrasslandFires_CntAmer
GrasslandFires_ColEcuaCst
GrasslandFires_CongoR
GrasslandFires_DanubeR
GrasslandFires_DaugavaR
GrasslandFires_DeadSea
GrasslandFires_DnieperR
GrasslandFires_DniesterR
GrasslandFires_DnkGrmCst
GrasslandFires_DonR
GrasslandFires_DouroR
GrasslandFires_DvinaRN
GrasslandFires_EbroR
GrasslandFires_EJrdnSyr
GrasslandFires_ElbeR
GrasslandFires_EmsWeserR
GrasslandFires_EngWales
GrasslandFires_FarahrudR
GrasslandFires_Finland
GrasslandFires_FlyR
GrasslandFires_FranceCstS
GrasslandFires_FranceCstW
GrasslandFires_FraserR
GrasslandFires_GangesR
GrasslandFires_Gironde
GrasslandFires_Gobi
GrasslandFires_GodavariR
GrasslandFires_GreatBasin
GrasslandFires_GreatLakes
GrasslandFires_GrijUsuR
GrasslandFires_GuadalqR
GrasslandFires_GuadianaR
GrasslandFires_GuineaGulf
GrasslandFires_Hainan
GrasslandFires_HamuMashR
GrasslandFires_Hawaii
GrasslandFires_Helmand
GrasslandFires_Hong
GrasslandFires_HuangHeR
GrasslandFires_HudsonBay
GrasslandFires_IberiaCst
GrasslandFires_Iceland
GrasslandFires_IdnE
GrasslandFires_IndCstE
GrasslandFires_IndCstNE
GrasslandFires_IndCstS
GrasslandFires_IndCstW

GrasslandFires_IndusR
GrasslandFires_Iran
GrasslandFires_Ireland
GrasslandFires_IrianJaya
GrasslandFires_IrrawaddyR
GrasslandFires_ItalyCstE
GrasslandFires_ItalyCstW
GrasslandFires_Japan
GrasslandFires_JavaTimor
GrasslandFires_Kalimantan
GrasslandFires_KaraSea
GrasslandFires_Korea
GrasslandFires_KrishnaR
GrasslandFires_LaPuna
GrasslandFires_LBalkash
GrasslandFires_LChad
GrasslandFires_LenaR
GrasslandFires_LimpopoR
GrasslandFires_LoireR
GrasslandFires_Mackenzie
GrasslandFires_Madagascar
GrasslandFires_MagdalenaR
GrasslandFires_MahanadiR
GrasslandFires_MahiR
GrasslandFires_MalaysiaP
GrasslandFires_MarChiq
GrasslandFires_MeditE
GrasslandFires_MeditIsl
GrasslandFires_MeditS
GrasslandFires_Mekong
GrasslandFires_MexBaja
GrasslandFires_MexCstNW
GrasslandFires_MexCstW
GrasslandFires_MexGulf
GrasslandFires_MexInt
GrasslandFires_MissouriR
GrasslandFires_MissppRN
GrasslandFires_MissppRS
GrasslandFires_MurrayDrlg
GrasslandFires_NarmadaR
GrasslandFires_NarvaR
GrasslandFires_NegroR
GrasslandFires_NelsonR
GrasslandFires_NemanR
GrasslandFires_NevaR
GrasslandFires_NewCaledn
GrasslandFires_NewZealand
GrasslandFires_NigerR
GrasslandFires_NileR
GrasslandFires_NWTerr
GrasslandFires_ObR
GrasslandFires_OderR
GrasslandFires_OhioR
GrasslandFires_OrangeR
GrasslandFires_OrinocoR
GrasslandFires_PacArctic
GrasslandFires_Pampas
GrasslandFires_Papaloapan
GrasslandFires_PapuaCst
GrasslandFires_ParnaibaR
GrasslandFires_Patagonia
GrasslandFires_PennarR
GrasslandFires_PersianGulf
GrasslandFires_PeruCst
GrasslandFires_Phlppns
GrasslandFires_PolandCst
GrasslandFires_PoR
GrasslandFires_RedSeaE
GrasslandFires_RhineR
GrasslandFires_RhoneR
GrasslandFires_RiftValley
GrasslandFires_RioBalsas
GrasslandFires_RioGrande
GrasslandFires_RioLaPlata
GrasslandFires_RioLerma
GrasslandFires_RioVerde
GrasslandFires_RusCstSE
GrasslandFires_SabarmatiR
GrasslandFires_Salinas
GrasslandFires_Salween
GrasslandFires_SAmerCstN
GrasslandFires_SAmerCstNE
GrasslandFires_SaoFrancR
GrasslandFires_ScheldtR
GrasslandFires_SChinaSea
GrasslandFires_ScndnvN
GrasslandFires_Scotland
GrasslandFires_SeineR
GrasslandFires_SenegalR
GrasslandFires_SepikR
GrasslandFires_ShebJubR
GrasslandFires_SiberiaN
GrasslandFires_SiberiaW
GrasslandFires_SittaungR
GrasslandFires_SolomonIsl
GrasslandFires_SpainCstSE

GrasslandFires_SriLanka
GrasslandFires_StLwrncR
GrasslandFires_Sulawesi
GrasslandFires_Sumatra
GrasslandFires_Sweden
GrasslandFires_SyrDaryaR
GrasslandFires_TagusR
GrasslandFires_Taiwan
GrasslandFires_TaptiR
GrasslandFires_Tarim
GrasslandFires_Tasmania
GrasslandFires_Tehuantpc
GrasslandFires_TennR
GrasslandFires_TexasCst
GrasslandFires_ThaiGulf
GrasslandFires_TiberR
GrasslandFires_Tibet
GrasslandFires_TigrEuphR
GrasslandFires_TocantinsR
GrasslandFires_UralR
GrasslandFires_UsaColoRN
GrasslandFires_UsaColoRS
GrasslandFires_UsaCstE
GrasslandFires_UsaCstNE
GrasslandFires_UsaCstSE
GrasslandFires_UsaPacNW
GrasslandFires_VietnamCst
GrasslandFires_VolgaR
GrasslandFires_VoltaR
GrasslandFires_WislaR
GrasslandFires_XunJiang
GrasslandFires_Yangtze
GrasslandFires_YeniseiR
GrasslandFires_YucatanP
GrasslandFires_ZambeziR
GrasslandFires_ZiyaHe
HCFC_22_Prod
landfills
Legumes_AdrBlkSea_IRR_hi
Legumes_AdrBlkSea_IRR_lo
Legumes_AdrBlkSea_RFD_hi
Legumes_AdrBlkSea_RFD_lo
Legumes_AfrCstE_RFD_hi
Legumes_AfrCstE_RFD_lo
Legumes_AfrCstNE_IRR_hi
Legumes_AfrCstNE_IRR_lo
Legumes_AfrCstNE_RFD_hi
Legumes_AfrCstNE_RFD_lo
Legumes_AfrCstNW_IRR_hi
Legumes_AfrCstNW_IRR_lo
Legumes_AfrCstNW_RFD_hi
Legumes_AfrCstNW_RFD_lo
Legumes_AfrCstS_IRR_hi
Legumes_AfrCstS_IRR_lo
Legumes_AfrCstS_RFD_hi
Legumes_AfrCstS_RFD_lo
Legumes_AfrCstSE_IRR_hi
Legumes_AfrCstSE_IRR_lo
Legumes_AfrCstSE_RFD_hi
Legumes_AfrCstSE_RFD_lo
Legumes_AfrCstSSW_IRR_hi
Legumes_AfrCstSSW_IRR_lo
Legumes_AfrCstSW_RFD_hi
Legumes_AfrCstSW_RFD_lo
Legumes_AfrCstW_IRR_hi
Legumes_AfrCstW_IRR_lo
Legumes_AfrCstW_RFD_hi
Legumes_AfrCstW_RFD_lo
Legumes_AfrIntN_IRR_hi
Legumes_AfrIntN_IRR_lo
Legumes_AfrIntN_RFD_hi
Legumes_AfrIntN_RFD_lo
Legumes_AfrIntS_RFD_hi
Legumes_AfrIntS_RFD_lo
Legumes_AmazonR_IRR_hi
Legumes_AmazonR_IRR_lo
Legumes_AmazonR_RFD_hi
Legumes_AmazonR_RFD_lo
Legumes_AmuDaryaR_IRR_hi
Legumes_AmuDaryaR_IRR_lo
Legumes_AmuDaryaR_RFD_hi
Legumes_AmuDaryaR_RFD_lo
Legumes_AmurR_IRR_hi
Legumes_AmurR_IRR_lo
Legumes_AmurR_RFD_hi
Legumes_AmurR_RFD_lo
Legumes_AngolaCst_RFD_hi
Legumes_AngolaCst_RFD_lo
Legumes_ArabianP_IRR_hi
Legumes_ArabianP_IRR_lo
Legumes_ArabianP_RFD_hi
Legumes_ArabianP_RFD_lo
Legumes_ArabianSea_IRR_hi
Legumes_ArabianSea_IRR_lo
Legumes_ArabianSea_RFD_hi
Legumes_ArabianSea_RFD_lo

Legumes_ArgColoR_IRR_hi
Legumes_ArgColoR_IRR_lo
Legumes_ArgColoR_RFD_hi
Legumes_ArgColoR_RFD_lo
Legumes_ArgCstN_IRR_hi
Legumes_ArgCstN_IRR_lo
Legumes_ArgCstN_RFD_hi
Legumes_ArgCstN_RFD_lo
Legumes_ArgCstS_IRR_hi
Legumes_ArgCstS_IRR_lo
Legumes_ArgCstS_RFD_hi
Legumes_ArgCstS_RFD_lo
Legumes_ArkWhtRedR_IRR_hi
Legumes_ArkWhtRedR_IRR_lo
Legumes_ArkWhtRedR_RFD_hi
Legumes_ArkWhtRedR_RFD_lo
Legumes_AusCstE_RFD_hi
Legumes_AusCstE_RFD_lo
Legumes_AusCstN_RFD_hi
Legumes_AusCstN_RFD_lo
Legumes_AusCstS_RFD_hi
Legumes_AusCstS_RFD_lo
Legumes_AusCstW_RFD_hi
Legumes_AusCstW_RFD_lo
Legumes_AusInt_RFD_hi
Legumes_AusInt_RFD_lo
Legumes_BalticSea_IRR_hi
Legumes_BalticSea_IRR_lo
Legumes_BalticSea_RFD_hi
Legumes_BalticSea_RFD_lo
Legumes_BarentsSea_IRR_hi
Legumes_BarentsSea_IRR_lo
Legumes_BarentsSea_RFD_hi
Legumes_BarentsSea_RFD_lo
Legumes_BengalBay_IRR_hi
Legumes_BengalBay_IRR_lo
Legumes_BengalBay_RFD_hi
Legumes_BengalBay_RFD_lo
Legumes_BengalW_IRR_hi
Legumes_BengalW_IRR_lo
Legumes_BengalW_RFD_hi
Legumes_BengalW_RFD_lo
Legumes_BlackSeaN_IRR_hi
Legumes_BlackSeaN_IRR_lo
Legumes_BlackSeaN_RFD_hi
Legumes_BlackSeaN_RFD_lo
Legumes_BlackSeaS_IRR_hi
Legumes_BlackSeaS_IRR_lo
Legumes_BlackSeaS_RFD_hi
Legumes_BlackSeaS_RFD_lo
Legumes_BoHai_IRR_hi
Legumes_BoHai_IRR_lo
Legumes_BoHai_RFD_hi
Legumes_BoHai_RFD_lo
Legumes_BorneoCstN_IRR_hi
Legumes_BorneoCstN_IRR_lo
Legumes_BorneoCstN_RFD_hi
Legumes_BorneoCstN_RFD_lo
Legumes_BrahmaniR_IRR_hi
Legumes_BrahmaniR_IRR_lo
Legumes_BrahmaniR_RFD_hi
Legumes_BrahmaniR_RFD_lo
Legumes_BrzCstE_IRR_hi
Legumes_BrzCstE_IRR_lo
Legumes_BrzCstE_RFD_hi
Legumes_BrzCstE_RFD_lo
Legumes_BrzCstN_IRR_hi
Legumes_BrzCstN_IRR_lo
Legumes_BrzCstN_RFD_hi
Legumes_BrzCstN_RFD_lo
Legumes_BrzCstS_IRR_hi
Legumes_BrzCstS_IRR_lo
Legumes_BrzCstS_RFD_hi
Legumes_BrzCstS_RFD_lo
Legumes_California_IRR_hi
Legumes_California_IRR_lo
Legumes_California_RFD_hi
Legumes_California_RFD_lo
Legumes_CanAtl_RFD_hi
Legumes_CanAtl_RFD_lo
Legumes_Caribbean_IRR_hi
Legumes_Caribbean_IRR_lo
Legumes_Caribbean_RFD_hi
Legumes_Caribbean_RFD_lo
Legumes_CaspianE_IRR_hi
Legumes_CaspianE_IRR_lo
Legumes_CaspianE_RFD_hi
Legumes_CaspianE_RFD_lo
Legumes_CaspianNE_IRR_hi
Legumes_CaspianNE_IRR_lo
Legumes_CaspianNE_RFD_hi
Legumes_CaspianNE_RFD_lo
Legumes_CaspianSW_IRR_hi
Legumes_CaspianSW_IRR_lo
Legumes_CaspianSW_RFD_hi
Legumes_CaspianSW_RFD_lo

Legumes_CauveryR_IRR_hi
Legumes_CauveryR_IRR_lo
Legumes_CauveryR_RFD_hi
Legumes_CauveryR_RFD_lo
Legumes_ChaoPhrR_RFD_hi
Legumes_ChaoPhrR_RFD_lo
Legumes_ChileCstN_RFD_hi
Legumes_ChileCstN_RFD_lo
Legumes_ChileCstS_IRR_hi
Legumes_ChileCstS_IRR_lo
Legumes_ChileCstS_RFD_hi
Legumes_ChileCstS_RFD_lo
Legumes_ChinaCst_RFD_hi
Legumes_ChinaCst_RFD_lo
Legumes_CntAmer_IRR_hi
Legumes_CntAmer_IRR_lo
Legumes_CntAmer_RFD_hi
Legumes_CntAmer_RFD_lo
Legumes_ColEcuaCst_IRR_hi
Legumes_ColEcuaCst_IRR_lo
Legumes_ColEcuaCst_RFD_hi
Legumes_ColEcuaCst_RFD_lo
Legumes_CongoR_RFD_hi
Legumes_CongoR_RFD_lo
Legumes_DanubeR_IRR_hi
Legumes_DanubeR_IRR_lo
Legumes_DanubeR_RFD_hi
Legumes_DanubeR_RFD_lo
Legumes_DaugavaR_IRR_hi
Legumes_DaugavaR_IRR_lo
Legumes_DaugavaR_RFD_hi
Legumes_DaugavaR_RFD_lo
Legumes_DeadSea_IRR_hi
Legumes_DeadSea_IRR_lo
Legumes_DeadSea_RFD_hi
Legumes_DeadSea_RFD_lo
Legumes_DnieperR_IRR_hi
Legumes_DnieperR_IRR_lo
Legumes_DnieperR_RFD_hi
Legumes_DnieperR_RFD_lo
Legumes_DniesterR_IRR_hi
Legumes_DniesterR_IRR_lo
Legumes_DniesterR_RFD_hi
Legumes_DniesterR_RFD_lo
Legumes_DnkGrmCst_RFD_hi
Legumes_DnkGrmCst_RFD_lo
Legumes_DonR_IRR_hi
Legumes_DonR_IRR_lo
Legumes_DonR_RFD_hi
Legumes_DonR_RFD_lo
Legumes_DouroR_IRR_hi
Legumes_DouroR_IRR_lo
Legumes_DouroR_RFD_hi
Legumes_DouroR_RFD_lo
Legumes_DvinaRN_IRR_hi
Legumes_DvinaRN_IRR_lo
Legumes_DvinaRN_RFD_hi
Legumes_DvinaRN_RFD_lo
Legumes_EbroR_IRR_hi
Legumes_EbroR_IRR_lo
Legumes_EbroR_RFD_hi
Legumes_EbroR_RFD_lo
Legumes_EJrdnSyr_IRR_hi
Legumes_EJrdnSyr_IRR_lo
Legumes_EJrdnSyr_RFD_hi
Legumes_EJrdnSyr_RFD_lo
Legumes_ElbeR_RFD_hi
Legumes_ElbeR_RFD_lo
Legumes_EmsWeserR_RFD_hi
Legumes_EmsWeserR_RFD_lo
Legumes_EngWales_RFD_hi
Legumes_EngWales_RFD_lo
Legumes_FarahrudR_IRR_hi
Legumes_FarahrudR_IRR_lo
Legumes_FarahrudR_RFD_hi
Legumes_FarahrudR_RFD_lo
Legumes_Finland_IRR_hi
Legumes_Finland_IRR_lo
Legumes_Finland_RFD_hi
Legumes_Finland_RFD_lo
Legumes_FlyR_RFD_hi
Legumes_FlyR_RFD_lo
Legumes_FranceCstS_IRR_hi
Legumes_FranceCstS_IRR_lo
Legumes_FranceCstS_RFD_hi
Legumes_FranceCstS_RFD_lo
Legumes_FranceCstW_IRR_hi
Legumes_FranceCstW_IRR_lo
Legumes_FranceCstW_RFD_hi
Legumes_FranceCstW_RFD_lo
Legumes_GangesR_IRR_hi
Legumes_GangesR_IRR_lo
Legumes_GangesR_RFD_hi
Legumes_GangesR_RFD_lo
Legumes_Gironde_IRR_hi
Legumes_Gironde_IRR_lo

Legumes_Gironde_RFD_hi
Legumes_Gironde_RFD_lo
Legumes_Gobi_IRR_hi
Legumes_Gobi_IRR_lo
Legumes_Gobi_RFD_hi
Legumes_Gobi_RFD_lo
Legumes_GodavariR_IRR_hi
Legumes_GodavariR_IRR_lo
Legumes_GodavariR_RFD_hi
Legumes_GodavariR_RFD_lo
Legumes_GreatBasin_IRR_hi
Legumes_GreatBasin_IRR_lo
Legumes_GreatBasin_RFD_hi
Legumes_GreatBasin_RFD_lo
Legumes_GreatLakes_IRR_hi
Legumes_GreatLakes_IRR_lo
Legumes_GreatLakes_RFD_hi
Legumes_GreatLakes_RFD_lo
Legumes_GrijUsuR_IRR_hi
Legumes_GrijUsuR_IRR_lo
Legumes_GrijUsuR_RFD_hi
Legumes_GrijUsuR_RFD_lo
Legumes_GuadalqR_IRR_hi
Legumes_GuadalqR_IRR_lo
Legumes_GuadalqR_RFD_hi
Legumes_GuadalqR_RFD_lo
Legumes_GuadianaR_IRR_hi
Legumes_GuadianaR_IRR_lo
Legumes_GuadianaR_RFD_hi
Legumes_GuadianaR_RFD_lo
Legumes_GuineaGulf_IRR_hi
Legumes_GuineaGulf_IRR_lo
Legumes_GuineaGulf_RFD_hi
Legumes_GuineaGulf_RFD_lo
Legumes_Hainan_RFD_hi
Legumes_Hainan_RFD_lo
Legumes_HamuMashR_IRR_hi
Legumes_HamuMashR_IRR_lo
Legumes_HamuMashR_RFD_hi
Legumes_HamuMashR_RFD_lo
Legumes_Helmand_IRR_hi
Legumes_Helmand_IRR_lo
Legumes_Helmand_RFD_hi
Legumes_Helmand_RFD_lo
Legumes_Hong_RFD_hi
Legumes_Hong_RFD_lo
Legumes_HuangHeR_RFD_hi
Legumes_HuangHeR_RFD_lo
Legumes_HudsonBay_RFD_hi
Legumes_HudsonBay_RFD_lo
Legumes_IberiaCst_IRR_hi
Legumes_IberiaCst_IRR_lo
Legumes_IberiaCst_RFD_hi
Legumes_IberiaCst_RFD_lo
Legumes_IdnE_IRR_hi
Legumes_IdnE_IRR_lo
Legumes_IdnE_RFD_hi
Legumes_IdnE_RFD_lo
Legumes_IndCstE_IRR_hi
Legumes_IndCstE_IRR_lo
Legumes_IndCstE_RFD_hi
Legumes_IndCstE_RFD_lo
Legumes_IndCstNE_IRR_hi
Legumes_IndCstNE_IRR_lo
Legumes_IndCstNE_RFD_hi
Legumes_IndCstNE_RFD_lo
Legumes_IndCstS_IRR_hi
Legumes_IndCstS_IRR_lo
Legumes_IndCstS_RFD_hi
Legumes_IndCstS_RFD_lo
Legumes_IndCstW_IRR_hi
Legumes_IndCstW_IRR_lo
Legumes_IndCstW_RFD_hi
Legumes_IndCstW_RFD_lo
Legumes_IndusR_IRR_hi
Legumes_IndusR_IRR_lo
Legumes_IndusR_RFD_hi
Legumes_IndusR_RFD_lo
Legumes_Iran_IRR_hi
Legumes_Iran_IRR_lo
Legumes_Iran_RFD_hi
Legumes_Iran_RFD_lo
Legumes_Ireland_RFD_hi
Legumes_Ireland_RFD_lo
Legumes_IrianJaya_IRR_hi
Legumes_IrianJaya_IRR_lo
Legumes_IrianJaya_RFD_hi
Legumes_IrianJaya_RFD_lo
Legumes_IrrawaddyR_IRR_hi
Legumes_IrrawaddyR_IRR_lo
Legumes_IrrawaddyR_RFD_hi
Legumes_IrrawaddyR_RFD_lo
Legumes_ItalyCstE_RFD_hi
Legumes_ItalyCstE_RFD_lo
Legumes_ItalyCstW_RFD_hi
Legumes_ItalyCstW_RFD_lo

Legumes_Japan_IRR_hi
Legumes_Japan_IRR_lo
Legumes_Japan_RFD_hi
Legumes_Japan_RFD_lo
Legumes_JavaTimor_IRR_hi
Legumes_JavaTimor_IRR_lo
Legumes_JavaTimor_RFD_hi
Legumes_JavaTimor_RFD_lo
Legumes_Kalimantan_IRR_hi
Legumes_Kalimantan_IRR_lo
Legumes_Kalimantan_RFD_hi
Legumes_Kalimantan_RFD_lo
Legumes_Korea_IRR_hi
Legumes_Korea_IRR_lo
Legumes_Korea_RFD_hi
Legumes_Korea_RFD_lo
Legumes_KrishnaR_IRR_hi
Legumes_KrishnaR_IRR_lo
Legumes_KrishnaR_RFD_hi
Legumes_KrishnaR_RFD_lo
Legumes_LaPuna_IRR_hi
Legumes_LaPuna_IRR_lo
Legumes_LaPuna_RFD_hi
Legumes_LaPuna_RFD_lo
Legumes_LBalkash_IRR_hi
Legumes_LBalkash_IRR_lo
Legumes_LBalkash_RFD_hi
Legumes_LBalkash_RFD_lo
Legumes_LChad_IRR_hi
Legumes_LChad_IRR_lo
Legumes_LChad_RFD_hi
Legumes_LChad_RFD_lo
Legumes_LenaR_IRR_hi
Legumes_LenaR_IRR_lo
Legumes_LenaR_RFD_hi
Legumes_LenaR_RFD_lo
Legumes_LimpopoR_IRR_hi
Legumes_LimpopoR_IRR_lo
Legumes_LimpopoR_RFD_hi
Legumes_LimpopoR_RFD_lo
Legumes_LoireR_IRR_hi
Legumes_LoireR_IRR_lo
Legumes_LoireR_RFD_hi
Legumes_LoireR_RFD_lo
Legumes_Mackenzie_RFD_hi
Legumes_Mackenzie_RFD_lo
Legumes_Madagascar_RFD_hi
Legumes_Madagascar_RFD_lo
Legumes_MagdalenaR_RFD_hi
Legumes_MagdalenaR_RFD_lo
Legumes_MahanadiR_IRR_hi
Legumes_MahanadiR_IRR_lo
Legumes_MahanadiR_RFD_hi
Legumes_MahanadiR_RFD_lo
Legumes_MahiR_IRR_hi
Legumes_MahiR_IRR_lo
Legumes_MahiR_RFD_hi
Legumes_MahiR_RFD_lo
Legumes_MalaysiaP_IRR_hi
Legumes_MalaysiaP_IRR_lo
Legumes_MalaysiaP_RFD_hi
Legumes_MalaysiaP_RFD_lo
Legumes_MarChiq_IRR_hi
Legumes_MarChiq_IRR_lo
Legumes_MarChiq_RFD_hi
Legumes_MarChiq_RFD_lo
Legumes_MeditE_IRR_hi
Legumes_MeditE_IRR_lo
Legumes_MeditE_RFD_hi
Legumes_MeditE_RFD_lo
Legumes_MeditIsl_IRR_hi
Legumes_MeditIsl_IRR_lo
Legumes_MeditIsl_RFD_hi
Legumes_MeditIsl_RFD_lo
Legumes_MeditS_IRR_hi
Legumes_MeditS_IRR_lo
Legumes_MeditS_RFD_hi
Legumes_MeditS_RFD_lo
Legumes_Mekong_IRR_hi
Legumes_Mekong_IRR_lo
Legumes_Mekong_RFD_hi
Legumes_Mekong_RFD_lo
Legumes_MexBaja_IRR_hi
Legumes_MexBaja_IRR_lo
Legumes_MexBaja_RFD_hi
Legumes_MexBaja_RFD_lo
Legumes_MexCstNW_IRR_hi
Legumes_MexCstNW_IRR_lo
Legumes_MexCstNW_RFD_hi
Legumes_MexCstNW_RFD_lo
Legumes_MexCstW_IRR_hi
Legumes_MexCstW_IRR_lo
Legumes_MexCstW_RFD_hi
Legumes_MexCstW_RFD_lo
Legumes_MexGulf_IRR_hi
Legumes_MexGulf_IRR_lo

Legumes_MexGulf_RFD_hi
Legumes_MexGulf_RFD_lo
Legumes_MexInt_IRR_hi
Legumes_MexInt_IRR_lo
Legumes_MexInt_RFD_hi
Legumes_MexInt_RFD_lo
Legumes_MissouriR_IRR_hi
Legumes_MissouriR_IRR_lo
Legumes_MissouriR_RFD_hi
Legumes_MissouriR_RFD_lo
Legumes_MissppRN_IRR_hi
Legumes_MissppRN_IRR_lo
Legumes_MissppRN_RFD_hi
Legumes_MissppRN_RFD_lo
Legumes_MissppRS_RFD_hi
Legumes_MissppRS_RFD_lo
Legumes_MurrayDrlg_RFD_hi
Legumes_MurrayDrlg_RFD_lo
Legumes_NarmadaR_IRR_hi
Legumes_NarmadaR_IRR_lo
Legumes_NarmadaR_RFD_hi
Legumes_NarmadaR_RFD_lo
Legumes_NarvaR_IRR_hi
Legumes_NarvaR_IRR_lo
Legumes_NarvaR_RFD_hi
Legumes_NarvaR_RFD_lo
Legumes_NegroR_IRR_hi
Legumes_NegroR_IRR_lo
Legumes_NegroR_RFD_hi
Legumes_NegroR_RFD_lo
Legumes_NelsonR_IRR_hi
Legumes_NelsonR_IRR_lo
Legumes_NelsonR_RFD_hi
Legumes_NelsonR_RFD_lo
Legumes_NemanR_IRR_hi
Legumes_NemanR_IRR_lo
Legumes_NemanR_RFD_hi
Legumes_NemanR_RFD_lo
Legumes_NevaR_IRR_hi
Legumes_NevaR_IRR_lo
Legumes_NevaR_RFD_hi
Legumes_NevaR_RFD_lo
Legumes_NewCaledn_RFD_hi
Legumes_NewCaledn_RFD_lo
Legumes_NewZealand_RFD_hi
Legumes_NewZealand_RFD_lo
Legumes_NigerR_IRR_hi
Legumes_NigerR_IRR_lo
Legumes_NigerR_RFD_hi
Legumes_NigerR_RFD_lo
Legumes_NileR_IRR_hi
Legumes_NileR_IRR_lo
Legumes_NileR_RFD_hi
Legumes_NileR_RFD_lo
Legumes_NWTerr_RFD_hi
Legumes_NWTerr_RFD_lo
Legumes_ObR_IRR_hi
Legumes_ObR_IRR_lo
Legumes_ObR_RFD_hi
Legumes_ObR_RFD_lo
Legumes_OderR_RFD_hi
Legumes_OderR_RFD_lo
Legumes_OhioR_RFD_hi
Legumes_OhioR_RFD_lo
Legumes_OrangeR_IRR_hi
Legumes_OrangeR_IRR_lo
Legumes_OrangeR_RFD_hi
Legumes_OrangeR_RFD_lo
Legumes_OrinocoR_IRR_hi
Legumes_OrinocoR_IRR_lo
Legumes_OrinocoR_RFD_hi
Legumes_OrinocoR_RFD_lo
Legumes_Pampas_IRR_hi
Legumes_Pampas_IRR_lo
Legumes_Pampas_RFD_hi
Legumes_Pampas_RFD_lo
Legumes_Papaloapan_IRR_hi
Legumes_Papaloapan_IRR_lo
Legumes_Papaloapan_RFD_hi
Legumes_Papaloapan_RFD_lo
Legumes_PapuaCst_RFD_hi
Legumes_PapuaCst_RFD_lo
Legumes_ParnaibaR_IRR_hi
Legumes_ParnaibaR_IRR_lo
Legumes_ParnaibaR_RFD_hi
Legumes_ParnaibaR_RFD_lo
Legumes_PennarR_IRR_hi
Legumes_PennarR_IRR_lo
Legumes_PennarR_RFD_hi
Legumes_PennarR_RFD_lo
Legumes_PersianGulf_IRR_hi
Legumes_PersianGulf_IRR_lo
Legumes_PersianGulf_RFD_hi
Legumes_PersianGulf_RFD_lo
Legumes_PeruCst_IRR_hi
Legumes_PeruCst_IRR_lo

Legumes_PeruCst_RFD_hi
Legumes_PeruCst_RFD_lo
Legumes_Phlppns_RFD_hi
Legumes_Phlppns_RFD_lo
Legumes_PolandCst_IRR_hi
Legumes_PolandCst_IRR_lo
Legumes_PolandCst_RFD_hi
Legumes_PolandCst_RFD_lo
Legumes_PoR_RFD_hi
Legumes_PoR_RFD_lo
Legumes_RedSeaE_IRR_hi
Legumes_RedSeaE_IRR_lo
Legumes_RedSeaE_RFD_hi
Legumes_RedSeaE_RFD_lo
Legumes_RhineR_IRR_hi
Legumes_RhineR_IRR_lo
Legumes_RhineR_RFD_hi
Legumes_RhineR_RFD_lo
Legumes_RhoneR_IRR_hi
Legumes_RhoneR_IRR_lo
Legumes_RhoneR_RFD_hi
Legumes_RhoneR_RFD_lo
Legumes_RiftValley_IRR_hi
Legumes_RiftValley_IRR_lo
Legumes_RiftValley_RFD_hi
Legumes_RiftValley_RFD_lo
Legumes_RioBalsas_IRR_hi
Legumes_RioBalsas_IRR_lo
Legumes_RioBalsas_RFD_hi
Legumes_RioBalsas_RFD_lo
Legumes_RioGrande_IRR_hi
Legumes_RioGrande_IRR_lo
Legumes_RioGrande_RFD_hi
Legumes_RioGrande_RFD_lo
Legumes_RioLaPlata_IRR_hi
Legumes_RioLaPlata_IRR_lo
Legumes_RioLaPlata_RFD_hi
Legumes_RioLaPlata_RFD_lo
Legumes_RioLerma_IRR_hi
Legumes_RioLerma_IRR_lo
Legumes_RioLerma_RFD_hi
Legumes_RioLerma_RFD_lo
Legumes_RioVerde_IRR_hi
Legumes_RioVerde_IRR_lo
Legumes_RioVerde_RFD_hi
Legumes_RioVerde_RFD_lo
Legumes_RusCstSE_IRR_hi
Legumes_RusCstSE_IRR_lo
Legumes_RusCstSE_RFD_hi
Legumes_RusCstSE_RFD_lo
Legumes_SabarmatiR_IRR_hi
Legumes_SabarmatiR_IRR_lo
Legumes_SabarmatiR_RFD_hi
Legumes_SabarmatiR_RFD_lo
Legumes_Salinas_IRR_hi
Legumes_Salinas_IRR_lo
Legumes_Salinas_RFD_hi
Legumes_Salinas_RFD_lo
Legumes_Salween_IRR_hi
Legumes_Salween_IRR_lo
Legumes_Salween_RFD_hi
Legumes_Salween_RFD_lo
Legumes_SAmerCstN_IRR_hi
Legumes_SAmerCstN_IRR_lo
Legumes_SAmerCstN_RFD_hi
Legumes_SAmerCstN_RFD_lo
Legumes_SAmerCstNE_IRR_hi
Legumes_SAmerCstNE_IRR_lo
Legumes_SAmerCstNE_RFD_hi
Legumes_SAmerCstNE_RFD_lo
Legumes_SaoFrancR_IRR_hi
Legumes_SaoFrancR_IRR_lo
Legumes_SaoFrancR_RFD_hi
Legumes_SaoFrancR_RFD_lo
Legumes_ScheldtR_IRR_hi
Legumes_ScheldtR_IRR_lo
Legumes_ScheldtR_RFD_hi
Legumes_ScheldtR_RFD_lo
Legumes_SChinaSea_RFD_hi
Legumes_SChinaSea_RFD_lo
Legumes_ScndnvN_RFD_hi
Legumes_ScndnvN_RFD_lo
Legumes_Scotland_RFD_hi
Legumes_Scotland_RFD_lo
Legumes_SeineR_IRR_hi
Legumes_SeineR_IRR_lo
Legumes_SeineR_RFD_hi
Legumes_SeineR_RFD_lo
Legumes_SenegalR_RFD_hi
Legumes_SenegalR_RFD_lo
Legumes_SepikR_RFD_hi
Legumes_SepikR_RFD_lo
Legumes_ShebJubR_IRR_hi
Legumes_ShebJubR_IRR_lo
Legumes_ShebJubR_RFD_hi
Legumes_ShebJubR_RFD_lo

Legumes_SinaiP_IRR_hi
Legumes_SinaiP_IRR_lo
Legumes_SinaiP_RFD_hi
Legumes_SinaiP_RFD_lo
Legumes_SittaungR_IRR_hi
Legumes_SittaungR_IRR_lo
Legumes_SittaungR_RFD_hi
Legumes_SittaungR_RFD_lo
Legumes_SolomonIsl_RFD_hi
Legumes_SolomonIsl_RFD_lo
Legumes_SpainCstSE_IRR_hi
Legumes_SpainCstSE_IRR_lo
Legumes_SpainCstSE_RFD_hi
Legumes_SpainCstSE_RFD_lo
Legumes_SriLanka_RFD_hi
Legumes_SriLanka_RFD_lo
Legumes_StLwrncR_RFD_hi
Legumes_StLwrncR_RFD_lo
Legumes_Sulawesi_IRR_hi
Legumes_Sulawesi_IRR_lo
Legumes_Sulawesi_RFD_hi
Legumes_Sulawesi_RFD_lo
Legumes_Sumatra_IRR_hi
Legumes_Sumatra_IRR_lo
Legumes_Sumatra_RFD_hi
Legumes_Sumatra_RFD_lo
Legumes_Sweden_RFD_hi
Legumes_Sweden_RFD_lo
Legumes_SyrDaryaR_IRR_hi
Legumes_SyrDaryaR_IRR_lo
Legumes_SyrDaryaR_RFD_hi
Legumes_SyrDaryaR_RFD_lo
Legumes_TagusR_IRR_hi
Legumes_TagusR_IRR_lo
Legumes_TagusR_RFD_hi
Legumes_TagusR_RFD_lo
Legumes_Taiwan_IRR_hi
Legumes_Taiwan_IRR_lo
Legumes_Taiwan_RFD_hi
Legumes_Taiwan_RFD_lo
Legumes_TaptiR_IRR_hi
Legumes_TaptiR_IRR_lo
Legumes_TaptiR_RFD_hi
Legumes_TaptiR_RFD_lo
Legumes_Tarim_RFD_hi
Legumes_Tarim_RFD_lo
Legumes_Tasmania_RFD_hi
Legumes_Tasmania_RFD_lo
Legumes_Tehuantpc_IRR_hi
Legumes_Tehuantpc_IRR_lo
Legumes_Tehuantpc_RFD_hi
Legumes_Tehuantpc_RFD_lo
Legumes_TennR_RFD_hi
Legumes_TennR_RFD_lo
Legumes_TexasCst_IRR_hi
Legumes_TexasCst_IRR_lo
Legumes_TexasCst_RFD_hi
Legumes_TexasCst_RFD_lo
Legumes_ThaiGulf_RFD_hi
Legumes_ThaiGulf_RFD_lo
Legumes_TiberR_RFD_hi
Legumes_TiberR_RFD_lo
Legumes_TigrEuphR_IRR_hi
Legumes_TigrEuphR_IRR_lo
Legumes_TigrEuphR_RFD_hi
Legumes_TigrEuphR_RFD_lo
Legumes_TocantinsR_IRR_hi
Legumes_TocantinsR_IRR_lo
Legumes_TocantinsR_RFD_hi
Legumes_TocantinsR_RFD_lo
Legumes_UralR_IRR_hi
Legumes_UralR_IRR_lo
Legumes_UralR_RFD_hi
Legumes_UralR_RFD_lo
Legumes_UsaColoRN_IRR_hi
Legumes_UsaColoRN_IRR_lo
Legumes_UsaColoRN_RFD_hi
Legumes_UsaColoRN_RFD_lo
Legumes_UsaColoRS_IRR_hi
Legumes_UsaColoRS_IRR_lo
Legumes_UsaColoRS_RFD_hi
Legumes_UsaColoRS_RFD_lo
Legumes_UsaCstE_IRR_hi
Legumes_UsaCstE_IRR_lo
Legumes_UsaCstE_RFD_hi
Legumes_UsaCstE_RFD_lo
Legumes_UsaCstNE_RFD_hi
Legumes_UsaCstNE_RFD_lo
Legumes_UsaCstSE_RFD_hi
Legumes_UsaCstSE_RFD_lo
Legumes_UsaPacNW_IRR_hi
Legumes_UsaPacNW_IRR_lo
Legumes_UsaPacNW_RFD_hi
Legumes_UsaPacNW_RFD_lo
Legumes_VietnamCst_RFD_hi
Legumes_VietnamCst_RFD_lo

Legumes_VolgaR_IRR_hi
Legumes_VolgaR_IRR_lo
Legumes_VolgaR_RFD_hi
Legumes_VolgaR_RFD_lo
Legumes_VoltaR_RFD_hi
Legumes_VoltaR_RFD_lo
Legumes_WislaR_IRR_hi
Legumes_WislaR_IRR_lo
Legumes_WislaR_RFD_hi
Legumes_WislaR_RFD_lo
Legumes_XunJiang_RFD_hi
Legumes_XunJiang_RFD_lo
Legumes_Yangtze_RFD_hi
Legumes_Yangtze_RFD_lo
Legumes_YeniseiR_IRR_hi
Legumes_YeniseiR_IRR_lo
Legumes_YeniseiR_RFD_hi
Legumes_YeniseiR_RFD_lo
Legumes_YucatanP_IRR_hi
Legumes_YucatanP_IRR_lo
Legumes_YucatanP_RFD_hi
Legumes_YucatanP_RFD_lo
Legumes_ZambeziR_IRR_hi
Legumes_ZambeziR_IRR_lo
Legumes_ZambeziR_RFD_hi
Legumes_ZambeziR_RFD_lo
Legumes_ZiyaHe_RFD_hi
Legumes_ZiyaHe_RFD_lo
Liquids
MiscCrop_AdrBlkSea_IRR_hi
MiscCrop_AdrBlkSea_IRR_lo
MiscCrop_AdrBlkSea_RFD_hi
MiscCrop_AdrBlkSea_RFD_lo
MiscCrop_AfrCstE_IRR_hi
MiscCrop_AfrCstE_IRR_lo
MiscCrop_AfrCstE_RFD_hi
MiscCrop_AfrCstE_RFD_lo
MiscCrop_AfrCstNE_IRR_hi
MiscCrop_AfrCstNE_IRR_lo
MiscCrop_AfrCstNE_RFD_hi
MiscCrop_AfrCstNE_RFD_lo
MiscCrop_AfrCstNW_IRR_hi
MiscCrop_AfrCstNW_IRR_lo
MiscCrop_AfrCstNW_RFD_hi
MiscCrop_AfrCstNW_RFD_lo
MiscCrop_AfrCstS_IRR_hi
MiscCrop_AfrCstS_IRR_lo
MiscCrop_AfrCstS_RFD_hi
MiscCrop_AfrCstS_RFD_lo
MiscCrop_AfrCstSE_IRR_hi
MiscCrop_AfrCstSE_IRR_lo
MiscCrop_AfrCstSE_RFD_hi
MiscCrop_AfrCstSE_RFD_lo
MiscCrop_AfrCstSSW_IRR_hi
MiscCrop_AfrCstSSW_IRR_lo
MiscCrop_AfrCstSSW_RFD_hi
MiscCrop_AfrCstSSW_RFD_lo
MiscCrop_AfrCstW_IRR_hi
MiscCrop_AfrCstW_IRR_lo
MiscCrop_AfrCstW_RFD_hi
MiscCrop_AfrCstW_RFD_lo
MiscCrop_AfrIntN_IRR_hi
MiscCrop_AfrIntN_IRR_lo
MiscCrop_AfrIntN_RFD_hi
MiscCrop_AfrIntN_RFD_lo
MiscCrop_AfrIntS_IRR_hi
MiscCrop_AfrIntS_IRR_lo
MiscCrop_AfrIntS_RFD_hi
MiscCrop_AfrIntS_RFD_lo
MiscCrop_AmazonR_IRR_hi
MiscCrop_AmazonR_IRR_lo
MiscCrop_AmazonR_RFD_hi
MiscCrop_AmazonR_RFD_lo
MiscCrop_AmuDaryaR_IRR_hi
MiscCrop_AmuDaryaR_IRR_lo
MiscCrop_AmuDaryaR_RFD_hi
MiscCrop_AmuDaryaR_RFD_lo
MiscCrop_AmurR_IRR_hi
MiscCrop_AmurR_IRR_lo
MiscCrop_AmurR_RFD_hi
MiscCrop_AmurR_RFD_lo
MiscCrop_AngolaCst_IRR_hi
MiscCrop_AngolaCst_IRR_lo
MiscCrop_AngolaCst_RFD_hi
MiscCrop_AngolaCst_RFD_lo
MiscCrop_ArabianP_IRR_hi
MiscCrop_ArabianP_IRR_lo
MiscCrop_ArabianP_RFD_hi
MiscCrop_ArabianP_RFD_lo
MiscCrop_ArabianSea_IRR_hi
MiscCrop_ArabianSea_IRR_lo
MiscCrop_ArgColoR_IRR_hi
MiscCrop_ArgColoR_IRR_lo
MiscCrop_ArgColoR_RFD_hi
MiscCrop_ArgColoR_RFD_lo
MiscCrop_ArgCstN_IRR_hi

MiscCrop_ArgCstN_IRR_lo
MiscCrop_ArgCstN_RFD_hi
MiscCrop_ArgCstN_RFD_lo
MiscCrop_ArgCstS_IRR_hi
MiscCrop_ArgCstS_IRR_lo
MiscCrop_ArgCstS_RFD_hi
MiscCrop_ArgCstS_RFD_lo
MiscCrop_ArkWhtRedR_IRR_hi
MiscCrop_ArkWhtRedR_IRR_lo
MiscCrop_ArkWhtRedR_RFD_hi
MiscCrop_ArkWhtRedR_RFD_lo
MiscCrop_AusCstE_IRR_hi
MiscCrop_AusCstE_IRR_lo
MiscCrop_AusCstE_RFD_hi
MiscCrop_AusCstE_RFD_lo
MiscCrop_AusCstN_RFD_hi
MiscCrop_AusCstN_RFD_lo
MiscCrop_AusCstS_IRR_hi
MiscCrop_AusCstS_IRR_lo
MiscCrop_AusCstW_IRR_hi
MiscCrop_AusCstW_IRR_lo
MiscCrop_AusInt_IRR_hi
MiscCrop_AusInt_IRR_lo
MiscCrop_AusInt_RFD_hi
MiscCrop_AusInt_RFD_lo
MiscCrop_BalticSea_IRR_hi
MiscCrop_BalticSea_IRR_lo
MiscCrop_BalticSea_RFD_hi
MiscCrop_BalticSea_RFD_lo
MiscCrop_BengalBay_IRR_hi
MiscCrop_BengalBay_IRR_lo
MiscCrop_BengalBay_RFD_hi
MiscCrop_BengalBay_RFD_lo
MiscCrop_BengalW_IRR_hi
MiscCrop_BengalW_IRR_lo
MiscCrop_BengalW_RFD_hi
MiscCrop_BengalW_RFD_lo
MiscCrop_BlackSeaN_IRR_hi
MiscCrop_BlackSeaN_IRR_lo
MiscCrop_BlackSeaN_RFD_hi
MiscCrop_BlackSeaN_RFD_lo
MiscCrop_BlackSeaS_IRR_hi
MiscCrop_BlackSeaS_IRR_lo
MiscCrop_BlackSeaS_RFD_hi
MiscCrop_BlackSeaS_RFD_lo
MiscCrop_BoHai_IRR_hi
MiscCrop_BoHai_IRR_lo
MiscCrop_BoHai_RFD_hi
MiscCrop_BoHai_RFD_lo
MiscCrop_BorneoCstN_IRR_hi
MiscCrop_BorneoCstN_IRR_lo
MiscCrop_BorneoCstN_RFD_hi
MiscCrop_BorneoCstN_RFD_lo
MiscCrop_BrahmaniR_IRR_hi
MiscCrop_BrahmaniR_IRR_lo
MiscCrop_BrahmaniR_RFD_hi
MiscCrop_BrahmaniR_RFD_lo
MiscCrop_BrzCstE_IRR_hi
MiscCrop_BrzCstE_IRR_lo
MiscCrop_BrzCstE_RFD_hi
MiscCrop_BrzCstE_RFD_lo
MiscCrop_BrzCstN_IRR_hi
MiscCrop_BrzCstN_IRR_lo
MiscCrop_BrzCstN_RFD_hi
MiscCrop_BrzCstN_RFD_lo
MiscCrop_BrzCstS_IRR_hi
MiscCrop_BrzCstS_IRR_lo
MiscCrop_BrzCstS_RFD_hi
MiscCrop_BrzCstS_RFD_lo
MiscCrop_California_IRR_hi
MiscCrop_California_IRR_lo
MiscCrop_California_RFD_hi
MiscCrop_California_RFD_lo
MiscCrop_CanAtl_RFD_hi
MiscCrop_CanAtl_RFD_lo
MiscCrop_Caribbean_IRR_hi
MiscCrop_Caribbean_IRR_lo
MiscCrop_Caribbean_RFD_hi
MiscCrop_Caribbean_RFD_lo
MiscCrop_CaspianE_IRR_hi
MiscCrop_CaspianE_IRR_lo
MiscCrop_CaspianNE_IRR_hi
MiscCrop_CaspianNE_IRR_lo
MiscCrop_CaspianNE_RFD_hi
MiscCrop_CaspianNE_RFD_lo
MiscCrop_CaspianSW_IRR_hi
MiscCrop_CaspianSW_IRR_lo
MiscCrop_CaspianSW_RFD_hi
MiscCrop_CaspianSW_RFD_lo
MiscCrop_CauveryR_IRR_hi
MiscCrop_CauveryR_IRR_lo
MiscCrop_CauveryR_RFD_hi
MiscCrop_CauveryR_RFD_lo
MiscCrop_ChaoPhrR_IRR_hi
MiscCrop_ChaoPhrR_IRR_lo
MiscCrop_ChaoPhrR_RFD_hi

MiscCrop_ChaoPhrR_RFD_lo
MiscCrop_ChileCstN_IRR_hi
MiscCrop_ChileCstN_IRR_lo
MiscCrop_ChileCstS_IRR_hi
MiscCrop_ChileCstS_IRR_lo
MiscCrop_ChinaCst_IRR_hi
MiscCrop_ChinaCst_IRR_lo
MiscCrop_ChinaCst_RFD_hi
MiscCrop_ChinaCst_RFD_lo
MiscCrop_CntAmer_IRR_hi
MiscCrop_CntAmer_IRR_lo
MiscCrop_CntAmer_RFD_hi
MiscCrop_CntAmer_RFD_lo
MiscCrop_ColEcuaCst_IRR_hi
MiscCrop_ColEcuaCst_IRR_lo
MiscCrop_ColEcuaCst_RFD_hi
MiscCrop_ColEcuaCst_RFD_lo
MiscCrop_CongoR_IRR_hi
MiscCrop_CongoR_IRR_lo
MiscCrop_CongoR_RFD_hi
MiscCrop_CongoR_RFD_lo
MiscCrop_DanubeR_IRR_hi
MiscCrop_DanubeR_IRR_lo
MiscCrop_DanubeR_RFD_hi
MiscCrop_DanubeR_RFD_lo
MiscCrop_DaugavaR_IRR_hi
MiscCrop_DaugavaR_IRR_lo
MiscCrop_DaugavaR_RFD_hi
MiscCrop_DaugavaR_RFD_lo
MiscCrop_DeadSea_IRR_hi
MiscCrop_DeadSea_IRR_lo
MiscCrop_DnieperR_IRR_hi
MiscCrop_DnieperR_IRR_lo
MiscCrop_DnieperR_RFD_hi
MiscCrop_DnieperR_RFD_lo
MiscCrop_DniesterR_IRR_hi
MiscCrop_DniesterR_IRR_lo
MiscCrop_DniesterR_RFD_hi
MiscCrop_DniesterR_RFD_lo
MiscCrop_DnkGrmCst_IRR_hi
MiscCrop_DnkGrmCst_IRR_lo
MiscCrop_DnkGrmCst_RFD_hi
MiscCrop_DnkGrmCst_RFD_lo
MiscCrop_DonR_IRR_hi
MiscCrop_DonR_IRR_lo
MiscCrop_DonR_RFD_hi
MiscCrop_DonR_RFD_lo
MiscCrop_DouroR_IRR_hi
MiscCrop_DouroR_IRR_lo
MiscCrop_DouroR_RFD_hi
MiscCrop_DouroR_RFD_lo
MiscCrop_DvinaRN_IRR_hi
MiscCrop_DvinaRN_IRR_lo
MiscCrop_DvinaRN_RFD_hi
MiscCrop_DvinaRN_RFD_lo
MiscCrop_EbroR_IRR_hi
MiscCrop_EbroR_IRR_lo
MiscCrop_EbroR_RFD_hi
MiscCrop_EbroR_RFD_lo
MiscCrop_EJrdnSyr_IRR_hi
MiscCrop_EJrdnSyr_IRR_lo
MiscCrop_EJrdnSyr_RFD_hi
MiscCrop_EJrdnSyr_RFD_lo
MiscCrop_ElbeR_IRR_hi
MiscCrop_ElbeR_IRR_lo
MiscCrop_ElbeR_RFD_hi
MiscCrop_ElbeR_RFD_lo
MiscCrop_EmsWeserR_IRR_hi
MiscCrop_EmsWeserR_IRR_lo
MiscCrop_EmsWeserR_RFD_hi
MiscCrop_EmsWeserR_RFD_lo
MiscCrop_EngWales_IRR_hi
MiscCrop_EngWales_IRR_lo
MiscCrop_EngWales_RFD_hi
MiscCrop_EngWales_RFD_lo
MiscCrop_FarahrudR_IRR_hi
MiscCrop_FarahrudR_IRR_lo
MiscCrop_FlyR_RFD_hi
MiscCrop_FlyR_RFD_lo
MiscCrop_FranceCstS_IRR_hi
MiscCrop_FranceCstS_IRR_lo
MiscCrop_FranceCstS_RFD_hi
MiscCrop_FranceCstS_RFD_lo
MiscCrop_FranceCstW_IRR_hi
MiscCrop_FranceCstW_IRR_lo
MiscCrop_FranceCstW_RFD_hi
MiscCrop_FranceCstW_RFD_lo
MiscCrop_GangesR_IRR_hi
MiscCrop_GangesR_IRR_lo
MiscCrop_GangesR_RFD_hi
MiscCrop_GangesR_RFD_lo
MiscCrop_Gironde_IRR_hi
MiscCrop_Gironde_IRR_lo
MiscCrop_Gironde_RFD_hi
MiscCrop_Gironde_RFD_lo
MiscCrop_Gobi_IRR_hi

MiscCrop_Gobi_IRR_lo
MiscCrop_Gobi_RFD_hi
MiscCrop_Gobi_RFD_lo
MiscCrop_GodavariR_IRR_hi
MiscCrop_GodavariR_IRR_lo
MiscCrop_GodavariR_RFD_hi
MiscCrop_GodavariR_RFD_lo
MiscCrop_GreatBasin_IRR_hi
MiscCrop_GreatBasin_IRR_lo
MiscCrop_GreatBasin_RFD_hi
MiscCrop_GreatBasin_RFD_lo
MiscCrop_GreatLakes_IRR_hi
MiscCrop_GreatLakes_IRR_lo
MiscCrop_GreatLakes_RFD_hi
MiscCrop_GreatLakes_RFD_lo
MiscCrop_GrijUsuR_IRR_hi
MiscCrop_GrijUsuR_IRR_lo
MiscCrop_GrijUsuR_RFD_hi
MiscCrop_GrijUsuR_RFD_lo
MiscCrop_GuadalqR_IRR_hi
MiscCrop_GuadalqR_IRR_lo
MiscCrop_GuadalqR_RFD_hi
MiscCrop_GuadalqR_RFD_lo
MiscCrop_GuadianaR_IRR_hi
MiscCrop_GuadianaR_IRR_lo
MiscCrop_GuadianaR_RFD_hi
MiscCrop_GuadianaR_RFD_lo
MiscCrop_GuineaGulf_IRR_hi
MiscCrop_GuineaGulf_IRR_lo
MiscCrop_GuineaGulf_RFD_hi
MiscCrop_GuineaGulf_RFD_lo
MiscCrop_Hainan_IRR_hi
MiscCrop_Hainan_IRR_lo
MiscCrop_Hainan_RFD_hi
MiscCrop_Hainan_RFD_lo
MiscCrop_HamuMashR_IRR_hi
MiscCrop_HamuMashR_IRR_lo
MiscCrop_Helmand_IRR_hi
MiscCrop_Helmand_IRR_lo
MiscCrop_Hong_IRR_hi
MiscCrop_Hong_IRR_lo
MiscCrop_Hong_RFD_hi
MiscCrop_Hong_RFD_lo
MiscCrop_HuangHeR_IRR_hi
MiscCrop_HuangHeR_IRR_lo
MiscCrop_HuangHeR_RFD_hi
MiscCrop_HuangHeR_RFD_lo
MiscCrop_HudsonBay_RFD_hi
MiscCrop_HudsonBay_RFD_lo
MiscCrop_IberiaCst_IRR_hi
MiscCrop_IberiaCst_IRR_lo
MiscCrop_IberiaCst_RFD_hi
MiscCrop_IberiaCst_RFD_lo
MiscCrop_IdnE_IRR_hi
MiscCrop_IdnE_IRR_lo
MiscCrop_IdnE_RFD_hi
MiscCrop_IdnE_RFD_lo
MiscCrop_IndCstE_IRR_hi
MiscCrop_IndCstE_IRR_lo
MiscCrop_IndCstE_RFD_hi
MiscCrop_IndCstE_RFD_lo
MiscCrop_IndCstNE_IRR_hi
MiscCrop_IndCstNE_IRR_lo
MiscCrop_IndCstNE_RFD_hi
MiscCrop_IndCstNE_RFD_lo
MiscCrop_IndCstS_IRR_hi
MiscCrop_IndCstS_IRR_lo
MiscCrop_IndCstS_RFD_hi
MiscCrop_IndCstS_RFD_lo
MiscCrop_IndCstW_IRR_hi
MiscCrop_IndCstW_IRR_lo
MiscCrop_IndCstW_RFD_hi
MiscCrop_IndCstW_RFD_lo
MiscCrop_IndusR_IRR_hi
MiscCrop_IndusR_IRR_lo
MiscCrop_IndusR_RFD_hi
MiscCrop_IndusR_RFD_lo
MiscCrop_Iran_IRR_hi
MiscCrop_Iran_IRR_lo
MiscCrop_Ireland_IRR_hi
MiscCrop_Ireland_IRR_lo
MiscCrop_Ireland_RFD_hi
MiscCrop_Ireland_RFD_lo
MiscCrop_IrianJaya_IRR_hi
MiscCrop_IrianJaya_IRR_lo
MiscCrop_IrianJaya_RFD_hi
MiscCrop_IrianJaya_RFD_lo
MiscCrop_IrrawaddyR_IRR_hi
MiscCrop_IrrawaddyR_IRR_lo
MiscCrop_IrrawaddyR_RFD_hi
MiscCrop_IrrawaddyR_RFD_lo
MiscCrop_ItalyCstE_IRR_hi
MiscCrop_ItalyCstE_IRR_lo
MiscCrop_ItalyCstE_RFD_hi
MiscCrop_ItalyCstE_RFD_lo
MiscCrop_ItalyCstW_IRR_hi

MiscCrop_ItalyCstW_IRR_lo
MiscCrop_ItalyCstW_RFD_hi
MiscCrop_ItalyCstW_RFD_lo
MiscCrop_Japan_IRR_hi
MiscCrop_Japan_IRR_lo
MiscCrop_Japan_RFD_hi
MiscCrop_Japan_RFD_lo
MiscCrop_JavaTimor_IRR_hi
MiscCrop_JavaTimor_IRR_lo
MiscCrop_JavaTimor_RFD_hi
MiscCrop_JavaTimor_RFD_lo
MiscCrop_Kalimantan_IRR_hi
MiscCrop_Kalimantan_IRR_lo
MiscCrop_Kalimantan_RFD_hi
MiscCrop_Kalimantan_RFD_lo
MiscCrop_Korea_IRR_hi
MiscCrop_Korea_IRR_lo
MiscCrop_Korea_RFD_hi
MiscCrop_Korea_RFD_lo
MiscCrop_KrishnaR_IRR_hi
MiscCrop_KrishnaR_IRR_lo
MiscCrop_KrishnaR_RFD_hi
MiscCrop_KrishnaR_RFD_lo
MiscCrop_LaPuna_IRR_hi
MiscCrop_LaPuna_IRR_lo
MiscCrop_LaPuna_RFD_hi
MiscCrop_LaPuna_RFD_lo
MiscCrop_LBalkash_IRR_hi
MiscCrop_LBalkash_IRR_lo
MiscCrop_LBalkash_RFD_hi
MiscCrop_LBalkash_RFD_lo
MiscCrop_LChad_IRR_hi
MiscCrop_LChad_IRR_lo
MiscCrop_LChad_RFD_hi
MiscCrop_LChad_RFD_lo
MiscCrop_LenaR_IRR_hi
MiscCrop_LenaR_IRR_lo
MiscCrop_LenaR_RFD_hi
MiscCrop_LenaR_RFD_lo
MiscCrop_LimpopoR_IRR_hi
MiscCrop_LimpopoR_IRR_lo
MiscCrop_LimpopoR_RFD_hi
MiscCrop_LimpopoR_RFD_lo
MiscCrop_LoireR_IRR_hi
MiscCrop_LoireR_IRR_lo
MiscCrop_LoireR_RFD_hi
MiscCrop_LoireR_RFD_lo
MiscCrop_Mackenzie_RFD_hi
MiscCrop_Mackenzie_RFD_lo
MiscCrop_Madagascar_IRR_hi
MiscCrop_Madagascar_IRR_lo
MiscCrop_Madagascar_RFD_hi
MiscCrop_Madagascar_RFD_lo
MiscCrop_MagdalenaR_IRR_hi
MiscCrop_MagdalenaR_IRR_lo
MiscCrop_MagdalenaR_RFD_hi
MiscCrop_MagdalenaR_RFD_lo
MiscCrop_MahanadiR_IRR_hi
MiscCrop_MahanadiR_IRR_lo
MiscCrop_MahanadiR_RFD_hi
MiscCrop_MahanadiR_RFD_lo
MiscCrop_MahiR_IRR_hi
MiscCrop_MahiR_IRR_lo
MiscCrop_MahiR_RFD_hi
MiscCrop_MahiR_RFD_lo
MiscCrop_MalaysiaP_IRR_hi
MiscCrop_MalaysiaP_IRR_lo
MiscCrop_MalaysiaP_RFD_hi
MiscCrop_MalaysiaP_RFD_lo
MiscCrop_MarChiq_IRR_hi
MiscCrop_MarChiq_IRR_lo
MiscCrop_MarChiq_RFD_hi
MiscCrop_MarChiq_RFD_lo
MiscCrop_MeditE_IRR_hi
MiscCrop_MeditE_IRR_lo
MiscCrop_MeditE_RFD_hi
MiscCrop_MeditE_RFD_lo
MiscCrop_MeditIsl_IRR_hi
MiscCrop_MeditIsl_IRR_lo
MiscCrop_MeditIsl_RFD_hi
MiscCrop_MeditIsl_RFD_lo
MiscCrop_MeditS_IRR_hi
MiscCrop_MeditS_IRR_lo
MiscCrop_MeditS_RFD_hi
MiscCrop_MeditS_RFD_lo
MiscCrop_Mekong_IRR_hi
MiscCrop_Mekong_IRR_lo
MiscCrop_Mekong_RFD_hi
MiscCrop_Mekong_RFD_lo
MiscCrop_MexBaja_IRR_hi
MiscCrop_MexBaja_IRR_lo
MiscCrop_MexBaja_RFD_hi
MiscCrop_MexBaja_RFD_lo
MiscCrop_MexCstNW_IRR_hi
MiscCrop_MexCstNW_IRR_lo
MiscCrop_MexCstNW_RFD_hi

MiscCrop_MexCstNW_RFD_lo
MiscCrop_MexCstW_IRR_hi
MiscCrop_MexCstW_IRR_lo
MiscCrop_MexCstW_RFD_hi
MiscCrop_MexCstW_RFD_lo
MiscCrop_MexGulf_IRR_hi
MiscCrop_MexGulf_IRR_lo
MiscCrop_MexGulf_RFD_hi
MiscCrop_MexGulf_RFD_lo
MiscCrop_MexInt_IRR_hi
MiscCrop_MexInt_IRR_lo
MiscCrop_MexInt_RFD_hi
MiscCrop_MexInt_RFD_lo
MiscCrop_MissouriR_IRR_hi
MiscCrop_MissouriR_IRR_lo
MiscCrop_MissouriR_RFD_hi
MiscCrop_MissouriR_RFD_lo
MiscCrop_MissppRN_IRR_hi
MiscCrop_MissppRN_IRR_lo
MiscCrop_MissppRN_RFD_hi
MiscCrop_MissppRN_RFD_lo
MiscCrop_MissppRS_IRR_hi
MiscCrop_MissppRS_IRR_lo
MiscCrop_MissppRS_RFD_hi
MiscCrop_MissppRS_RFD_lo
MiscCrop_MurrayDrlg_IRR_hi
MiscCrop_MurrayDrlg_IRR_lo
MiscCrop_MurrayDrlg_RFD_hi
MiscCrop_MurrayDrlg_RFD_lo
MiscCrop_NarmadaR_IRR_hi
MiscCrop_NarmadaR_IRR_lo
MiscCrop_NarmadaR_RFD_hi
MiscCrop_NarmadaR_RFD_lo
MiscCrop_NarvaR_IRR_hi
MiscCrop_NarvaR_IRR_lo
MiscCrop_NarvaR_RFD_hi
MiscCrop_NarvaR_RFD_lo
MiscCrop_NegroR_IRR_hi
MiscCrop_NegroR_IRR_lo
MiscCrop_NegroR_RFD_hi
MiscCrop_NegroR_RFD_lo
MiscCrop_NelsonR_IRR_hi
MiscCrop_NelsonR_IRR_lo
MiscCrop_NelsonR_RFD_hi
MiscCrop_NelsonR_RFD_lo
MiscCrop_NemanR_IRR_hi
MiscCrop_NemanR_IRR_lo
MiscCrop_NemanR_RFD_hi
MiscCrop_NemanR_RFD_lo
MiscCrop_NevaR_IRR_hi
MiscCrop_NevaR_IRR_lo
MiscCrop_NevaR_RFD_hi
MiscCrop_NevaR_RFD_lo
MiscCrop_NewCaledn_RFD_hi
MiscCrop_NewCaledn_RFD_lo
MiscCrop_NewZealand_IRR_hi
MiscCrop_NewZealand_IRR_lo
MiscCrop_NewZealand_RFD_hi
MiscCrop_NewZealand_RFD_lo
MiscCrop_NigerR_IRR_hi
MiscCrop_NigerR_IRR_lo
MiscCrop_NigerR_RFD_hi
MiscCrop_NigerR_RFD_lo
MiscCrop_NileR_IRR_hi
MiscCrop_NileR_IRR_lo
MiscCrop_NileR_RFD_hi
MiscCrop_NileR_RFD_lo
MiscCrop_NWTerr_RFD_hi
MiscCrop_NWTerr_RFD_lo
MiscCrop_ObR_IRR_hi
MiscCrop_ObR_IRR_lo
MiscCrop_ObR_RFD_hi
MiscCrop_ObR_RFD_lo
MiscCrop_OderR_IRR_hi
MiscCrop_OderR_IRR_lo
MiscCrop_OderR_RFD_hi
MiscCrop_OderR_RFD_lo
MiscCrop_OhioR_IRR_hi
MiscCrop_OhioR_IRR_lo
MiscCrop_OhioR_RFD_hi
MiscCrop_OhioR_RFD_lo
MiscCrop_OrangeR_IRR_hi
MiscCrop_OrangeR_IRR_lo
MiscCrop_OrangeR_RFD_hi
MiscCrop_OrangeR_RFD_lo
MiscCrop_OrinocoR_IRR_hi
MiscCrop_OrinocoR_IRR_lo
MiscCrop_OrinocoR_RFD_hi
MiscCrop_OrinocoR_RFD_lo
MiscCrop_Pampas_IRR_hi
MiscCrop_Pampas_IRR_lo
MiscCrop_Pampas_RFD_hi
MiscCrop_Pampas_RFD_lo
MiscCrop_Papaloapan_IRR_hi
MiscCrop_Papaloapan_IRR_lo
MiscCrop_Papaloapan_RFD_hi

MiscCrop_Papaloapan_RFD_lo
MiscCrop_PapuaCst_RFD_hi
MiscCrop_PapuaCst_RFD_lo
MiscCrop_ParnaibaR_IRR_hi
MiscCrop_ParnaibaR_IRR_lo
MiscCrop_ParnaibaR_RFD_hi
MiscCrop_ParnaibaR_RFD_lo
MiscCrop_PennarR_IRR_hi
MiscCrop_PennarR_IRR_lo
MiscCrop_PennarR_RFD_hi
MiscCrop_PennarR_RFD_lo
MiscCrop_PersianGulf_IRR_hi
MiscCrop_PersianGulf_IRR_lo
MiscCrop_PeruCst_IRR_hi
MiscCrop_PeruCst_IRR_lo
MiscCrop_PeruCst_RFD_hi
MiscCrop_PeruCst_RFD_lo
MiscCrop_Phlppns_IRR_hi
MiscCrop_Phlppns_IRR_lo
MiscCrop_Phlppns_RFD_hi
MiscCrop_Phlppns_RFD_lo
MiscCrop_PolandCst_IRR_hi
MiscCrop_PolandCst_IRR_lo
MiscCrop_PolandCst_RFD_hi
MiscCrop_PolandCst_RFD_lo
MiscCrop_PoR_IRR_hi
MiscCrop_PoR_IRR_lo
MiscCrop_PoR_RFD_hi
MiscCrop_PoR_RFD_lo
MiscCrop_RedSeaE_IRR_hi
MiscCrop_RedSeaE_IRR_lo
MiscCrop_RedSeaE_RFD_hi
MiscCrop_RedSeaE_RFD_lo
MiscCrop_RhineR_IRR_hi
MiscCrop_RhineR_IRR_lo
MiscCrop_RhineR_RFD_hi
MiscCrop_RhineR_RFD_lo
MiscCrop_RhoneR_IRR_hi
MiscCrop_RhoneR_IRR_lo
MiscCrop_RhoneR_RFD_hi
MiscCrop_RhoneR_RFD_lo
MiscCrop_RiftValley_IRR_hi
MiscCrop_RiftValley_IRR_lo
MiscCrop_RiftValley_RFD_hi
MiscCrop_RiftValley_RFD_lo
MiscCrop_RioBalsas_IRR_hi
MiscCrop_RioBalsas_IRR_lo
MiscCrop_RioBalsas_RFD_hi
MiscCrop_RioBalsas_RFD_lo
MiscCrop_RioGrande_IRR_hi
MiscCrop_RioGrande_IRR_lo
MiscCrop_RioGrande_RFD_hi
MiscCrop_RioGrande_RFD_lo
MiscCrop_RioLaPlata_IRR_hi
MiscCrop_RioLaPlata_IRR_lo
MiscCrop_RioLaPlata_RFD_hi
MiscCrop_RioLaPlata_RFD_lo
MiscCrop_RioLerma_IRR_hi
MiscCrop_RioLerma_IRR_lo
MiscCrop_RioLerma_RFD_hi
MiscCrop_RioLerma_RFD_lo
MiscCrop_RioVerde_IRR_hi
MiscCrop_RioVerde_IRR_lo
MiscCrop_RioVerde_RFD_hi
MiscCrop_RioVerde_RFD_lo
MiscCrop_RusCstSE_IRR_hi
MiscCrop_RusCstSE_IRR_lo
MiscCrop_RusCstSE_RFD_hi
MiscCrop_RusCstSE_RFD_lo
MiscCrop_SabarmatiR_IRR_hi
MiscCrop_SabarmatiR_IRR_lo
MiscCrop_SabarmatiR_RFD_hi
MiscCrop_SabarmatiR_RFD_lo
MiscCrop_Salinas_IRR_hi
MiscCrop_Salinas_IRR_lo
MiscCrop_Salinas_RFD_hi
MiscCrop_Salinas_RFD_lo
MiscCrop_Salween_IRR_hi
MiscCrop_Salween_IRR_lo
MiscCrop_Salween_RFD_hi
MiscCrop_Salween_RFD_lo
MiscCrop_SAmerCstN_IRR_hi
MiscCrop_SAmerCstN_IRR_lo
MiscCrop_SAmerCstN_RFD_hi
MiscCrop_SAmerCstN_RFD_lo
MiscCrop_SAmerCstNE_IRR_hi
MiscCrop_SAmerCstNE_IRR_lo
MiscCrop_SAmerCstNE_RFD_hi
MiscCrop_SAmerCstNE_RFD_lo
MiscCrop_SaoFrancR_IRR_hi
MiscCrop_SaoFrancR_IRR_lo
MiscCrop_SaoFrancR_RFD_hi
MiscCrop_SaoFrancR_RFD_lo
MiscCrop_ScheldtR_IRR_hi
MiscCrop_ScheldtR_IRR_lo
MiscCrop_ScheldtR_RFD_hi

MiscCrop_ScheldtR_RFD_lo
MiscCrop_SChinaSea_IRR_hi
MiscCrop_SChinaSea_IRR_lo
MiscCrop_SChinaSea_RFD_hi
MiscCrop_SChinaSea_RFD_lo
MiscCrop_Scotland_IRR_hi
MiscCrop_Scotland_IRR_lo
MiscCrop_Scotland_RFD_hi
MiscCrop_Scotland_RFD_lo
MiscCrop_SeineR_IRR_hi
MiscCrop_SeineR_IRR_lo
MiscCrop_SeineR_RFD_hi
MiscCrop_SeineR_RFD_lo
MiscCrop_SenegalR_IRR_hi
MiscCrop_SenegalR_IRR_lo
MiscCrop_SenegalR_RFD_hi
MiscCrop_SenegalR_RFD_lo
MiscCrop_SepikR_RFD_hi
MiscCrop_SepikR_RFD_lo
MiscCrop_ShebJubR_IRR_hi
MiscCrop_ShebJubR_IRR_lo
MiscCrop_ShebJubR_RFD_hi
MiscCrop_ShebJubR_RFD_lo
MiscCrop_SinaiP_IRR_hi
MiscCrop_SinaiP_IRR_lo
MiscCrop_SittaungR_IRR_hi
MiscCrop_SittaungR_IRR_lo
MiscCrop_SittaungR_RFD_hi
MiscCrop_SittaungR_RFD_lo
MiscCrop_SolomonIsl_RFD_hi
MiscCrop_SolomonIsl_RFD_lo
MiscCrop_SpainCstSE_IRR_hi
MiscCrop_SpainCstSE_IRR_lo
MiscCrop_SpainCstSE_RFD_hi
MiscCrop_SpainCstSE_RFD_lo
MiscCrop_SriLanka_IRR_hi
MiscCrop_SriLanka_IRR_lo
MiscCrop_SriLanka_RFD_hi
MiscCrop_SriLanka_RFD_lo
MiscCrop_StLwrncR_RFD_hi
MiscCrop_StLwrncR_RFD_lo
MiscCrop_Sulawesi_IRR_hi
MiscCrop_Sulawesi_IRR_lo
MiscCrop_Sulawesi_RFD_hi
MiscCrop_Sulawesi_RFD_lo
MiscCrop_Sumatra_IRR_hi
MiscCrop_Sumatra_IRR_lo
MiscCrop_Sumatra_RFD_hi
MiscCrop_Sumatra_RFD_lo
MiscCrop_SyrDaryaR_IRR_hi
MiscCrop_SyrDaryaR_IRR_lo
MiscCrop_SyrDaryaR_RFD_hi
MiscCrop_SyrDaryaR_RFD_lo
MiscCrop_TagusR_IRR_hi
MiscCrop_TagusR_IRR_lo
MiscCrop_TagusR_RFD_hi
MiscCrop_TagusR_RFD_lo
MiscCrop_Taiwan_IRR_hi
MiscCrop_Taiwan_IRR_lo
MiscCrop_Taiwan_RFD_hi
MiscCrop_Taiwan_RFD_lo
MiscCrop_TaptiR_IRR_hi
MiscCrop_TaptiR_IRR_lo
MiscCrop_TaptiR_RFD_hi
MiscCrop_TaptiR_RFD_lo
MiscCrop_Tarim_IRR_hi
MiscCrop_Tarim_IRR_lo
MiscCrop_Tarim_RFD_hi
MiscCrop_Tarim_RFD_lo
MiscCrop_Tasmania_IRR_hi
MiscCrop_Tasmania_IRR_lo
MiscCrop_Tasmania_RFD_hi
MiscCrop_Tasmania_RFD_lo
MiscCrop_Tehuantpc_IRR_hi
MiscCrop_Tehuantpc_IRR_lo
MiscCrop_Tehuantpc_RFD_hi
MiscCrop_Tehuantpc_RFD_lo
MiscCrop_TennR_IRR_hi
MiscCrop_TennR_IRR_lo
MiscCrop_TennR_RFD_hi
MiscCrop_TennR_RFD_lo
MiscCrop_ThaiGulf_IRR_hi
MiscCrop_ThaiGulf_IRR_lo
MiscCrop_ThaiGulf_RFD_hi
MiscCrop_ThaiGulf_RFD_lo
MiscCrop_TiberR_IRR_hi
MiscCrop_TiberR_IRR_lo
MiscCrop_TiberR_RFD_hi
MiscCrop_TiberR_RFD_lo
MiscCrop_TigrEuphR_IRR_hi
MiscCrop_TigrEuphR_IRR_lo
MiscCrop_TigrEuphR_RFD_hi
MiscCrop_TigrEuphR_RFD_lo
MiscCrop_TocantinsR_IRR_hi
MiscCrop_TocantinsR_IRR_lo
MiscCrop_TocantinsR_RFD_hi

MiscCrop_TocantinsR_RFD_lo
MiscCrop_UralR_IRR_hi
MiscCrop_UralR_IRR_lo
MiscCrop_UralR_RFD_hi
MiscCrop_UralR_RFD_lo
MiscCrop_UsaColoRS_IRR_hi
MiscCrop_UsaColoRS_IRR_lo
MiscCrop_UsaColoRS_RFD_hi
MiscCrop_UsaColoRS_RFD_lo
MiscCrop_UsaCstE_IRR_hi
MiscCrop_UsaCstE_IRR_lo
MiscCrop_UsaCstE_RFD_hi
MiscCrop_UsaCstE_RFD_lo
MiscCrop_UsaCstNE_IRR_hi
MiscCrop_UsaCstNE_IRR_lo
MiscCrop_UsaCstNE_RFD_hi
MiscCrop_UsaCstNE_RFD_lo
MiscCrop_UsaCstSE_IRR_hi
MiscCrop_UsaCstSE_IRR_lo
MiscCrop_UsaCstSE_RFD_hi
MiscCrop_UsaCstSE_RFD_lo
MiscCrop_UsaPacNW_IRR_hi
MiscCrop_UsaPacNW_IRR_lo
MiscCrop_UsaPacNW_RFD_hi
MiscCrop_UsaPacNW_RFD_lo
MiscCrop_VietnamCst_IRR_hi
MiscCrop_VietnamCst_IRR_lo
MiscCrop_VietnamCst_RFD_hi
MiscCrop_VietnamCst_RFD_lo
MiscCrop_VolgaR_IRR_hi
MiscCrop_VolgaR_IRR_lo
MiscCrop_VolgaR_RFD_hi
MiscCrop_VolgaR_RFD_lo
MiscCrop_VoltaR_IRR_hi
MiscCrop_VoltaR_IRR_lo
MiscCrop_VoltaR_RFD_hi
MiscCrop_VoltaR_RFD_lo
MiscCrop_WislaR_IRR_hi
MiscCrop_WislaR_IRR_lo
MiscCrop_WislaR_RFD_hi
MiscCrop_WislaR_RFD_lo
MiscCrop_XunJiang_IRR_hi
MiscCrop_XunJiang_IRR_lo
MiscCrop_XunJiang_RFD_hi
MiscCrop_XunJiang_RFD_lo
MiscCrop_Yangtze_IRR_hi
MiscCrop_Yangtze_IRR_lo
MiscCrop_Yangtze_RFD_hi
MiscCrop_Yangtze_RFD_lo
MiscCrop_YeniseiR_IRR_hi
MiscCrop_YeniseiR_IRR_lo
MiscCrop_YeniseiR_RFD_hi
MiscCrop_YeniseiR_RFD_lo
MiscCrop_YucatanP_IRR_hi
MiscCrop_YucatanP_IRR_lo
MiscCrop_YucatanP_RFD_hi
MiscCrop_YucatanP_RFD_lo
MiscCrop_ZambeziR_IRR_hi
MiscCrop_ZambeziR_IRR_lo
MiscCrop_ZambeziR_RFD_hi
MiscCrop_ZambeziR_RFD_lo
MiscCrop_ZiyaHe_IRR_hi
MiscCrop_ZiyaHe_IRR_lo
MiscCrop_ZiyaHe_RFD_hi
MiscCrop_ZiyaHe_RFD_lo
MiscCropTree_AdrBlkSea_IRR_hi
MiscCropTree_AdrBlkSea_IRR_lo
MiscCropTree_AdrBlkSea_RFD_hi
MiscCropTree_AdrBlkSea_RFD_lo
MiscCropTree_AfrCstE_IRR_hi
MiscCropTree_AfrCstE_IRR_lo
MiscCropTree_AfrCstE_RFD_hi
MiscCropTree_AfrCstE_RFD_lo
MiscCropTree_AfrCstNE_IRR_hi
MiscCropTree_AfrCstNE_IRR_lo
MiscCropTree_AfrCstNE_RFD_hi
MiscCropTree_AfrCstNE_RFD_lo
MiscCropTree_AfrCstNW_IRR_hi
MiscCropTree_AfrCstNW_IRR_lo
MiscCropTree_AfrCstNW_RFD_hi
MiscCropTree_AfrCstNW_RFD_lo
MiscCropTree_AfrCstS_RFD_hi
MiscCropTree_AfrCstS_RFD_lo
MiscCropTree_AfrCstSE_IRR_hi
MiscCropTree_AfrCstSE_IRR_lo
MiscCropTree_AfrCstSE_RFD_hi
MiscCropTree_AfrCstSE_RFD_lo
MiscCropTree_AfrCstW_IRR_hi
MiscCropTree_AfrCstW_IRR_lo
MiscCropTree_AfrCstW_RFD_hi
MiscCropTree_AfrCstW_RFD_lo
MiscCropTree_AfrIntN_IRR_hi
MiscCropTree_AfrIntN_IRR_lo
MiscCropTree_AfrIntN_RFD_hi
MiscCropTree_AfrIntN_RFD_lo
MiscCropTree_AfrIntS_RFD_hi

MiscCropTree_AfrIntS_RFD_lo
MiscCropTree_AmazonR_IRR_hi
MiscCropTree_AmazonR_IRR_lo
MiscCropTree_AmazonR_RFD_hi
MiscCropTree_AmazonR_RFD_lo
MiscCropTree_AmurR_IRR_hi
MiscCropTree_AmurR_IRR_lo
MiscCropTree_AmurR_RFD_hi
MiscCropTree_AmurR_RFD_lo
MiscCropTree_AngolaCst_RFD_hi
MiscCropTree_AngolaCst_RFD_lo
MiscCropTree_ArabianP_IRR_hi
MiscCropTree_ArabianP_IRR_lo
MiscCropTree_ArabianP_RFD_hi
MiscCropTree_ArabianP_RFD_lo
MiscCropTree_ArkWhtRedR_RFD_hi
MiscCropTree_ArkWhtRedR_RFD_lo
MiscCropTree_BengalBay_RFD_hi
MiscCropTree_BengalBay_RFD_lo
MiscCropTree_BengalW_IRR_hi
MiscCropTree_BengalW_IRR_lo
MiscCropTree_BengalW_RFD_hi
MiscCropTree_BengalW_RFD_lo
MiscCropTree_BlackSeaN_RFD_hi
MiscCropTree_BlackSeaN_RFD_lo
MiscCropTree_BlackSeaS_IRR_hi
MiscCropTree_BlackSeaS_IRR_lo
MiscCropTree_BlackSeaS_RFD_hi
MiscCropTree_BlackSeaS_RFD_lo
MiscCropTree_BoHai_IRR_hi
MiscCropTree_BoHai_IRR_lo
MiscCropTree_BoHai_RFD_hi
MiscCropTree_BoHai_RFD_lo
MiscCropTree_BorneoCstN_RFD_hi
MiscCropTree_BorneoCstN_RFD_lo
MiscCropTree_BrahmaniR_IRR_hi
MiscCropTree_BrahmaniR_IRR_lo
MiscCropTree_BrahmaniR_RFD_hi
MiscCropTree_BrahmaniR_RFD_lo
MiscCropTree_BrzCstE_IRR_hi
MiscCropTree_BrzCstE_IRR_lo
MiscCropTree_BrzCstE_RFD_hi
MiscCropTree_BrzCstE_RFD_lo
MiscCropTree_BrzCstN_RFD_hi
MiscCropTree_BrzCstN_RFD_lo
MiscCropTree_BrzCstS_IRR_hi
MiscCropTree_BrzCstS_IRR_lo
MiscCropTree_BrzCstS_RFD_hi
MiscCropTree_BrzCstS_RFD_lo
MiscCropTree_California_RFD_hi
MiscCropTree_California_RFD_lo
MiscCropTree_Caribbean_IRR_hi
MiscCropTree_Caribbean_IRR_lo
MiscCropTree_Caribbean_RFD_hi
MiscCropTree_Caribbean_RFD_lo
MiscCropTree_CaspianSW_IRR_hi
MiscCropTree_CaspianSW_IRR_lo
MiscCropTree_CaspianSW_RFD_hi
MiscCropTree_CaspianSW_RFD_lo
MiscCropTree_CauveryR_IRR_hi
MiscCropTree_CauveryR_IRR_lo
MiscCropTree_CauveryR_RFD_hi
MiscCropTree_CauveryR_RFD_lo
MiscCropTree_ChaoPhrR_RFD_hi
MiscCropTree_ChaoPhrR_RFD_lo
MiscCropTree_ChinaCst_IRR_hi
MiscCropTree_ChinaCst_IRR_lo
MiscCropTree_ChinaCst_RFD_hi
MiscCropTree_ChinaCst_RFD_lo
MiscCropTree_CntAmer_IRR_hi
MiscCropTree_CntAmer_IRR_lo
MiscCropTree_CntAmer_RFD_hi
MiscCropTree_CntAmer_RFD_lo
MiscCropTree_ColEcuaCst_RFD_hi
MiscCropTree_ColEcuaCst_RFD_lo
MiscCropTree_CongoR_IRR_hi
MiscCropTree_CongoR_IRR_lo
MiscCropTree_CongoR_RFD_hi
MiscCropTree_CongoR_RFD_lo
MiscCropTree_DanubeR_IRR_hi
MiscCropTree_DanubeR_IRR_lo
MiscCropTree_DanubeR_RFD_hi
MiscCropTree_DanubeR_RFD_lo
MiscCropTree_DeadSea_IRR_hi
MiscCropTree_DeadSea_IRR_lo
MiscCropTree_DeadSea_RFD_hi
MiscCropTree_DeadSea_RFD_lo
MiscCropTree_DnieperR_RFD_hi
MiscCropTree_DnieperR_RFD_lo
MiscCropTree_DniesterR_RFD_hi
MiscCropTree_DniesterR_RFD_lo
MiscCropTree_DonR_RFD_hi
MiscCropTree_DonR_RFD_lo
MiscCropTree_DouroR_IRR_hi
MiscCropTree_DouroR_IRR_lo
MiscCropTree_DouroR_RFD_hi

MiscCropTree_DouroR_RFD_lo
MiscCropTree_EbroR_IRR_hi
MiscCropTree_EbroR_IRR_lo
MiscCropTree_EbroR_RFD_hi
MiscCropTree_EbroR_RFD_lo
MiscCropTree_EJrdnSyr_IRR_hi
MiscCropTree_EJrdnSyr_IRR_lo
MiscCropTree_EJrdnSyr_RFD_hi
MiscCropTree_EJrdnSyr_RFD_lo
MiscCropTree_FlyR_RFD_hi
MiscCropTree_FlyR_RFD_lo
MiscCropTree_FranceCstS_IRR_hi
MiscCropTree_FranceCstS_IRR_lo
MiscCropTree_FranceCstS_RFD_hi
MiscCropTree_FranceCstS_RFD_lo
MiscCropTree_GangesR_IRR_hi
MiscCropTree_GangesR_IRR_lo
MiscCropTree_GangesR_RFD_hi
MiscCropTree_GangesR_RFD_lo
MiscCropTree_Gobi_IRR_hi
MiscCropTree_Gobi_IRR_lo
MiscCropTree_Gobi_RFD_hi
MiscCropTree_Gobi_RFD_lo
MiscCropTree_GodavariR_IRR_hi
MiscCropTree_GodavariR_IRR_lo
MiscCropTree_GodavariR_RFD_hi
MiscCropTree_GodavariR_RFD_lo
MiscCropTree_GreatBasin_RFD_hi
MiscCropTree_GreatBasin_RFD_lo
MiscCropTree_GreatLakes_RFD_hi
MiscCropTree_GreatLakes_RFD_lo
MiscCropTree_GrijUsuR_IRR_hi
MiscCropTree_GrijUsuR_IRR_lo
MiscCropTree_GrijUsuR_RFD_hi
MiscCropTree_GrijUsuR_RFD_lo
MiscCropTree_GuadalqR_IRR_hi
MiscCropTree_GuadalqR_IRR_lo
MiscCropTree_GuadalqR_RFD_hi
MiscCropTree_GuadalqR_RFD_lo
MiscCropTree_GuadianaR_IRR_hi
MiscCropTree_GuadianaR_IRR_lo
MiscCropTree_GuadianaR_RFD_hi
MiscCropTree_GuadianaR_RFD_lo
MiscCropTree_GuineaGulf_IRR_hi
MiscCropTree_GuineaGulf_IRR_lo
MiscCropTree_GuineaGulf_RFD_hi
MiscCropTree_GuineaGulf_RFD_lo
MiscCropTree_Hainan_IRR_hi
MiscCropTree_Hainan_IRR_lo
MiscCropTree_Hainan_RFD_hi
MiscCropTree_Hainan_RFD_lo
MiscCropTree_Hong_IRR_hi
MiscCropTree_Hong_IRR_lo
MiscCropTree_Hong_RFD_hi
MiscCropTree_Hong_RFD_lo
MiscCropTree_HuangHeR_IRR_hi
MiscCropTree_HuangHeR_IRR_lo
MiscCropTree_HuangHeR_RFD_hi
MiscCropTree_HuangHeR_RFD_lo
MiscCropTree_IberiaCst_IRR_hi
MiscCropTree_IberiaCst_IRR_lo
MiscCropTree_IberiaCst_RFD_hi
MiscCropTree_IberiaCst_RFD_lo
MiscCropTree_IdnE_RFD_hi
MiscCropTree_IdnE_RFD_lo
MiscCropTree_IndCstE_IRR_hi
MiscCropTree_IndCstE_IRR_lo
MiscCropTree_IndCstE_RFD_hi
MiscCropTree_IndCstE_RFD_lo
MiscCropTree_IndCstNE_IRR_hi
MiscCropTree_IndCstNE_IRR_lo
MiscCropTree_IndCstNE_RFD_hi
MiscCropTree_IndCstNE_RFD_lo
MiscCropTree_IndCstS_IRR_hi
MiscCropTree_IndCstS_IRR_lo
MiscCropTree_IndCstS_RFD_hi
MiscCropTree_IndCstS_RFD_lo
MiscCropTree_IndCstW_IRR_hi
MiscCropTree_IndCstW_IRR_lo
MiscCropTree_IndCstW_RFD_hi
MiscCropTree_IndCstW_RFD_lo
MiscCropTree_IndusR_IRR_hi
MiscCropTree_IndusR_IRR_lo
MiscCropTree_IndusR_RFD_hi
MiscCropTree_IndusR_RFD_lo
MiscCropTree_IrianJaya_RFD_hi
MiscCropTree_IrianJaya_RFD_lo
MiscCropTree_IrrawaddyR_IRR_hi
MiscCropTree_IrrawaddyR_IRR_lo
MiscCropTree_IrrawaddyR_RFD_hi
MiscCropTree_IrrawaddyR_RFD_lo
MiscCropTree_ItalyCstE_IRR_hi
MiscCropTree_ItalyCstE_IRR_lo
MiscCropTree_ItalyCstE_RFD_hi
MiscCropTree_ItalyCstE_RFD_lo
MiscCropTree_ItalyCstW_IRR_hi

MiscCropTree_ItalyCstW_IRR_lo
MiscCropTree_ItalyCstW_RFD_hi
MiscCropTree_ItalyCstW_RFD_lo
MiscCropTree_JavaTimor_RFD_hi
MiscCropTree_JavaTimor_RFD_lo
MiscCropTree_Kalimantan_RFD_hi
MiscCropTree_Kalimantan_RFD_lo
MiscCropTree_KrishnaR_IRR_hi
MiscCropTree_KrishnaR_IRR_lo
MiscCropTree_KrishnaR_RFD_hi
MiscCropTree_KrishnaR_RFD_lo
MiscCropTree_LaPuna_RFD_hi
MiscCropTree_LaPuna_RFD_lo
MiscCropTree_LBalkash_IRR_hi
MiscCropTree_LBalkash_IRR_lo
MiscCropTree_LBalkash_RFD_hi
MiscCropTree_LBalkash_RFD_lo
MiscCropTree_LChad_RFD_hi
MiscCropTree_LChad_RFD_lo
MiscCropTree_LimpopoR_IRR_hi
MiscCropTree_LimpopoR_IRR_lo
MiscCropTree_LimpopoR_RFD_hi
MiscCropTree_LimpopoR_RFD_lo
MiscCropTree_Madagascar_RFD_hi
MiscCropTree_Madagascar_RFD_lo
MiscCropTree_MagdalenaR_RFD_hi
MiscCropTree_MagdalenaR_RFD_lo
MiscCropTree_MahanadiR_IRR_hi
MiscCropTree_MahanadiR_IRR_lo
MiscCropTree_MahanadiR_RFD_hi
MiscCropTree_MahanadiR_RFD_lo
MiscCropTree_MahiR_IRR_hi
MiscCropTree_MahiR_IRR_lo
MiscCropTree_MahiR_RFD_hi
MiscCropTree_MahiR_RFD_lo
MiscCropTree_MalaysiaP_RFD_hi
MiscCropTree_MalaysiaP_RFD_lo
MiscCropTree_MeditE_IRR_hi
MiscCropTree_MeditE_IRR_lo
MiscCropTree_MeditE_RFD_hi
MiscCropTree_MeditE_RFD_lo
MiscCropTree_MeditIsl_IRR_hi
MiscCropTree_MeditIsl_IRR_lo
MiscCropTree_MeditIsl_RFD_hi
MiscCropTree_MeditIsl_RFD_lo
MiscCropTree_MeditS_IRR_hi
MiscCropTree_MeditS_IRR_lo
MiscCropTree_MeditS_RFD_hi
MiscCropTree_MeditS_RFD_lo
MiscCropTree_Mekong_IRR_hi
MiscCropTree_Mekong_IRR_lo
MiscCropTree_Mekong_RFD_hi
MiscCropTree_Mekong_RFD_lo
MiscCropTree_MexCstNW_IRR_hi
MiscCropTree_MexCstNW_IRR_lo
MiscCropTree_MexCstNW_RFD_hi
MiscCropTree_MexCstNW_RFD_lo
MiscCropTree_MexCstW_RFD_hi
MiscCropTree_MexCstW_RFD_lo
MiscCropTree_MexGulf_IRR_hi
MiscCropTree_MexGulf_IRR_lo
MiscCropTree_MexGulf_RFD_hi
MiscCropTree_MexGulf_RFD_lo
MiscCropTree_MexInt_RFD_hi
MiscCropTree_MexInt_RFD_lo
MiscCropTree_MissouriR_RFD_hi
MiscCropTree_MissouriR_RFD_lo
MiscCropTree_MissppRN_RFD_hi
MiscCropTree_MissppRN_RFD_lo
MiscCropTree_MissppRS_RFD_hi
MiscCropTree_MissppRS_RFD_lo
MiscCropTree_NarmadaR_IRR_hi
MiscCropTree_NarmadaR_IRR_lo
MiscCropTree_NarmadaR_RFD_hi
MiscCropTree_NarmadaR_RFD_lo
MiscCropTree_NelsonR_RFD_hi
MiscCropTree_NelsonR_RFD_lo
MiscCropTree_NewCaledn_RFD_hi
MiscCropTree_NewCaledn_RFD_lo
MiscCropTree_NigerR_IRR_hi
MiscCropTree_NigerR_IRR_lo
MiscCropTree_NigerR_RFD_hi
MiscCropTree_NigerR_RFD_lo
MiscCropTree_NileR_IRR_hi
MiscCropTree_NileR_IRR_lo
MiscCropTree_NileR_RFD_hi
MiscCropTree_NileR_RFD_lo
MiscCropTree_ObR_IRR_hi
MiscCropTree_ObR_IRR_lo
MiscCropTree_ObR_RFD_hi
MiscCropTree_ObR_RFD_lo
MiscCropTree_OhioR_RFD_hi
MiscCropTree_OhioR_RFD_lo
MiscCropTree_OrinocoR_IRR_hi
MiscCropTree_OrinocoR_IRR_lo
MiscCropTree_OrinocoR_RFD_hi

MiscCropTree_OrinocoR_RFD_lo
MiscCropTree_Papaloapan_IRR_hi
MiscCropTree_Papaloapan_IRR_lo
MiscCropTree_Papaloapan_RFD_hi
MiscCropTree_Papaloapan_RFD_lo
MiscCropTree_PapuaCst_RFD_hi
MiscCropTree_PapuaCst_RFD_lo
MiscCropTree_ParnaibaR_IRR_hi
MiscCropTree_ParnaibaR_IRR_lo
MiscCropTree_ParnaibaR_RFD_hi
MiscCropTree_ParnaibaR_RFD_lo
MiscCropTree_PennarR_IRR_hi
MiscCropTree_PennarR_IRR_lo
MiscCropTree_PennarR_RFD_hi
MiscCropTree_PennarR_RFD_lo
MiscCropTree_PeruCst_RFD_hi
MiscCropTree_PeruCst_RFD_lo
MiscCropTree_Phlppns_RFD_hi
MiscCropTree_Phlppns_RFD_lo
MiscCropTree_PoR_IRR_hi
MiscCropTree_PoR_IRR_lo
MiscCropTree_PoR_RFD_hi
MiscCropTree_PoR_RFD_lo
MiscCropTree_RedSeaE_IRR_hi
MiscCropTree_RedSeaE_IRR_lo
MiscCropTree_RedSeaE_RFD_hi
MiscCropTree_RedSeaE_RFD_lo
MiscCropTree_RhoneR_RFD_hi
MiscCropTree_RhoneR_RFD_lo
MiscCropTree_RiftValley_IRR_hi
MiscCropTree_RiftValley_IRR_lo
MiscCropTree_RiftValley_RFD_hi
MiscCropTree_RiftValley_RFD_lo
MiscCropTree_RioBalsas_IRR_hi
MiscCropTree_RioBalsas_IRR_lo
MiscCropTree_RioBalsas_RFD_hi
MiscCropTree_RioBalsas_RFD_lo
MiscCropTree_RioGrande_RFD_hi
MiscCropTree_RioGrande_RFD_lo
MiscCropTree_RioLaPlata_IRR_hi
MiscCropTree_RioLaPlata_IRR_lo
MiscCropTree_RioLaPlata_RFD_hi
MiscCropTree_RioLaPlata_RFD_lo
MiscCropTree_RioLerma_IRR_hi
MiscCropTree_RioLerma_IRR_lo
MiscCropTree_RioLerma_RFD_hi
MiscCropTree_RioLerma_RFD_lo
MiscCropTree_RioVerde_IRR_hi
MiscCropTree_RioVerde_IRR_lo
MiscCropTree_RioVerde_RFD_hi
MiscCropTree_RioVerde_RFD_lo
MiscCropTree_RusCstSE_IRR_hi
MiscCropTree_RusCstSE_IRR_lo
MiscCropTree_RusCstSE_RFD_hi
MiscCropTree_RusCstSE_RFD_lo
MiscCropTree_SabarmatiR_IRR_hi
MiscCropTree_SabarmatiR_IRR_lo
MiscCropTree_SabarmatiR_RFD_hi
MiscCropTree_SabarmatiR_RFD_lo
MiscCropTree_Salween_IRR_hi
MiscCropTree_Salween_IRR_lo
MiscCropTree_Salween_RFD_hi
MiscCropTree_Salween_RFD_lo
MiscCropTree_SAmerCstN_IRR_hi
MiscCropTree_SAmerCstN_IRR_lo
MiscCropTree_SAmerCstN_RFD_hi
MiscCropTree_SAmerCstN_RFD_lo
MiscCropTree_SAmerCstNE_IRR_hi
MiscCropTree_SAmerCstNE_IRR_lo
MiscCropTree_SAmerCstNE_RFD_hi
MiscCropTree_SAmerCstNE_RFD_lo
MiscCropTree_SaoFrancR_IRR_hi
MiscCropTree_SaoFrancR_IRR_lo
MiscCropTree_SaoFrancR_RFD_hi
MiscCropTree_SaoFrancR_RFD_lo
MiscCropTree_SChinaSea_IRR_hi
MiscCropTree_SChinaSea_IRR_lo
MiscCropTree_SChinaSea_RFD_hi
MiscCropTree_SChinaSea_RFD_lo
MiscCropTree_SenegalR_RFD_hi
MiscCropTree_SenegalR_RFD_lo
MiscCropTree_SepikR_RFD_hi
MiscCropTree_SepikR_RFD_lo
MiscCropTree_ShebJubR_IRR_hi
MiscCropTree_ShebJubR_IRR_lo
MiscCropTree_ShebJubR_RFD_hi
MiscCropTree_ShebJubR_RFD_lo
MiscCropTree_SittaungR_RFD_hi
MiscCropTree_SittaungR_RFD_lo
MiscCropTree_SolomonIsl_RFD_hi
MiscCropTree_SolomonIsl_RFD_lo
MiscCropTree_SpainCstSE_IRR_hi
MiscCropTree_SpainCstSE_IRR_lo
MiscCropTree_SpainCstSE_RFD_hi
MiscCropTree_SpainCstSE_RFD_lo
MiscCropTree_SriLanka_RFD_hi

MiscCropTree_SriLanka_RFD_lo
MiscCropTree_Sulawesi_RFD_hi
MiscCropTree_Sulawesi_RFD_lo
MiscCropTree_Sumatra_RFD_hi
MiscCropTree_Sumatra_RFD_lo
MiscCropTree_TagusR_IRR_hi
MiscCropTree_TagusR_IRR_lo
MiscCropTree_TagusR_RFD_hi
MiscCropTree_TagusR_RFD_lo
MiscCropTree_TaptiR_IRR_hi
MiscCropTree_TaptiR_IRR_lo
MiscCropTree_TaptiR_RFD_hi
MiscCropTree_TaptiR_RFD_lo
MiscCropTree_Tarim_IRR_hi
MiscCropTree_Tarim_IRR_lo
MiscCropTree_Tarim_RFD_hi
MiscCropTree_Tarim_RFD_lo
MiscCropTree_Tehuantpc_IRR_hi
MiscCropTree_Tehuantpc_IRR_lo
MiscCropTree_Tehuantpc_RFD_hi
MiscCropTree_Tehuantpc_RFD_lo
MiscCropTree_TennR_RFD_hi
MiscCropTree_TennR_RFD_lo
MiscCropTree_TexasCst_RFD_hi
MiscCropTree_TexasCst_RFD_lo
MiscCropTree_ThaiGulf_RFD_hi
MiscCropTree_ThaiGulf_RFD_lo
MiscCropTree_TiberR_IRR_hi
MiscCropTree_TiberR_IRR_lo
MiscCropTree_TiberR_RFD_hi
MiscCropTree_TiberR_RFD_lo
MiscCropTree_TigrEuphR_IRR_hi
MiscCropTree_TigrEuphR_IRR_lo
MiscCropTree_TigrEuphR_RFD_hi
MiscCropTree_TigrEuphR_RFD_lo
MiscCropTree_TocantinsR_IRR_hi
MiscCropTree_TocantinsR_IRR_lo
MiscCropTree_TocantinsR_RFD_hi
MiscCropTree_TocantinsR_RFD_lo
MiscCropTree_UsaColoRN_RFD_hi
MiscCropTree_UsaColoRN_RFD_lo
MiscCropTree_UsaColoRS_RFD_hi
MiscCropTree_UsaColoRS_RFD_lo
MiscCropTree_UsaCstE_RFD_hi
MiscCropTree_UsaCstE_RFD_lo
MiscCropTree_UsaCstNE_RFD_hi
MiscCropTree_UsaCstNE_RFD_lo
MiscCropTree_UsaCstSE_RFD_hi
MiscCropTree_UsaCstSE_RFD_lo
MiscCropTree_UsaPacNW_RFD_hi
MiscCropTree_UsaPacNW_RFD_lo
MiscCropTree_VietnamCst_IRR_hi
MiscCropTree_VietnamCst_IRR_lo
MiscCropTree_VietnamCst_RFD_hi
MiscCropTree_VietnamCst_RFD_lo
MiscCropTree_VoltaR_IRR_hi
MiscCropTree_VoltaR_IRR_lo
MiscCropTree_VoltaR_RFD_hi
MiscCropTree_VoltaR_RFD_lo
MiscCropTree_WislaR_RFD_hi
MiscCropTree_WislaR_RFD_lo
MiscCropTree_XunJiang_IRR_hi
MiscCropTree_XunJiang_IRR_lo
MiscCropTree_XunJiang_RFD_hi
MiscCropTree_XunJiang_RFD_lo
MiscCropTree_Yangtze_IRR_hi
MiscCropTree_Yangtze_IRR_lo
MiscCropTree_Yangtze_RFD_hi
MiscCropTree_Yangtze_RFD_lo
MiscCropTree_YucatanP_IRR_hi
MiscCropTree_YucatanP_IRR_lo
MiscCropTree_YucatanP_RFD_hi
MiscCropTree_YucatanP_RFD_lo
MiscCropTree_ZambeziR_IRR_hi
MiscCropTree_ZambeziR_IRR_lo
MiscCropTree_ZambeziR_RFD_hi
MiscCropTree_ZambeziR_RFD_lo
MiscCropTree_ZiyaHe_IRR_hi
MiscCropTree_ZiyaHe_IRR_lo
MiscCropTree_ZiyaHe_RFD_hi
MiscCropTree_ZiyaHe_RFD_lo
natural gas steam reforming
natural gas steam reforming CCS
NG
nitric acid
NutsSeeds_AdrBlkSea_IRR_hi
NutsSeeds_AdrBlkSea_IRR_lo
NutsSeeds_AdrBlkSea_RFD_hi
NutsSeeds_AdrBlkSea_RFD_lo
NutsSeeds_AfrCstE_RFD_hi
NutsSeeds_AfrCstE_RFD_lo
NutsSeeds_AfrCstNE_IRR_hi
NutsSeeds_AfrCstNE_IRR_lo
NutsSeeds_AfrCstNE_RFD_hi
NutsSeeds_AfrCstNE_RFD_lo
NutsSeeds_AfrCstNW_IRR_hi

NutsSeeds_AfrCstNW_IRR_lo
NutsSeeds_AfrCstNW_RFD_hi
NutsSeeds_AfrCstNW_RFD_lo
NutsSeeds_AfrCstS_IRR_hi
NutsSeeds_AfrCstS_IRR_lo
NutsSeeds_AfrCstS_RFD_hi
NutsSeeds_AfrCstS_RFD_lo
NutsSeeds_AfrCstSE_IRR_hi
NutsSeeds_AfrCstSE_IRR_lo
NutsSeeds_AfrCstSE_RFD_hi
NutsSeeds_AfrCstSE_RFD_lo
NutsSeeds_AfrCstSSW_IRR_hi
NutsSeeds_AfrCstSSW_IRR_lo
NutsSeeds_AfrCstSSW_RFD_hi
NutsSeeds_AfrCstSSW_RFD_lo
NutsSeeds_AfrCstSW_RFD_hi
NutsSeeds_AfrCstSW_RFD_lo
NutsSeeds_AfrCstW_RFD_hi
NutsSeeds_AfrCstW_RFD_lo
NutsSeeds_AfrIntN_IRR_hi
NutsSeeds_AfrIntN_IRR_lo
NutsSeeds_AfrIntN_RFD_hi
NutsSeeds_AfrIntN_RFD_lo
NutsSeeds_AfrIntS_RFD_hi
NutsSeeds_AfrIntS_RFD_lo
NutsSeeds_AmazonR_RFD_hi
NutsSeeds_AmazonR_RFD_lo
NutsSeeds_AmuDaryaR_RFD_hi
NutsSeeds_AmuDaryaR_RFD_lo
NutsSeeds_AmurR_IRR_hi
NutsSeeds_AmurR_IRR_lo
NutsSeeds_AmurR_RFD_hi
NutsSeeds_AmurR_RFD_lo
NutsSeeds_AngolaCst_RFD_hi
NutsSeeds_AngolaCst_RFD_lo
NutsSeeds_ArabianP_IRR_hi
NutsSeeds_ArabianP_IRR_lo
NutsSeeds_ArabianSea_RFD_hi
NutsSeeds_ArabianSea_RFD_lo
NutsSeeds_ArgColoR_RFD_hi
NutsSeeds_ArgColoR_RFD_lo
NutsSeeds_ArgCstN_IRR_hi
NutsSeeds_ArgCstN_IRR_lo
NutsSeeds_ArgCstN_RFD_hi
NutsSeeds_ArgCstN_RFD_lo
NutsSeeds_ArkWhtRedR_IRR_hi
NutsSeeds_ArkWhtRedR_IRR_lo
NutsSeeds_ArkWhtRedR_RFD_hi
NutsSeeds_ArkWhtRedR_RFD_lo
NutsSeeds_AusCstE_IRR_hi
NutsSeeds_AusCstE_IRR_lo
NutsSeeds_AusCstE_RFD_hi
NutsSeeds_AusCstE_RFD_lo
NutsSeeds_AusCstN_IRR_hi
NutsSeeds_AusCstN_IRR_lo
NutsSeeds_AusCstN_RFD_hi
NutsSeeds_AusCstN_RFD_lo
NutsSeeds_BengalBay_IRR_hi
NutsSeeds_BengalBay_IRR_lo
NutsSeeds_BengalBay_RFD_hi
NutsSeeds_BengalBay_RFD_lo
NutsSeeds_BengalW_IRR_hi
NutsSeeds_BengalW_IRR_lo
NutsSeeds_BengalW_RFD_hi
NutsSeeds_BengalW_RFD_lo
NutsSeeds_BlackSeaS_IRR_hi
NutsSeeds_BlackSeaS_IRR_lo
NutsSeeds_BlackSeaS_RFD_hi
NutsSeeds_BlackSeaS_RFD_lo
NutsSeeds_BoHai_IRR_hi
NutsSeeds_BoHai_IRR_lo
NutsSeeds_BoHai_RFD_hi
NutsSeeds_BoHai_RFD_lo
NutsSeeds_BorneoCstN_RFD_hi
NutsSeeds_BorneoCstN_RFD_lo
NutsSeeds_BrahmaniR_IRR_hi
NutsSeeds_BrahmaniR_IRR_lo
NutsSeeds_BrahmaniR_RFD_hi
NutsSeeds_BrahmaniR_RFD_lo
NutsSeeds_BrzCstE_IRR_hi
NutsSeeds_BrzCstE_IRR_lo
NutsSeeds_BrzCstE_RFD_hi
NutsSeeds_BrzCstE_RFD_lo
NutsSeeds_BrzCstN_RFD_hi
NutsSeeds_BrzCstN_RFD_lo
NutsSeeds_BrzCstS_IRR_hi
NutsSeeds_BrzCstS_IRR_lo
NutsSeeds_BrzCstS_RFD_hi
NutsSeeds_BrzCstS_RFD_lo
NutsSeeds_Caribbean_RFD_hi
NutsSeeds_Caribbean_RFD_lo
NutsSeeds_CaspianE_RFD_hi
NutsSeeds_CaspianE_RFD_lo
NutsSeeds_CaspianNE_RFD_hi
NutsSeeds_CaspianNE_RFD_lo
NutsSeeds_CaspianSW_IRR_hi

NutsSeeds_CaspianSW_IRR_lo
NutsSeeds_CaspianSW_RFD_hi
NutsSeeds_CaspianSW_RFD_lo
NutsSeeds_CauveryR_IRR_hi
NutsSeeds_CauveryR_IRR_lo
NutsSeeds_CauveryR_RFD_hi
NutsSeeds_CauveryR_RFD_lo
NutsSeeds_ChaoPhrR_RFD_hi
NutsSeeds_ChaoPhrR_RFD_lo
NutsSeeds_ChinaCst_IRR_hi
NutsSeeds_ChinaCst_IRR_lo
NutsSeeds_ChinaCst_RFD_hi
NutsSeeds_ChinaCst_RFD_lo
NutsSeeds_CntAmer_RFD_hi
NutsSeeds_CntAmer_RFD_lo
NutsSeeds_ColEcuaCst_RFD_hi
NutsSeeds_ColEcuaCst_RFD_lo
NutsSeeds_CongoR_RFD_hi
NutsSeeds_CongoR_RFD_lo
NutsSeeds_DanubeR_IRR_hi
NutsSeeds_DanubeR_IRR_lo
NutsSeeds_DanubeR_RFD_hi
NutsSeeds_DanubeR_RFD_lo
NutsSeeds_DeadSea_IRR_hi
NutsSeeds_DeadSea_IRR_lo
NutsSeeds_DeadSea_RFD_hi
NutsSeeds_DeadSea_RFD_lo
NutsSeeds_DnkGrmCst_IRR_hi
NutsSeeds_DnkGrmCst_IRR_lo
NutsSeeds_DnkGrmCst_RFD_hi
NutsSeeds_DnkGrmCst_RFD_lo
NutsSeeds_DouroR_RFD_hi
NutsSeeds_DouroR_RFD_lo
NutsSeeds_EbroR_IRR_hi
NutsSeeds_EbroR_IRR_lo
NutsSeeds_EbroR_RFD_hi
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NutsSeedsTree_ScheldtR_IRR_lo
NutsSeedsTree_ScheldtR_RFD_hi
NutsSeedsTree_ScheldtR_RFD_lo
NutsSeedsTree_SChinaSea_IRR_hi
NutsSeedsTree_SChinaSea_IRR_lo
NutsSeedsTree_SChinaSea_RFD_hi
NutsSeedsTree_SChinaSea_RFD_lo
NutsSeedsTree_SeineR_IRR_hi
NutsSeedsTree_SeineR_IRR_lo
NutsSeedsTree_SeineR_RFD_hi
NutsSeedsTree_SeineR_RFD_lo
NutsSeedsTree_SenegalR_IRR_hi
NutsSeedsTree_SenegalR_IRR_lo
NutsSeedsTree_SenegalR_RFD_hi
NutsSeedsTree_SenegalR_RFD_lo
NutsSeedsTree_SepikR_RFD_hi
NutsSeedsTree_SepikR_RFD_lo
NutsSeedsTree_ShebJubR_IRR_hi
NutsSeedsTree_ShebJubR_IRR_lo
NutsSeedsTree_ShebJubR_RFD_hi
NutsSeedsTree_ShebJubR_RFD_lo

NutsSeedsTree_SiberiaW_RFD_hi
NutsSeedsTree_SiberiaW_RFD_lo
NutsSeedsTree_SinaiP_IRR_hi
NutsSeedsTree_SinaiP_IRR_lo
NutsSeedsTree_SinaiP_RFD_hi
NutsSeedsTree_SinaiP_RFD_lo
NutsSeedsTree_SittaungR_IRR_hi
NutsSeedsTree_SittaungR_IRR_lo
NutsSeedsTree_SittaungR_RFD_hi
NutsSeedsTree_SittaungR_RFD_lo
NutsSeedsTree_SolomonIsl_RFD_hi
NutsSeedsTree_SolomonIsl_RFD_lo
NutsSeedsTree_SpainCstSE_IRR_hi
NutsSeedsTree_SpainCstSE_IRR_lo
NutsSeedsTree_SpainCstSE_RFD_hi
NutsSeedsTree_SpainCstSE_RFD_lo
NutsSeedsTree_SriLanka_RFD_hi
NutsSeedsTree_SriLanka_RFD_lo
NutsSeedsTree_Sulawesi_IRR_hi
NutsSeedsTree_Sulawesi_IRR_lo
NutsSeedsTree_Sulawesi_RFD_hi
NutsSeedsTree_Sulawesi_RFD_lo
NutsSeedsTree_Sumatra_IRR_hi
NutsSeedsTree_Sumatra_IRR_lo
NutsSeedsTree_Sumatra_RFD_hi
NutsSeedsTree_Sumatra_RFD_lo
NutsSeedsTree_SyrDaryaR_IRR_hi
NutsSeedsTree_SyrDaryaR_IRR_lo
NutsSeedsTree_SyrDaryaR_RFD_hi
NutsSeedsTree_SyrDaryaR_RFD_lo
NutsSeedsTree_TagusR_IRR_hi
NutsSeedsTree_TagusR_IRR_lo
NutsSeedsTree_TagusR_RFD_hi
NutsSeedsTree_TagusR_RFD_lo
NutsSeedsTree_Taiwan_IRR_hi
NutsSeedsTree_Taiwan_IRR_lo
NutsSeedsTree_Taiwan_RFD_hi
NutsSeedsTree_Taiwan_RFD_lo
NutsSeedsTree_TaptiR_IRR_hi
NutsSeedsTree_TaptiR_IRR_lo
NutsSeedsTree_TaptiR_RFD_hi
NutsSeedsTree_TaptiR_RFD_lo
NutsSeedsTree_Tarim_IRR_hi
NutsSeedsTree_Tarim_IRR_lo
NutsSeedsTree_Tarim_RFD_hi
NutsSeedsTree_Tarim_RFD_lo
NutsSeedsTree_Tehuantpc_IRR_hi
NutsSeedsTree_Tehuantpc_IRR_lo
NutsSeedsTree_Tehuantpc_RFD_hi
NutsSeedsTree_Tehuantpc_RFD_lo
NutsSeedsTree_TennR_IRR_hi
NutsSeedsTree_TennR_IRR_lo
NutsSeedsTree_TennR_RFD_hi
NutsSeedsTree_TennR_RFD_lo
NutsSeedsTree_TexasCst_IRR_hi
NutsSeedsTree_TexasCst_IRR_lo
NutsSeedsTree_TexasCst_RFD_hi
NutsSeedsTree_TexasCst_RFD_lo
NutsSeedsTree_ThaiGulf_IRR_hi
NutsSeedsTree_ThaiGulf_IRR_lo
NutsSeedsTree_ThaiGulf_RFD_hi
NutsSeedsTree_ThaiGulf_RFD_lo
NutsSeedsTree_TiberR_IRR_hi
NutsSeedsTree_TiberR_IRR_lo
NutsSeedsTree_TiberR_RFD_hi
NutsSeedsTree_TiberR_RFD_lo
NutsSeedsTree_TigrEuphR_IRR_hi
NutsSeedsTree_TigrEuphR_IRR_lo
NutsSeedsTree_TigrEuphR_RFD_hi
NutsSeedsTree_TigrEuphR_RFD_lo
NutsSeedsTree_TocantinsR_IRR_hi
NutsSeedsTree_TocantinsR_IRR_lo
NutsSeedsTree_TocantinsR_RFD_hi
NutsSeedsTree_TocantinsR_RFD_lo
NutsSeedsTree_UralR_IRR_hi
NutsSeedsTree_UralR_IRR_lo
NutsSeedsTree_UralR_RFD_hi
NutsSeedsTree_UralR_RFD_lo
NutsSeedsTree_UsaColoRN_IRR_hi
NutsSeedsTree_UsaColoRN_IRR_lo
NutsSeedsTree_UsaColoRN_RFD_hi
NutsSeedsTree_UsaColoRN_RFD_lo
NutsSeedsTree_UsaColoRS_IRR_hi
NutsSeedsTree_UsaColoRS_IRR_lo
NutsSeedsTree_UsaColoRS_RFD_hi
NutsSeedsTree_UsaColoRS_RFD_lo
NutsSeedsTree_UsaCstE_IRR_hi
NutsSeedsTree_UsaCstE_IRR_lo
NutsSeedsTree_UsaCstE_RFD_hi
NutsSeedsTree_UsaCstE_RFD_lo
NutsSeedsTree_UsaCstNE_IRR_hi
NutsSeedsTree_UsaCstNE_IRR_lo
NutsSeedsTree_UsaCstNE_RFD_hi
NutsSeedsTree_UsaCstNE_RFD_lo
NutsSeedsTree_UsaCstSE_IRR_hi
NutsSeedsTree_UsaCstSE_IRR_lo

NutsSeedsTree_UsaCstSE_RFD_hi
NutsSeedsTree_UsaCstSE_RFD_lo
NutsSeedsTree_UsaPacNW_IRR_hi
NutsSeedsTree_UsaPacNW_IRR_lo
NutsSeedsTree_UsaPacNW_RFD_hi
NutsSeedsTree_UsaPacNW_RFD_lo
NutsSeedsTree_VietnamCst_IRR_hi
NutsSeedsTree_VietnamCst_IRR_lo
NutsSeedsTree_VietnamCst_RFD_hi
NutsSeedsTree_VietnamCst_RFD_lo
NutsSeedsTree_VolgaR_IRR_hi
NutsSeedsTree_VolgaR_IRR_lo
NutsSeedsTree_VolgaR_RFD_hi
NutsSeedsTree_VolgaR_RFD_lo
NutsSeedsTree_VoltaR_IRR_hi
NutsSeedsTree_VoltaR_IRR_lo
NutsSeedsTree_VoltaR_RFD_hi
NutsSeedsTree_VoltaR_RFD_lo
NutsSeedsTree_WislaR_IRR_hi
NutsSeedsTree_WislaR_IRR_lo
NutsSeedsTree_WislaR_RFD_hi
NutsSeedsTree_WislaR_RFD_lo
NutsSeedsTree_XunJiang_IRR_hi
NutsSeedsTree_XunJiang_IRR_lo
NutsSeedsTree_XunJiang_RFD_hi
NutsSeedsTree_XunJiang_RFD_lo
NutsSeedsTree_Yangtze_IRR_hi
NutsSeedsTree_Yangtze_IRR_lo
NutsSeedsTree_Yangtze_RFD_hi
NutsSeedsTree_Yangtze_RFD_lo
NutsSeedsTree_YeniseiR_IRR_hi
NutsSeedsTree_YeniseiR_IRR_lo
NutsSeedsTree_YeniseiR_RFD_hi
NutsSeedsTree_YeniseiR_RFD_lo
NutsSeedsTree_YucatanP_IRR_hi
NutsSeedsTree_YucatanP_IRR_lo
NutsSeedsTree_YucatanP_RFD_hi
NutsSeedsTree_YucatanP_RFD_lo
NutsSeedsTree_ZambeziR_IRR_hi
NutsSeedsTree_ZambeziR_IRR_lo
NutsSeedsTree_ZambeziR_RFD_hi
NutsSeedsTree_ZambeziR_RFD_lo
NutsSeedsTree_ZiyaHe_IRR_hi
NutsSeedsTree_ZiyaHe_IRR_lo
NutsSeedsTree_ZiyaHe_RFD_hi
NutsSeedsTree_ZiyaHe_RFD_lo
OilCrop_AdrBlkSea_IRR_hi
OilCrop_AdrBlkSea_IRR_lo
OilCrop_AdrBlkSea_RFD_hi
OilCrop_AdrBlkSea_RFD_lo
OilCrop_AfrCstE_IRR_hi
OilCrop_AfrCstE_IRR_lo
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OilCrop_AfrIntN_IRR_lo
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OilCrop_AfrIntS_IRR_lo
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OilCrop_AmazonR_IRR_lo
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OilCrop_AmazonR_RFD_lo
OilCrop_AmuDaryaR_IRR_hi
OilCrop_AmuDaryaR_IRR_lo
OilCrop_AmuDaryaR_RFD_hi
OilCrop_AmuDaryaR_RFD_lo

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OilCrop_AmurR_IRR_lo
OilCrop_AmurR_RFD_hi
OilCrop_AmurR_RFD_lo
OilCrop_AngolaCst_IRR_hi
OilCrop_AngolaCst_IRR_lo
OilCrop_AngolaCst_RFD_hi
OilCrop_AngolaCst_RFD_lo
OilCrop_ArabianP_IRR_hi
OilCrop_ArabianP_IRR_lo
OilCrop_ArabianP_RFD_hi
OilCrop_ArabianP_RFD_lo
OilCrop_ArabianSea_IRR_hi
OilCrop_ArabianSea_IRR_lo
OilCrop_ArabianSea_RFD_hi
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OilCrop_BalticSea_RFD_lo
OilCrop_BarentsSea_IRR_hi
OilCrop_BarentsSea_IRR_lo
OilCrop_BarentsSea_RFD_hi
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OilCrop_BlackSeaS_RFD_lo
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OilCrop_BoHai_IRR_lo
OilCrop_BoHai_RFD_hi
OilCrop_BoHai_RFD_lo
OilCrop_BorneoCstN_IRR_hi
OilCrop_BorneoCstN_IRR_lo
OilCrop_BorneoCstN_RFD_hi
OilCrop_BorneoCstN_RFD_lo
OilCrop_BrahmaniR_IRR_hi
OilCrop_BrahmaniR_IRR_lo
OilCrop_BrahmaniR_RFD_hi
OilCrop_BrahmaniR_RFD_lo
OilCrop_BrzCstE_IRR_hi
OilCrop_BrzCstE_IRR_lo
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OilCrop_BrzCstS_IRR_hi
OilCrop_BrzCstS_IRR_lo
OilCrop_BrzCstS_RFD_hi
OilCrop_BrzCstS_RFD_lo

OilCrop_California_IRR_hi
OilCrop_California_IRR_lo
OilCrop_California_RFD_hi
OilCrop_California_RFD_lo
OilCrop_CanAtl_IRR_hi
OilCrop_CanAtl_IRR_lo
OilCrop_CanAtl_RFD_hi
OilCrop_CanAtl_RFD_lo
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OilCrop_Caribbean_IRR_lo
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OilCrop_ColEcuaCst_IRR_lo
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OilCrop_DonR_IRR_lo
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OilCrop_DvinaRN_RFD_lo
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OilCrop_EbroR_IRR_lo
OilCrop_EbroR_RFD_hi
OilCrop_EbroR_RFD_lo

OilCrop_EJrdnSyr_IRR_hi
OilCrop_EJrdnSyr_IRR_lo
OilCrop_EJrdnSyr_RFD_hi
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OilCrop_ElbeR_IRR_lo
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OilCrop_FarahrudR_IRR_lo
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OilCrop_Finland_IRR_lo
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OilCrop_Gironde_IRR_lo
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OilCrop_Gironde_RFD_lo
OilCrop_Gobi_IRR_hi
OilCrop_Gobi_IRR_lo
OilCrop_Gobi_RFD_hi
OilCrop_Gobi_RFD_lo
OilCrop_GodavariR_IRR_hi
OilCrop_GodavariR_IRR_lo
OilCrop_GodavariR_RFD_hi
OilCrop_GodavariR_RFD_lo
OilCrop_GreatBasin_IRR_hi
OilCrop_GreatBasin_IRR_lo
OilCrop_GreatBasin_RFD_hi
OilCrop_GreatBasin_RFD_lo
OilCrop_GreatLakes_IRR_hi
OilCrop_GreatLakes_IRR_lo
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OilCrop_GreatLakes_RFD_lo
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OilCrop_GrijUsuR_IRR_lo
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OilCrop_GrijUsuR_RFD_lo
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OilCrop_GuineaGulf_IRR_lo
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OilCrop_GuineaGulf_RFD_lo
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OilCrop_Hainan_IRR_lo
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OilCrop_Hainan_RFD_lo
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OilCrop_HamuMashR_IRR_lo
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OilCrop_Helmand_IRR_lo
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OilCrop_Helmand_RFD_lo
OilCrop_Hong_IRR_hi
OilCrop_Hong_IRR_lo
OilCrop_Hong_RFD_hi
OilCrop_Hong_RFD_lo
OilCrop_HuangHeR_IRR_hi
OilCrop_HuangHeR_IRR_lo
OilCrop_HuangHeR_RFD_hi
OilCrop_HuangHeR_RFD_lo

OilCrop_HudsonBay_RFD_hi
OilCrop_HudsonBay_RFD_lo
OilCrop_IberiaCst_IRR_hi
OilCrop_IberiaCst_IRR_lo
OilCrop_IberiaCst_RFD_hi
OilCrop_IberiaCst_RFD_lo
OilCrop_IdnE_IRR_hi
OilCrop_IdnE_IRR_lo
OilCrop_IdnE_RFD_hi
OilCrop_IdnE_RFD_lo
OilCrop_IndCstE_IRR_hi
OilCrop_IndCstE_IRR_lo
OilCrop_IndCstE_RFD_hi
OilCrop_IndCstE_RFD_lo
OilCrop_IndCstNE_IRR_hi
OilCrop_IndCstNE_IRR_lo
OilCrop_IndCstNE_RFD_hi
OilCrop_IndCstNE_RFD_lo
OilCrop_IndCstS_IRR_hi
OilCrop_IndCstS_IRR_lo
OilCrop_IndCstS_RFD_hi
OilCrop_IndCstS_RFD_lo
OilCrop_IndCstW_IRR_hi
OilCrop_IndCstW_IRR_lo
OilCrop_IndCstW_RFD_hi
OilCrop_IndCstW_RFD_lo
OilCrop_IndusR_IRR_hi
OilCrop_IndusR_IRR_lo
OilCrop_IndusR_RFD_hi
OilCrop_IndusR_RFD_lo
OilCrop_Iran_IRR_hi
OilCrop_Iran_IRR_lo
OilCrop_Iran_RFD_hi
OilCrop_Iran_RFD_lo
OilCrop_Ireland_IRR_hi
OilCrop_Ireland_IRR_lo
OilCrop_Ireland_RFD_hi
OilCrop_Ireland_RFD_lo
OilCrop_IrianJaya_IRR_hi
OilCrop_IrianJaya_IRR_lo
OilCrop_IrianJaya_RFD_hi
OilCrop_IrianJaya_RFD_lo
OilCrop_IrrawaddyR_IRR_hi
OilCrop_IrrawaddyR_IRR_lo
OilCrop_IrrawaddyR_RFD_hi
OilCrop_IrrawaddyR_RFD_lo
OilCrop_ItalyCstE_IRR_hi
OilCrop_ItalyCstE_IRR_lo
OilCrop_ItalyCstE_RFD_hi
OilCrop_ItalyCstE_RFD_lo
OilCrop_ItalyCstW_IRR_hi
OilCrop_ItalyCstW_IRR_lo
OilCrop_ItalyCstW_RFD_hi
OilCrop_ItalyCstW_RFD_lo
OilCrop_Japan_RFD_hi
OilCrop_Japan_RFD_lo
OilCrop_JavaTimor_IRR_hi
OilCrop_JavaTimor_IRR_lo
OilCrop_JavaTimor_RFD_hi
OilCrop_JavaTimor_RFD_lo
OilCrop_Kalimantan_IRR_hi
OilCrop_Kalimantan_IRR_lo
OilCrop_Kalimantan_RFD_hi
OilCrop_Kalimantan_RFD_lo
OilCrop_Korea_IRR_hi
OilCrop_Korea_IRR_lo
OilCrop_Korea_RFD_hi
OilCrop_Korea_RFD_lo
OilCrop_KrishnaR_IRR_hi
OilCrop_KrishnaR_IRR_lo
OilCrop_KrishnaR_RFD_hi
OilCrop_KrishnaR_RFD_lo
OilCrop_LaPuna_IRR_hi
OilCrop_LaPuna_IRR_lo
OilCrop_LaPuna_RFD_hi
OilCrop_LaPuna_RFD_lo
OilCrop_LBalkash_IRR_hi
OilCrop_LBalkash_IRR_lo
OilCrop_LBalkash_RFD_hi
OilCrop_LBalkash_RFD_lo
OilCrop_LChad_IRR_hi
OilCrop_LChad_IRR_lo
OilCrop_LChad_RFD_hi
OilCrop_LChad_RFD_lo
OilCrop_LenaR_IRR_hi
OilCrop_LenaR_IRR_lo
OilCrop_LenaR_RFD_hi
OilCrop_LenaR_RFD_lo
OilCrop_LimpopoR_IRR_hi
OilCrop_LimpopoR_IRR_lo
OilCrop_LimpopoR_RFD_hi
OilCrop_LimpopoR_RFD_lo
OilCrop_LoireR_IRR_hi
OilCrop_LoireR_IRR_lo
OilCrop_LoireR_RFD_hi
OilCrop_LoireR_RFD_lo

OilCrop_Mackenzie_IRR_hi
OilCrop_Mackenzie_IRR_lo
OilCrop_Mackenzie_RFD_hi
OilCrop_Mackenzie_RFD_lo
OilCrop_Madagascar_IRR_hi
OilCrop_Madagascar_IRR_lo
OilCrop_Madagascar_RFD_hi
OilCrop_Madagascar_RFD_lo
OilCrop_MagdalenaR_IRR_hi
OilCrop_MagdalenaR_IRR_lo
OilCrop_MagdalenaR_RFD_hi
OilCrop_MagdalenaR_RFD_lo
OilCrop_MahanadiR_IRR_hi
OilCrop_MahanadiR_IRR_lo
OilCrop_MahanadiR_RFD_hi
OilCrop_MahanadiR_RFD_lo
OilCrop_MahiR_IRR_hi
OilCrop_MahiR_IRR_lo
OilCrop_MahiR_RFD_hi
OilCrop_MahiR_RFD_lo
OilCrop_MalaysiaP_IRR_hi
OilCrop_MalaysiaP_IRR_lo
OilCrop_MalaysiaP_RFD_hi
OilCrop_MalaysiaP_RFD_lo
OilCrop_MarChiq_IRR_hi
OilCrop_MarChiq_IRR_lo
OilCrop_MarChiq_RFD_hi
OilCrop_MarChiq_RFD_lo
OilCrop_MeditE_IRR_hi
OilCrop_MeditE_IRR_lo
OilCrop_MeditE_RFD_hi
OilCrop_MeditE_RFD_lo
OilCrop_MeditIsl_IRR_hi
OilCrop_MeditIsl_IRR_lo
OilCrop_MeditIsl_RFD_hi
OilCrop_MeditIsl_RFD_lo
OilCrop_MeditS_IRR_hi
OilCrop_MeditS_IRR_lo
OilCrop_MeditS_RFD_hi
OilCrop_MeditS_RFD_lo
OilCrop_Mekong_IRR_hi
OilCrop_Mekong_IRR_lo
OilCrop_Mekong_RFD_hi
OilCrop_Mekong_RFD_lo
OilCrop_MexBaja_IRR_hi
OilCrop_MexBaja_IRR_lo
OilCrop_MexBaja_RFD_hi
OilCrop_MexBaja_RFD_lo
OilCrop_MexCstNW_IRR_hi
OilCrop_MexCstNW_IRR_lo
OilCrop_MexCstNW_RFD_hi
OilCrop_MexCstNW_RFD_lo
OilCrop_MexCstW_IRR_hi
OilCrop_MexCstW_IRR_lo
OilCrop_MexCstW_RFD_hi
OilCrop_MexCstW_RFD_lo
OilCrop_MexGulf_IRR_hi
OilCrop_MexGulf_IRR_lo
OilCrop_MexGulf_RFD_hi
OilCrop_MexGulf_RFD_lo
OilCrop_MexInt_IRR_hi
OilCrop_MexInt_IRR_lo
OilCrop_MexInt_RFD_hi
OilCrop_MexInt_RFD_lo
OilCrop_MissouriR_IRR_hi
OilCrop_MissouriR_IRR_lo
OilCrop_MissouriR_RFD_hi
OilCrop_MissouriR_RFD_lo
OilCrop_MissppRN_IRR_hi
OilCrop_MissppRN_IRR_lo
OilCrop_MissppRN_RFD_hi
OilCrop_MissppRN_RFD_lo
OilCrop_MissppRS_RFD_hi
OilCrop_MissppRS_RFD_lo
OilCrop_MurrayDrlg_IRR_hi
OilCrop_MurrayDrlg_IRR_lo
OilCrop_MurrayDrlg_RFD_hi
OilCrop_MurrayDrlg_RFD_lo
OilCrop_NarmadaR_IRR_hi
OilCrop_NarmadaR_IRR_lo
OilCrop_NarmadaR_RFD_hi
OilCrop_NarmadaR_RFD_lo
OilCrop_NarvaR_IRR_hi
OilCrop_NarvaR_IRR_lo
OilCrop_NarvaR_RFD_hi
OilCrop_NarvaR_RFD_lo
OilCrop_NegroR_IRR_hi
OilCrop_NegroR_IRR_lo
OilCrop_NegroR_RFD_hi
OilCrop_NegroR_RFD_lo
OilCrop_NelsonR_IRR_hi
OilCrop_NelsonR_IRR_lo
OilCrop_NelsonR_RFD_hi
OilCrop_NelsonR_RFD_lo
OilCrop_NemanR_IRR_hi
OilCrop_NemanR_IRR_lo

OilCrop_NemanR_RFD_hi
OilCrop_NemanR_RFD_lo
OilCrop_NevaR_IRR_hi
OilCrop_NevaR_IRR_lo
OilCrop_NevaR_RFD_hi
OilCrop_NevaR_RFD_lo
OilCrop_NewZealand_IRR_hi
OilCrop_NewZealand_IRR_lo
OilCrop_NewZealand_RFD_hi
OilCrop_NewZealand_RFD_lo
OilCrop_NigerR_IRR_hi
OilCrop_NigerR_IRR_lo
OilCrop_NigerR_RFD_hi
OilCrop_NigerR_RFD_lo
OilCrop_NileR_IRR_hi
OilCrop_NileR_IRR_lo
OilCrop_NileR_RFD_hi
OilCrop_NileR_RFD_lo
OilCrop_NWTerr_IRR_hi
OilCrop_NWTerr_IRR_lo
OilCrop_NWTerr_RFD_hi
OilCrop_NWTerr_RFD_lo
OilCrop_ObR_IRR_hi
OilCrop_ObR_IRR_lo
OilCrop_ObR_RFD_hi
OilCrop_ObR_RFD_lo
OilCrop_OderR_IRR_hi
OilCrop_OderR_IRR_lo
OilCrop_OderR_RFD_hi
OilCrop_OderR_RFD_lo
OilCrop_OhioR_IRR_hi
OilCrop_OhioR_IRR_lo
OilCrop_OhioR_RFD_hi
OilCrop_OhioR_RFD_lo
OilCrop_OrangeR_IRR_hi
OilCrop_OrangeR_IRR_lo
OilCrop_OrangeR_RFD_hi
OilCrop_OrangeR_RFD_lo
OilCrop_OrinocoR_IRR_hi
OilCrop_OrinocoR_IRR_lo
OilCrop_OrinocoR_RFD_hi
OilCrop_OrinocoR_RFD_lo
OilCrop_PacArctic_IRR_hi
OilCrop_PacArctic_IRR_lo
OilCrop_PacArctic_RFD_hi
OilCrop_PacArctic_RFD_lo
OilCrop_Pampas_IRR_hi
OilCrop_Pampas_IRR_lo
OilCrop_Pampas_RFD_hi
OilCrop_Pampas_RFD_lo
OilCrop_Papaloapan_IRR_hi
OilCrop_Papaloapan_IRR_lo
OilCrop_Papaloapan_RFD_hi
OilCrop_Papaloapan_RFD_lo
OilCrop_ParnaibaR_IRR_hi
OilCrop_ParnaibaR_IRR_lo
OilCrop_ParnaibaR_RFD_hi
OilCrop_ParnaibaR_RFD_lo
OilCrop_Patagonia_IRR_hi
OilCrop_Patagonia_IRR_lo
OilCrop_Patagonia_RFD_hi
OilCrop_Patagonia_RFD_lo
OilCrop_PennarR_IRR_hi
OilCrop_PennarR_IRR_lo
OilCrop_PennarR_RFD_hi
OilCrop_PennarR_RFD_lo
OilCrop_PersianGulf_IRR_hi
OilCrop_PersianGulf_IRR_lo
OilCrop_PersianGulf_RFD_hi
OilCrop_PersianGulf_RFD_lo
OilCrop_PeruCst_IRR_hi
OilCrop_PeruCst_IRR_lo
OilCrop_PeruCst_RFD_hi
OilCrop_PeruCst_RFD_lo
OilCrop_Phlppns_IRR_hi
OilCrop_Phlppns_IRR_lo
OilCrop_Phlppns_RFD_hi
OilCrop_Phlppns_RFD_lo
OilCrop_PolandCst_IRR_hi
OilCrop_PolandCst_IRR_lo
OilCrop_PolandCst_RFD_hi
OilCrop_PolandCst_RFD_lo
OilCrop_PoR_IRR_hi
OilCrop_PoR_IRR_lo
OilCrop_PoR_RFD_hi
OilCrop_PoR_RFD_lo
OilCrop_RedSeaE_IRR_hi
OilCrop_RedSeaE_IRR_lo
OilCrop_RedSeaE_RFD_hi
OilCrop_RedSeaE_RFD_lo
OilCrop_RhineR_IRR_hi
OilCrop_RhineR_IRR_lo
OilCrop_RhineR_RFD_hi
OilCrop_RhineR_RFD_lo
OilCrop_RhoneR_IRR_hi
OilCrop_RhoneR_IRR_lo

OilCrop_RhoneR_RFD_hi
OilCrop_RhoneR_RFD_lo
OilCrop_RiftValley_IRR_hi
OilCrop_RiftValley_IRR_lo
OilCrop_RiftValley_RFD_hi
OilCrop_RiftValley_RFD_lo
OilCrop_RioBalsas_IRR_hi
OilCrop_RioBalsas_IRR_lo
OilCrop_RioBalsas_RFD_hi
OilCrop_RioBalsas_RFD_lo
OilCrop_RioGrande_IRR_hi
OilCrop_RioGrande_IRR_lo
OilCrop_RioGrande_RFD_hi
OilCrop_RioGrande_RFD_lo
OilCrop_RioLaPlata_IRR_hi
OilCrop_RioLaPlata_IRR_lo
OilCrop_RioLaPlata_RFD_hi
OilCrop_RioLaPlata_RFD_lo
OilCrop_RioLerma_IRR_hi
OilCrop_RioLerma_IRR_lo
OilCrop_RioLerma_RFD_hi
OilCrop_RioLerma_RFD_lo
OilCrop_RioVerde_IRR_hi
OilCrop_RioVerde_IRR_lo
OilCrop_RioVerde_RFD_hi
OilCrop_RioVerde_RFD_lo
OilCrop_RusCstSE_IRR_hi
OilCrop_RusCstSE_IRR_lo
OilCrop_RusCstSE_RFD_hi
OilCrop_RusCstSE_RFD_lo
OilCrop_SabarmatiR_IRR_hi
OilCrop_SabarmatiR_IRR_lo
OilCrop_SabarmatiR_RFD_hi
OilCrop_SabarmatiR_RFD_lo
OilCrop_Salinas_IRR_hi
OilCrop_Salinas_IRR_lo
OilCrop_Salinas_RFD_hi
OilCrop_Salinas_RFD_lo
OilCrop_Salween_IRR_hi
OilCrop_Salween_IRR_lo
OilCrop_Salween_RFD_hi
OilCrop_Salween_RFD_lo
OilCrop_SAmerCstN_IRR_hi
OilCrop_SAmerCstN_IRR_lo
OilCrop_SAmerCstN_RFD_hi
OilCrop_SAmerCstN_RFD_lo
OilCrop_SAmerCstNE_IRR_hi
OilCrop_SAmerCstNE_IRR_lo
OilCrop_SAmerCstNE_RFD_hi
OilCrop_SAmerCstNE_RFD_lo
OilCrop_SaoFrancR_IRR_hi
OilCrop_SaoFrancR_IRR_lo
OilCrop_SaoFrancR_RFD_hi
OilCrop_SaoFrancR_RFD_lo
OilCrop_ScheldtR_IRR_hi
OilCrop_ScheldtR_IRR_lo
OilCrop_ScheldtR_RFD_hi
OilCrop_ScheldtR_RFD_lo
OilCrop_SChinaSea_IRR_hi
OilCrop_SChinaSea_IRR_lo
OilCrop_SChinaSea_RFD_hi
OilCrop_SChinaSea_RFD_lo
OilCrop_ScndnvN_RFD_hi
OilCrop_ScndnvN_RFD_lo
OilCrop_Scotland_IRR_hi
OilCrop_Scotland_IRR_lo
OilCrop_Scotland_RFD_hi
OilCrop_Scotland_RFD_lo
OilCrop_SeineR_IRR_hi
OilCrop_SeineR_IRR_lo
OilCrop_SeineR_RFD_hi
OilCrop_SeineR_RFD_lo
OilCrop_SenegalR_IRR_hi
OilCrop_SenegalR_IRR_lo
OilCrop_SenegalR_RFD_hi
OilCrop_SenegalR_RFD_lo
OilCrop_SepikR_RFD_hi
OilCrop_SepikR_RFD_lo
OilCrop_ShebJubR_IRR_hi
OilCrop_ShebJubR_IRR_lo
OilCrop_ShebJubR_RFD_hi
OilCrop_ShebJubR_RFD_lo
OilCrop_SiberiaW_IRR_hi
OilCrop_SiberiaW_IRR_lo
OilCrop_SiberiaW_RFD_hi
OilCrop_SiberiaW_RFD_lo
OilCrop_SinaiP_IRR_hi
OilCrop_SinaiP_IRR_lo
OilCrop_SittaungR_IRR_hi
OilCrop_SittaungR_IRR_lo
OilCrop_SittaungR_RFD_hi
OilCrop_SittaungR_RFD_lo
OilCrop_SpainCstSE_IRR_hi
OilCrop_SpainCstSE_IRR_lo
OilCrop_SpainCstSE_RFD_hi
OilCrop_SpainCstSE_RFD_lo

OilCrop_SriLanka_IRR_hi
OilCrop_SriLanka_IRR_lo
OilCrop_SriLanka_RFD_hi
OilCrop_SriLanka_RFD_lo
OilCrop_StLwrncR_IRR_hi
OilCrop_StLwrncR_IRR_lo
OilCrop_StLwrncR_RFD_hi
OilCrop_StLwrncR_RFD_lo
OilCrop_Sulawesi_IRR_hi
OilCrop_Sulawesi_IRR_lo
OilCrop_Sulawesi_RFD_hi
OilCrop_Sulawesi_RFD_lo
OilCrop_Sumatra_IRR_hi
OilCrop_Sumatra_IRR_lo
OilCrop_Sumatra_RFD_hi
OilCrop_Sumatra_RFD_lo
OilCrop_Sweden_IRR_hi
OilCrop_Sweden_IRR_lo
OilCrop_Sweden_RFD_hi
OilCrop_Sweden_RFD_lo
OilCrop_SyrDaryaR_IRR_hi
OilCrop_SyrDaryaR_IRR_lo
OilCrop_SyrDaryaR_RFD_hi
OilCrop_SyrDaryaR_RFD_lo
OilCrop_TagusR_IRR_hi
OilCrop_TagusR_IRR_lo
OilCrop_TagusR_RFD_hi
OilCrop_TagusR_RFD_lo
OilCrop_Taiwan_IRR_hi
OilCrop_Taiwan_IRR_lo
OilCrop_Taiwan_RFD_hi
OilCrop_Taiwan_RFD_lo
OilCrop_TaptiR_IRR_hi
OilCrop_TaptiR_IRR_lo
OilCrop_TaptiR_RFD_hi
OilCrop_TaptiR_RFD_lo
OilCrop_Tarim_IRR_hi
OilCrop_Tarim_IRR_lo
OilCrop_Tarim_RFD_hi
OilCrop_Tarim_RFD_lo
OilCrop_Tasmania_IRR_hi
OilCrop_Tasmania_IRR_lo
OilCrop_Tasmania_RFD_hi
OilCrop_Tasmania_RFD_lo
OilCrop_Tehuantpc_IRR_hi
OilCrop_Tehuantpc_IRR_lo
OilCrop_Tehuantpc_RFD_hi
OilCrop_Tehuantpc_RFD_lo
OilCrop_TennR_RFD_hi
OilCrop_TennR_RFD_lo
OilCrop_TexasCst_IRR_hi
OilCrop_TexasCst_IRR_lo
OilCrop_TexasCst_RFD_hi
OilCrop_TexasCst_RFD_lo
OilCrop_ThaiGulf_IRR_hi
OilCrop_ThaiGulf_IRR_lo
OilCrop_ThaiGulf_RFD_hi
OilCrop_ThaiGulf_RFD_lo
OilCrop_TiberR_IRR_hi
OilCrop_TiberR_IRR_lo
OilCrop_TiberR_RFD_hi
OilCrop_TiberR_RFD_lo
OilCrop_TigrEuphR_IRR_hi
OilCrop_TigrEuphR_IRR_lo
OilCrop_TigrEuphR_RFD_hi
OilCrop_TigrEuphR_RFD_lo
OilCrop_TocantinsR_IRR_hi
OilCrop_TocantinsR_IRR_lo
OilCrop_TocantinsR_RFD_hi
OilCrop_TocantinsR_RFD_lo
OilCrop_UralR_IRR_hi
OilCrop_UralR_IRR_lo
OilCrop_UralR_RFD_hi
OilCrop_UralR_RFD_lo
OilCrop_UsaColoRN_IRR_hi
OilCrop_UsaColoRN_IRR_lo
OilCrop_UsaColoRN_RFD_hi
OilCrop_UsaColoRN_RFD_lo
OilCrop_UsaColoRS_IRR_hi
OilCrop_UsaColoRS_IRR_lo
OilCrop_UsaColoRS_RFD_hi
OilCrop_UsaColoRS_RFD_lo
OilCrop_UsaCstE_IRR_hi
OilCrop_UsaCstE_IRR_lo
OilCrop_UsaCstE_RFD_hi
OilCrop_UsaCstE_RFD_lo
OilCrop_UsaCstNE_IRR_hi
OilCrop_UsaCstNE_IRR_lo
OilCrop_UsaCstNE_RFD_hi
OilCrop_UsaCstNE_RFD_lo
OilCrop_UsaCstSE_IRR_hi
OilCrop_UsaCstSE_IRR_lo
OilCrop_UsaCstSE_RFD_hi
OilCrop_UsaCstSE_RFD_lo
OilCrop_UsaPacNW_IRR_hi
OilCrop_UsaPacNW_IRR_lo

OilCrop_UsaPacNW_RFD_hi
OilCrop_UsaPacNW_RFD_lo
OilCrop_VietnamCst_IRR_hi
OilCrop_VietnamCst_IRR_lo
OilCrop_VietnamCst_RFD_hi
OilCrop_VietnamCst_RFD_lo
OilCrop_VolgaR_IRR_hi
OilCrop_VolgaR_IRR_lo
OilCrop_VolgaR_RFD_hi
OilCrop_VolgaR_RFD_lo
OilCrop_VoltaR_IRR_hi
OilCrop_VoltaR_IRR_lo
OilCrop_VoltaR_RFD_hi
OilCrop_VoltaR_RFD_lo
OilCrop_WislaR_IRR_hi
OilCrop_WislaR_IRR_lo
OilCrop_WislaR_RFD_hi
OilCrop_WislaR_RFD_lo
OilCrop_XunJiang_IRR_hi
OilCrop_XunJiang_IRR_lo
OilCrop_XunJiang_RFD_hi
OilCrop_XunJiang_RFD_lo
OilCrop_Yangtze_IRR_hi
OilCrop_Yangtze_IRR_lo
OilCrop_Yangtze_RFD_hi
OilCrop_Yangtze_RFD_lo
OilCrop_YeniseiR_IRR_hi
OilCrop_YeniseiR_IRR_lo
OilCrop_YeniseiR_RFD_hi
OilCrop_YeniseiR_RFD_lo
OilCrop_YucatanP_IRR_hi
OilCrop_YucatanP_IRR_lo
OilCrop_YucatanP_RFD_hi
OilCrop_YucatanP_RFD_lo
OilCrop_ZambeziR_IRR_hi
OilCrop_ZambeziR_IRR_lo
OilCrop_ZambeziR_RFD_hi
OilCrop_ZambeziR_RFD_lo
OilCrop_ZiyaHe_IRR_hi
OilCrop_ZiyaHe_IRR_lo
OilCrop_ZiyaHe_RFD_hi
OilCrop_ZiyaHe_RFD_lo
OilCropTree_AdrBlkSea_IRR_hi
OilCropTree_AdrBlkSea_IRR_lo
OilCropTree_AdrBlkSea_RFD_hi
OilCropTree_AdrBlkSea_RFD_lo
OilCropTree_AfrCstE_IRR_hi
OilCropTree_AfrCstE_IRR_lo
OilCropTree_AfrCstE_RFD_hi
OilCropTree_AfrCstE_RFD_lo
OilCropTree_AfrCstNE_IRR_hi
OilCropTree_AfrCstNE_IRR_lo
OilCropTree_AfrCstNE_RFD_hi
OilCropTree_AfrCstNE_RFD_lo
OilCropTree_AfrCstNW_IRR_hi
OilCropTree_AfrCstNW_IRR_lo
OilCropTree_AfrCstNW_RFD_hi
OilCropTree_AfrCstNW_RFD_lo
OilCropTree_AfrCstS_RFD_hi
OilCropTree_AfrCstS_RFD_lo
OilCropTree_AfrCstSE_IRR_hi
OilCropTree_AfrCstSE_IRR_lo
OilCropTree_AfrCstSE_RFD_hi
OilCropTree_AfrCstSE_RFD_lo
OilCropTree_AfrCstW_IRR_hi
OilCropTree_AfrCstW_IRR_lo
OilCropTree_AfrCstW_RFD_hi
OilCropTree_AfrCstW_RFD_lo
OilCropTree_AfrIntN_IRR_hi
OilCropTree_AfrIntN_IRR_lo
OilCropTree_AfrIntN_RFD_hi
OilCropTree_AfrIntN_RFD_lo
OilCropTree_AmazonR_IRR_hi
OilCropTree_AmazonR_IRR_lo
OilCropTree_AmazonR_RFD_hi
OilCropTree_AmazonR_RFD_lo
OilCropTree_AmuDaryaR_IRR_hi
OilCropTree_AmuDaryaR_IRR_lo
OilCropTree_AmuDaryaR_RFD_hi
OilCropTree_AmuDaryaR_RFD_lo
OilCropTree_AmurR_IRR_hi
OilCropTree_AmurR_IRR_lo
OilCropTree_AmurR_RFD_hi
OilCropTree_AmurR_RFD_lo
OilCropTree_ArabianP_IRR_hi
OilCropTree_ArabianP_IRR_lo
OilCropTree_ArabianP_RFD_hi
OilCropTree_ArabianP_RFD_lo
OilCropTree_ArabianSea_IRR_hi
OilCropTree_ArabianSea_IRR_lo
OilCropTree_ArabianSea_RFD_hi
OilCropTree_ArabianSea_RFD_lo
OilCropTree_ArgColoR_IRR_hi
OilCropTree_ArgColoR_IRR_lo
OilCropTree_ArgColoR_RFD_hi
OilCropTree_ArgColoR_RFD_lo

OilCropTree_ArgCstN_IRR_hi
OilCropTree_ArgCstN_IRR_lo
OilCropTree_ArgCstN_RFD_hi
OilCropTree_ArgCstN_RFD_lo
OilCropTree_ArgCstS_IRR_hi
OilCropTree_ArgCstS_IRR_lo
OilCropTree_ArgCstS_RFD_hi
OilCropTree_ArgCstS_RFD_lo
OilCropTree_AusCstE_IRR_hi
OilCropTree_AusCstE_IRR_lo
OilCropTree_AusCstE_RFD_hi
OilCropTree_AusCstE_RFD_lo
OilCropTree_AusCstS_IRR_hi
OilCropTree_AusCstS_IRR_lo
OilCropTree_AusCstW_IRR_hi
OilCropTree_AusCstW_IRR_lo
OilCropTree_AusInt_IRR_hi
OilCropTree_AusInt_IRR_lo
OilCropTree_AusInt_RFD_hi
OilCropTree_AusInt_RFD_lo
OilCropTree_BengalBay_IRR_hi
OilCropTree_BengalBay_IRR_lo
OilCropTree_BengalBay_RFD_hi
OilCropTree_BengalBay_RFD_lo
OilCropTree_BengalW_IRR_hi
OilCropTree_BengalW_IRR_lo
OilCropTree_BengalW_RFD_hi
OilCropTree_BengalW_RFD_lo
OilCropTree_BlackSeaS_IRR_hi
OilCropTree_BlackSeaS_IRR_lo
OilCropTree_BlackSeaS_RFD_hi
OilCropTree_BlackSeaS_RFD_lo
OilCropTree_BoHai_IRR_hi
OilCropTree_BoHai_IRR_lo
OilCropTree_BoHai_RFD_hi
OilCropTree_BoHai_RFD_lo
OilCropTree_BorneoCstN_IRR_hi
OilCropTree_BorneoCstN_IRR_lo
OilCropTree_BorneoCstN_RFD_hi
OilCropTree_BorneoCstN_RFD_lo
OilCropTree_BrahmaniR_IRR_hi
OilCropTree_BrahmaniR_IRR_lo
OilCropTree_BrahmaniR_RFD_hi
OilCropTree_BrahmaniR_RFD_lo
OilCropTree_BrzCstE_IRR_hi
OilCropTree_BrzCstE_IRR_lo
OilCropTree_BrzCstE_RFD_hi
OilCropTree_BrzCstE_RFD_lo
OilCropTree_BrzCstN_IRR_hi
OilCropTree_BrzCstN_IRR_lo
OilCropTree_BrzCstN_RFD_hi
OilCropTree_BrzCstN_RFD_lo
OilCropTree_BrzCstS_IRR_hi
OilCropTree_BrzCstS_IRR_lo
OilCropTree_BrzCstS_RFD_hi
OilCropTree_BrzCstS_RFD_lo
OilCropTree_California_IRR_hi
OilCropTree_California_IRR_lo
OilCropTree_California_RFD_hi
OilCropTree_California_RFD_lo
OilCropTree_Caribbean_IRR_hi
OilCropTree_Caribbean_IRR_lo
OilCropTree_Caribbean_RFD_hi
OilCropTree_Caribbean_RFD_lo
OilCropTree_CaspianE_IRR_hi
OilCropTree_CaspianE_IRR_lo
OilCropTree_CaspianNE_IRR_hi
OilCropTree_CaspianNE_IRR_lo
OilCropTree_CaspianNE_RFD_hi
OilCropTree_CaspianNE_RFD_lo
OilCropTree_CaspianSW_IRR_hi
OilCropTree_CaspianSW_IRR_lo
OilCropTree_CaspianSW_RFD_hi
OilCropTree_CaspianSW_RFD_lo
OilCropTree_CauveryR_IRR_hi
OilCropTree_CauveryR_IRR_lo
OilCropTree_CauveryR_RFD_hi
OilCropTree_CauveryR_RFD_lo
OilCropTree_ChaoPhrR_IRR_hi
OilCropTree_ChaoPhrR_IRR_lo
OilCropTree_ChaoPhrR_RFD_hi
OilCropTree_ChaoPhrR_RFD_lo
OilCropTree_ChileCstN_IRR_hi
OilCropTree_ChileCstN_IRR_lo
OilCropTree_ChileCstS_IRR_hi
OilCropTree_ChileCstS_IRR_lo
OilCropTree_ChileCstS_RFD_hi
OilCropTree_ChileCstS_RFD_lo
OilCropTree_ChinaCst_IRR_hi
OilCropTree_ChinaCst_IRR_lo
OilCropTree_ChinaCst_RFD_hi
OilCropTree_ChinaCst_RFD_lo
OilCropTree_CntAmer_IRR_hi
OilCropTree_CntAmer_IRR_lo
OilCropTree_CntAmer_RFD_hi
OilCropTree_CntAmer_RFD_lo

OilCropTree_ColEcuaCst_IRR_hi
OilCropTree_ColEcuaCst_IRR_lo
OilCropTree_ColEcuaCst_RFD_hi
OilCropTree_ColEcuaCst_RFD_lo
OilCropTree_CongoR_IRR_hi
OilCropTree_CongoR_IRR_lo
OilCropTree_CongoR_RFD_hi
OilCropTree_CongoR_RFD_lo
OilCropTree_DanubeR_IRR_hi
OilCropTree_DanubeR_IRR_lo
OilCropTree_DanubeR_RFD_hi
OilCropTree_DanubeR_RFD_lo
OilCropTree_DeadSea_IRR_hi
OilCropTree_DeadSea_IRR_lo
OilCropTree_DeadSea_RFD_hi
OilCropTree_DeadSea_RFD_lo
OilCropTree_DouroR_IRR_hi
OilCropTree_DouroR_IRR_lo
OilCropTree_DouroR_RFD_hi
OilCropTree_DouroR_RFD_lo
OilCropTree_EbroR_IRR_hi
OilCropTree_EbroR_IRR_lo
OilCropTree_EbroR_RFD_hi
OilCropTree_EbroR_RFD_lo
OilCropTree_EJrdnSyr_IRR_hi
OilCropTree_EJrdnSyr_IRR_lo
OilCropTree_EJrdnSyr_RFD_hi
OilCropTree_EJrdnSyr_RFD_lo
OilCropTree_FarahrudR_IRR_hi
OilCropTree_FarahrudR_IRR_lo
OilCropTree_FlyR_RFD_hi
OilCropTree_FlyR_RFD_lo
OilCropTree_FranceCstS_IRR_hi
OilCropTree_FranceCstS_IRR_lo
OilCropTree_FranceCstS_RFD_hi
OilCropTree_FranceCstS_RFD_lo
OilCropTree_FranceCstW_RFD_hi
OilCropTree_FranceCstW_RFD_lo
OilCropTree_GangesR_IRR_hi
OilCropTree_GangesR_IRR_lo
OilCropTree_GangesR_RFD_hi
OilCropTree_GangesR_RFD_lo
OilCropTree_Gironde_IRR_hi
OilCropTree_Gironde_IRR_lo
OilCropTree_Gironde_RFD_hi
OilCropTree_Gironde_RFD_lo
OilCropTree_Gobi_IRR_hi
OilCropTree_Gobi_IRR_lo
OilCropTree_Gobi_RFD_hi
OilCropTree_Gobi_RFD_lo
OilCropTree_GodavariR_IRR_hi
OilCropTree_GodavariR_IRR_lo
OilCropTree_GodavariR_RFD_hi
OilCropTree_GodavariR_RFD_lo
OilCropTree_GrijUsuR_IRR_hi
OilCropTree_GrijUsuR_IRR_lo
OilCropTree_GrijUsuR_RFD_hi
OilCropTree_GrijUsuR_RFD_lo
OilCropTree_GuadalqR_IRR_hi
OilCropTree_GuadalqR_IRR_lo
OilCropTree_GuadalqR_RFD_hi
OilCropTree_GuadalqR_RFD_lo
OilCropTree_GuadianaR_IRR_hi
OilCropTree_GuadianaR_IRR_lo
OilCropTree_GuadianaR_RFD_hi
OilCropTree_GuadianaR_RFD_lo
OilCropTree_GuineaGulf_IRR_hi
OilCropTree_GuineaGulf_IRR_lo
OilCropTree_GuineaGulf_RFD_hi
OilCropTree_GuineaGulf_RFD_lo
OilCropTree_Hainan_IRR_hi
OilCropTree_Hainan_IRR_lo
OilCropTree_Hainan_RFD_hi
OilCropTree_Hainan_RFD_lo
OilCropTree_HamuMashR_IRR_hi
OilCropTree_HamuMashR_IRR_lo
OilCropTree_HamuMashR_RFD_hi
OilCropTree_HamuMashR_RFD_lo
OilCropTree_Helmand_IRR_hi
OilCropTree_Helmand_IRR_lo
OilCropTree_Hong_IRR_hi
OilCropTree_Hong_IRR_lo
OilCropTree_Hong_RFD_hi
OilCropTree_Hong_RFD_lo
OilCropTree_HuangHeR_IRR_hi
OilCropTree_HuangHeR_IRR_lo
OilCropTree_HuangHeR_RFD_hi
OilCropTree_HuangHeR_RFD_lo
OilCropTree_IberiaCst_IRR_hi
OilCropTree_IberiaCst_IRR_lo
OilCropTree_IberiaCst_RFD_hi
OilCropTree_IberiaCst_RFD_lo
OilCropTree_IdnE_RFD_hi
OilCropTree_IdnE_RFD_lo
OilCropTree_IndCstE_IRR_hi
OilCropTree_IndCstE_IRR_lo

OilCropTree_IndCstE_RFD_hi
OilCropTree_IndCstE_RFD_lo
OilCropTree_IndCstNE_IRR_hi
OilCropTree_IndCstNE_IRR_lo
OilCropTree_IndCstNE_RFD_hi
OilCropTree_IndCstNE_RFD_lo
OilCropTree_IndCstS_IRR_hi
OilCropTree_IndCstS_IRR_lo
OilCropTree_IndCstS_RFD_hi
OilCropTree_IndCstS_RFD_lo
OilCropTree_IndCstW_IRR_hi
OilCropTree_IndCstW_IRR_lo
OilCropTree_IndCstW_RFD_hi
OilCropTree_IndCstW_RFD_lo
OilCropTree_IndusR_IRR_hi
OilCropTree_IndusR_IRR_lo
OilCropTree_IndusR_RFD_hi
OilCropTree_IndusR_RFD_lo
OilCropTree_Iran_IRR_hi
OilCropTree_Iran_IRR_lo
OilCropTree_IrianJaya_RFD_hi
OilCropTree_IrianJaya_RFD_lo
OilCropTree_IrrawaddyR_IRR_hi
OilCropTree_IrrawaddyR_IRR_lo
OilCropTree_IrrawaddyR_RFD_hi
OilCropTree_IrrawaddyR_RFD_lo
OilCropTree_ItalyCstE_IRR_hi
OilCropTree_ItalyCstE_IRR_lo
OilCropTree_ItalyCstE_RFD_hi
OilCropTree_ItalyCstE_RFD_lo
OilCropTree_ItalyCstW_IRR_hi
OilCropTree_ItalyCstW_IRR_lo
OilCropTree_ItalyCstW_RFD_hi
OilCropTree_ItalyCstW_RFD_lo
OilCropTree_JavaTimor_RFD_hi
OilCropTree_JavaTimor_RFD_lo
OilCropTree_Kalimantan_RFD_hi
OilCropTree_Kalimantan_RFD_lo
OilCropTree_KrishnaR_IRR_hi
OilCropTree_KrishnaR_IRR_lo
OilCropTree_KrishnaR_RFD_hi
OilCropTree_KrishnaR_RFD_lo
OilCropTree_LaPuna_IRR_hi
OilCropTree_LaPuna_IRR_lo
OilCropTree_LaPuna_RFD_hi
OilCropTree_LaPuna_RFD_lo
OilCropTree_LBalkash_IRR_hi
OilCropTree_LBalkash_IRR_lo
OilCropTree_LBalkash_RFD_hi
OilCropTree_LBalkash_RFD_lo
OilCropTree_LChad_IRR_hi
OilCropTree_LChad_IRR_lo
OilCropTree_LChad_RFD_hi
OilCropTree_LChad_RFD_lo
OilCropTree_LimpopoR_RFD_hi
OilCropTree_LimpopoR_RFD_lo
OilCropTree_LoireR_IRR_hi
OilCropTree_LoireR_IRR_lo
OilCropTree_LoireR_RFD_hi
OilCropTree_LoireR_RFD_lo
OilCropTree_Madagascar_RFD_hi
OilCropTree_Madagascar_RFD_lo
OilCropTree_MagdalenaR_IRR_hi
OilCropTree_MagdalenaR_IRR_lo
OilCropTree_MagdalenaR_RFD_hi
OilCropTree_MagdalenaR_RFD_lo
OilCropTree_MahanadiR_IRR_hi
OilCropTree_MahanadiR_IRR_lo
OilCropTree_MahanadiR_RFD_hi
OilCropTree_MahanadiR_RFD_lo
OilCropTree_MahiR_IRR_hi
OilCropTree_MahiR_IRR_lo
OilCropTree_MahiR_RFD_hi
OilCropTree_MahiR_RFD_lo
OilCropTree_MalaysiaP_IRR_hi
OilCropTree_MalaysiaP_IRR_lo
OilCropTree_MalaysiaP_RFD_hi
OilCropTree_MalaysiaP_RFD_lo
OilCropTree_MarChiq_IRR_hi
OilCropTree_MarChiq_IRR_lo
OilCropTree_MarChiq_RFD_hi
OilCropTree_MarChiq_RFD_lo
OilCropTree_MeditE_IRR_hi
OilCropTree_MeditE_IRR_lo
OilCropTree_MeditE_RFD_hi
OilCropTree_MeditE_RFD_lo
OilCropTree_MeditIsl_IRR_hi
OilCropTree_MeditIsl_IRR_lo
OilCropTree_MeditIsl_RFD_hi
OilCropTree_MeditIsl_RFD_lo
OilCropTree_MeditS_IRR_hi
OilCropTree_MeditS_IRR_lo
OilCropTree_MeditS_RFD_hi
OilCropTree_MeditS_RFD_lo
OilCropTree_Mekong_IRR_hi
OilCropTree_Mekong_IRR_lo

OilCropTree_Mekong_RFD_hi
OilCropTree_Mekong_RFD_lo
OilCropTree_MexBaja_IRR_hi
OilCropTree_MexBaja_IRR_lo
OilCropTree_MexBaja_RFD_hi
OilCropTree_MexBaja_RFD_lo
OilCropTree_MexCstNW_IRR_hi
OilCropTree_MexCstNW_IRR_lo
OilCropTree_MexCstNW_RFD_hi
OilCropTree_MexCstNW_RFD_lo
OilCropTree_MexCstW_IRR_hi
OilCropTree_MexCstW_IRR_lo
OilCropTree_MexCstW_RFD_hi
OilCropTree_MexCstW_RFD_lo
OilCropTree_MexGulf_IRR_hi
OilCropTree_MexGulf_IRR_lo
OilCropTree_MexGulf_RFD_hi
OilCropTree_MexGulf_RFD_lo
OilCropTree_MexInt_IRR_hi
OilCropTree_MexInt_IRR_lo
OilCropTree_MexInt_RFD_hi
OilCropTree_MexInt_RFD_lo
OilCropTree_MurrayDrlg_IRR_hi
OilCropTree_MurrayDrlg_IRR_lo
OilCropTree_MurrayDrlg_RFD_hi
OilCropTree_MurrayDrlg_RFD_lo
OilCropTree_NarmadaR_IRR_hi
OilCropTree_NarmadaR_IRR_lo
OilCropTree_NarmadaR_RFD_hi
OilCropTree_NarmadaR_RFD_lo
OilCropTree_NegroR_IRR_hi
OilCropTree_NegroR_IRR_lo
OilCropTree_NegroR_RFD_hi
OilCropTree_NegroR_RFD_lo
OilCropTree_NewCaledn_RFD_hi
OilCropTree_NewCaledn_RFD_lo
OilCropTree_NigerR_IRR_hi
OilCropTree_NigerR_IRR_lo
OilCropTree_NigerR_RFD_hi
OilCropTree_NigerR_RFD_lo
OilCropTree_NileR_IRR_hi
OilCropTree_NileR_IRR_lo
OilCropTree_NileR_RFD_hi
OilCropTree_NileR_RFD_lo
OilCropTree_ObR_IRR_hi
OilCropTree_ObR_IRR_lo
OilCropTree_ObR_RFD_hi
OilCropTree_ObR_RFD_lo
OilCropTree_OrinocoR_IRR_hi
OilCropTree_OrinocoR_IRR_lo
OilCropTree_OrinocoR_RFD_hi
OilCropTree_OrinocoR_RFD_lo
OilCropTree_Pampas_IRR_hi
OilCropTree_Pampas_IRR_lo
OilCropTree_Pampas_RFD_hi
OilCropTree_Pampas_RFD_lo
OilCropTree_Papaloapan_IRR_hi
OilCropTree_Papaloapan_IRR_lo
OilCropTree_Papaloapan_RFD_hi
OilCropTree_Papaloapan_RFD_lo
OilCropTree_PapuaCst_RFD_hi
OilCropTree_PapuaCst_RFD_lo
OilCropTree_ParnaibaR_IRR_hi
OilCropTree_ParnaibaR_IRR_lo
OilCropTree_ParnaibaR_RFD_hi
OilCropTree_ParnaibaR_RFD_lo
OilCropTree_Patagonia_IRR_hi
OilCropTree_Patagonia_IRR_lo
OilCropTree_Patagonia_RFD_hi
OilCropTree_Patagonia_RFD_lo
OilCropTree_PennarR_IRR_hi
OilCropTree_PennarR_IRR_lo
OilCropTree_PennarR_RFD_hi
OilCropTree_PennarR_RFD_lo
OilCropTree_PersianGulf_IRR_hi
OilCropTree_PersianGulf_IRR_lo
OilCropTree_PeruCst_IRR_hi
OilCropTree_PeruCst_IRR_lo
OilCropTree_PeruCst_RFD_hi
OilCropTree_PeruCst_RFD_lo
OilCropTree_Phlppns_RFD_hi
OilCropTree_Phlppns_RFD_lo
OilCropTree_PoR_IRR_hi
OilCropTree_PoR_IRR_lo
OilCropTree_PoR_RFD_hi
OilCropTree_PoR_RFD_lo
OilCropTree_RedSeaE_IRR_hi
OilCropTree_RedSeaE_IRR_lo
OilCropTree_RhoneR_IRR_hi
OilCropTree_RhoneR_IRR_lo
OilCropTree_RhoneR_RFD_hi
OilCropTree_RhoneR_RFD_lo
OilCropTree_RiftValley_IRR_hi
OilCropTree_RiftValley_IRR_lo
OilCropTree_RiftValley_RFD_hi
OilCropTree_RiftValley_RFD_lo

OilCropTree_RioBalsas_IRR_hi
OilCropTree_RioBalsas_IRR_lo
OilCropTree_RioBalsas_RFD_hi
OilCropTree_RioBalsas_RFD_lo
OilCropTree_RioLaPlata_IRR_hi
OilCropTree_RioLaPlata_IRR_lo
OilCropTree_RioLaPlata_RFD_hi
OilCropTree_RioLaPlata_RFD_lo
OilCropTree_RioLerma_IRR_hi
OilCropTree_RioLerma_IRR_lo
OilCropTree_RioLerma_RFD_hi
OilCropTree_RioLerma_RFD_lo
OilCropTree_RioVerde_IRR_hi
OilCropTree_RioVerde_IRR_lo
OilCropTree_RioVerde_RFD_hi
OilCropTree_RioVerde_RFD_lo
OilCropTree_RusCstSE_IRR_hi
OilCropTree_RusCstSE_IRR_lo
OilCropTree_RusCstSE_RFD_hi
OilCropTree_RusCstSE_RFD_lo
OilCropTree_SabarmatiR_IRR_hi
OilCropTree_SabarmatiR_IRR_lo
OilCropTree_SabarmatiR_RFD_hi
OilCropTree_SabarmatiR_RFD_lo
OilCropTree_Salinas_IRR_hi
OilCropTree_Salinas_IRR_lo
OilCropTree_Salinas_RFD_hi
OilCropTree_Salinas_RFD_lo
OilCropTree_Salween_IRR_hi
OilCropTree_Salween_IRR_lo
OilCropTree_Salween_RFD_hi
OilCropTree_Salween_RFD_lo
OilCropTree_SAmerCstN_IRR_hi
OilCropTree_SAmerCstN_IRR_lo
OilCropTree_SAmerCstN_RFD_hi
OilCropTree_SAmerCstN_RFD_lo
OilCropTree_SAmerCstNE_IRR_hi
OilCropTree_SAmerCstNE_IRR_lo
OilCropTree_SAmerCstNE_RFD_hi
OilCropTree_SAmerCstNE_RFD_lo
OilCropTree_SaoFrancR_IRR_hi
OilCropTree_SaoFrancR_IRR_lo
OilCropTree_SaoFrancR_RFD_hi
OilCropTree_SaoFrancR_RFD_lo
OilCropTree_SChinaSea_IRR_hi
OilCropTree_SChinaSea_IRR_lo
OilCropTree_SChinaSea_RFD_hi
OilCropTree_SChinaSea_RFD_lo
OilCropTree_SenegalR_IRR_hi
OilCropTree_SenegalR_IRR_lo
OilCropTree_SenegalR_RFD_hi
OilCropTree_SenegalR_RFD_lo
OilCropTree_SepikR_RFD_hi
OilCropTree_SepikR_RFD_lo
OilCropTree_ShebJubR_IRR_hi
OilCropTree_ShebJubR_IRR_lo
OilCropTree_ShebJubR_RFD_hi
OilCropTree_ShebJubR_RFD_lo
OilCropTree_SinaiP_IRR_hi
OilCropTree_SinaiP_IRR_lo
OilCropTree_SinaiP_RFD_hi
OilCropTree_SinaiP_RFD_lo
OilCropTree_SittaungR_IRR_hi
OilCropTree_SittaungR_IRR_lo
OilCropTree_SittaungR_RFD_hi
OilCropTree_SittaungR_RFD_lo
OilCropTree_SolomonIsl_RFD_hi
OilCropTree_SolomonIsl_RFD_lo
OilCropTree_SpainCstSE_IRR_hi
OilCropTree_SpainCstSE_IRR_lo
OilCropTree_SpainCstSE_RFD_hi
OilCropTree_SpainCstSE_RFD_lo
OilCropTree_SriLanka_RFD_hi
OilCropTree_SriLanka_RFD_lo
OilCropTree_Sulawesi_RFD_hi
OilCropTree_Sulawesi_RFD_lo
OilCropTree_Sumatra_RFD_hi
OilCropTree_Sumatra_RFD_lo
OilCropTree_SyrDaryaR_IRR_hi
OilCropTree_SyrDaryaR_IRR_lo
OilCropTree_SyrDaryaR_RFD_hi
OilCropTree_SyrDaryaR_RFD_lo
OilCropTree_TagusR_IRR_hi
OilCropTree_TagusR_IRR_lo
OilCropTree_TagusR_RFD_hi
OilCropTree_TagusR_RFD_lo
OilCropTree_Taiwan_RFD_hi
OilCropTree_Taiwan_RFD_lo
OilCropTree_TaptiR_IRR_hi
OilCropTree_TaptiR_IRR_lo
OilCropTree_TaptiR_RFD_hi
OilCropTree_TaptiR_RFD_lo
OilCropTree_Tarim_IRR_hi
OilCropTree_Tarim_IRR_lo
OilCropTree_Tarim_RFD_hi
OilCropTree_Tarim_RFD_lo

OilCropTree_Tasmania_IRR_hi
OilCropTree_Tasmania_IRR_lo
OilCropTree_Tasmania_RFD_hi
OilCropTree_Tasmania_RFD_lo
OilCropTree_Tehuantpc_IRR_hi
OilCropTree_Tehuantpc_IRR_lo
OilCropTree_Tehuantpc_RFD_hi
OilCropTree_Tehuantpc_RFD_lo
OilCropTree_ThaiGulf_IRR_hi
OilCropTree_ThaiGulf_IRR_lo
OilCropTree_ThaiGulf_RFD_hi
OilCropTree_ThaiGulf_RFD_lo
OilCropTree_TiberR_IRR_hi
OilCropTree_TiberR_IRR_lo
OilCropTree_TiberR_RFD_hi
OilCropTree_TiberR_RFD_lo
OilCropTree_TigrEuphR_IRR_hi
OilCropTree_TigrEuphR_IRR_lo
OilCropTree_TigrEuphR_RFD_hi
OilCropTree_TigrEuphR_RFD_lo
OilCropTree_TocantinsR_IRR_hi
OilCropTree_TocantinsR_IRR_lo
OilCropTree_TocantinsR_RFD_hi
OilCropTree_TocantinsR_RFD_lo
OilCropTree_UsaColoRS_IRR_hi
OilCropTree_UsaColoRS_IRR_lo
OilCropTree_UsaColoRS_RFD_hi
OilCropTree_UsaColoRS_RFD_lo
OilCropTree_VietnamCst_IRR_hi
OilCropTree_VietnamCst_IRR_lo
OilCropTree_VietnamCst_RFD_hi
OilCropTree_VietnamCst_RFD_lo
OilCropTree_VoltaR_IRR_hi
OilCropTree_VoltaR_IRR_lo
OilCropTree_VoltaR_RFD_hi
OilCropTree_VoltaR_RFD_lo
OilCropTree_XunJiang_IRR_hi
OilCropTree_XunJiang_IRR_lo
OilCropTree_XunJiang_RFD_hi
OilCropTree_XunJiang_RFD_lo
OilCropTree_Yangtze_IRR_hi
OilCropTree_Yangtze_IRR_lo
OilCropTree_Yangtze_RFD_hi
OilCropTree_Yangtze_RFD_lo
OilCropTree_YucatanP_IRR_hi
OilCropTree_YucatanP_IRR_lo
OilCropTree_YucatanP_RFD_hi
OilCropTree_YucatanP_RFD_lo
OilCropTree_ZambeziR_IRR_hi
OilCropTree_ZambeziR_IRR_lo
OilCropTree_ZambeziR_RFD_hi
OilCropTree_ZambeziR_RFD_lo
OilCropTree_ZiyaHe_IRR_hi
OilCropTree_ZiyaHe_IRR_lo
OilCropTree_ZiyaHe_RFD_hi
OilCropTree_ZiyaHe_RFD_lo
OilPalmTree_AfrCstE_RFD_hi
OilPalmTree_AfrCstE_RFD_lo
OilPalmTree_AfrCstW_IRR_hi
OilPalmTree_AfrCstW_IRR_lo
OilPalmTree_AfrCstW_RFD_hi
OilPalmTree_AfrCstW_RFD_lo
OilPalmTree_AfrIntS_RFD_hi
OilPalmTree_AfrIntS_RFD_lo
OilPalmTree_AmazonR_RFD_hi
OilPalmTree_AmazonR_RFD_lo
OilPalmTree_AmurR_RFD_hi
OilPalmTree_AmurR_RFD_lo
OilPalmTree_AngolaCst_RFD_hi
OilPalmTree_AngolaCst_RFD_lo
OilPalmTree_BoHai_RFD_hi
OilPalmTree_BoHai_RFD_lo
OilPalmTree_BorneoCstN_RFD_hi
OilPalmTree_BorneoCstN_RFD_lo
OilPalmTree_BrzCstN_RFD_hi
OilPalmTree_BrzCstN_RFD_lo
OilPalmTree_BrzCstS_RFD_hi
OilPalmTree_BrzCstS_RFD_lo
OilPalmTree_Caribbean_RFD_hi
OilPalmTree_Caribbean_RFD_lo
OilPalmTree_ChaoPhrR_RFD_hi
OilPalmTree_ChaoPhrR_RFD_lo
OilPalmTree_ChinaCst_RFD_hi
OilPalmTree_ChinaCst_RFD_lo
OilPalmTree_CntAmer_RFD_hi
OilPalmTree_CntAmer_RFD_lo
OilPalmTree_ColEcuaCst_RFD_hi
OilPalmTree_ColEcuaCst_RFD_lo
OilPalmTree_CongoR_RFD_hi
OilPalmTree_CongoR_RFD_lo
OilPalmTree_FlyR_RFD_hi
OilPalmTree_FlyR_RFD_lo
OilPalmTree_GangesR_RFD_hi
OilPalmTree_GangesR_RFD_lo
OilPalmTree_Gobi_RFD_hi
OilPalmTree_Gobi_RFD_lo

OilPalmTree_GrijUsuR_RFD_hi
OilPalmTree_GrijUsuR_RFD_lo
OilPalmTree_GuineaGulf_IRR_hi
OilPalmTree_GuineaGulf_IRR_lo
OilPalmTree_GuineaGulf_RFD_hi
OilPalmTree_GuineaGulf_RFD_lo
OilPalmTree_Hainan_RFD_hi
OilPalmTree_Hainan_RFD_lo
OilPalmTree_Hong_RFD_hi
OilPalmTree_Hong_RFD_lo
OilPalmTree_HuangHeR_RFD_hi
OilPalmTree_HuangHeR_RFD_lo
OilPalmTree_IrianJaya_RFD_hi
OilPalmTree_IrianJaya_RFD_lo
OilPalmTree_IrrawaddyR_RFD_hi
OilPalmTree_IrrawaddyR_RFD_lo
OilPalmTree_JavaTimor_RFD_hi
OilPalmTree_JavaTimor_RFD_lo
OilPalmTree_Kalimantan_RFD_hi
OilPalmTree_Kalimantan_RFD_lo
OilPalmTree_LaPuna_RFD_hi
OilPalmTree_LaPuna_RFD_lo
OilPalmTree_LBalkash_RFD_hi
OilPalmTree_LBalkash_RFD_lo
OilPalmTree_LChad_RFD_hi
OilPalmTree_LChad_RFD_lo
OilPalmTree_Madagascar_RFD_hi
OilPalmTree_Madagascar_RFD_lo
OilPalmTree_MagdalenaR_RFD_hi
OilPalmTree_MagdalenaR_RFD_lo
OilPalmTree_MalaysiaP_RFD_hi
OilPalmTree_MalaysiaP_RFD_lo
OilPalmTree_Mekong_RFD_hi
OilPalmTree_Mekong_RFD_lo
OilPalmTree_NewCaledn_RFD_hi
OilPalmTree_NewCaledn_RFD_lo
OilPalmTree_NigerR_IRR_hi
OilPalmTree_NigerR_IRR_lo
OilPalmTree_NigerR_RFD_hi
OilPalmTree_NigerR_RFD_lo
OilPalmTree_NileR_RFD_hi
OilPalmTree_NileR_RFD_lo
OilPalmTree_ObR_RFD_hi
OilPalmTree_ObR_RFD_lo
OilPalmTree_OrinocoR_RFD_hi
OilPalmTree_OrinocoR_RFD_lo
OilPalmTree_Papaloapan_RFD_hi
OilPalmTree_Papaloapan_RFD_lo
OilPalmTree_PapuaCst_RFD_hi
OilPalmTree_PapuaCst_RFD_lo
OilPalmTree_PeruCst_RFD_hi
OilPalmTree_PeruCst_RFD_lo
OilPalmTree_Phlppns_RFD_hi
OilPalmTree_Phlppns_RFD_lo
OilPalmTree_RiftValley_RFD_hi
OilPalmTree_RiftValley_RFD_lo
OilPalmTree_RioLaPlata_RFD_hi
OilPalmTree_RioLaPlata_RFD_lo
OilPalmTree_RusCstSE_RFD_hi
OilPalmTree_RusCstSE_RFD_lo
OilPalmTree_Salween_RFD_hi
OilPalmTree_Salween_RFD_lo
OilPalmTree_SAmerCstN_RFD_hi
OilPalmTree_SAmerCstN_RFD_lo
OilPalmTree_SAmerCstNE_RFD_hi
OilPalmTree_SAmerCstNE_RFD_lo
OilPalmTree_SChinaSea_RFD_hi
OilPalmTree_SChinaSea_RFD_lo
OilPalmTree_SenegalR_IRR_hi
OilPalmTree_SenegalR_IRR_lo
OilPalmTree_SenegalR_RFD_hi
OilPalmTree_SenegalR_RFD_lo
OilPalmTree_SepikR_RFD_hi
OilPalmTree_SepikR_RFD_lo
OilPalmTree_SolomonIsl_RFD_hi
OilPalmTree_SolomonIsl_RFD_lo
OilPalmTree_Sulawesi_RFD_hi
OilPalmTree_Sulawesi_RFD_lo
OilPalmTree_Sumatra_RFD_hi
OilPalmTree_Sumatra_RFD_lo
OilPalmTree_Tarim_RFD_hi
OilPalmTree_Tarim_RFD_lo
OilPalmTree_Tehuantpc_RFD_hi
OilPalmTree_Tehuantpc_RFD_lo
OilPalmTree_ThaiGulf_RFD_hi
OilPalmTree_ThaiGulf_RFD_lo
OilPalmTree_TocantinsR_RFD_hi
OilPalmTree_TocantinsR_RFD_lo
OilPalmTree_VietnamCst_RFD_hi
OilPalmTree_VietnamCst_RFD_lo
OilPalmTree_VoltaR_RFD_hi
OilPalmTree_VoltaR_RFD_lo
OilPalmTree_XunJiang_RFD_hi
OilPalmTree_XunJiang_RFD_lo
OilPalmTree_Yangtze_RFD_hi
OilPalmTree_Yangtze_RFD_lo

OilPalmTree_YucatanP_RFD_hi
OilPalmTree_YucatanP_RFD_lo
OilPalmTree_ZambeziR_RFD_hi
OilPalmTree_ZambeziR_RFD_lo
OilPalmTree_ZiyaHe_RFD_hi
OilPalmTree_ZiyaHe_RFD_lo
other industrial processes
OtherGrain_AdrBlkSea_IRR_hi
OtherGrain_AdrBlkSea_IRR_lo
OtherGrain_AdrBlkSea_RFD_hi
OtherGrain_AdrBlkSea_RFD_lo
OtherGrain_AfrCstE_IRR_hi
OtherGrain_AfrCstE_IRR_lo
OtherGrain_AfrCstE_RFD_hi
OtherGrain_AfrCstE_RFD_lo
OtherGrain_AfrCstNE_IRR_hi
OtherGrain_AfrCstNE_IRR_lo
OtherGrain_AfrCstNE_RFD_hi
OtherGrain_AfrCstNE_RFD_lo
OtherGrain_AfrCstNW_IRR_hi
OtherGrain_AfrCstNW_IRR_lo
OtherGrain_AfrCstNW_RFD_hi
OtherGrain_AfrCstNW_RFD_lo
OtherGrain_AfrCstS_IRR_hi
OtherGrain_AfrCstS_IRR_lo
OtherGrain_AfrCstS_RFD_hi
OtherGrain_AfrCstS_RFD_lo
OtherGrain_AfrCstSE_IRR_hi
OtherGrain_AfrCstSE_IRR_lo
OtherGrain_AfrCstSE_RFD_hi
OtherGrain_AfrCstSE_RFD_lo
OtherGrain_AfrCstSSW_IRR_hi
OtherGrain_AfrCstSSW_IRR_lo
OtherGrain_AfrCstSSW_RFD_hi
OtherGrain_AfrCstSSW_RFD_lo
OtherGrain_AfrCstW_IRR_hi
OtherGrain_AfrCstW_IRR_lo
OtherGrain_AfrCstW_RFD_hi
OtherGrain_AfrCstW_RFD_lo
OtherGrain_AfrIntN_IRR_hi
OtherGrain_AfrIntN_IRR_lo
OtherGrain_AfrIntN_RFD_hi
OtherGrain_AfrIntN_RFD_lo
OtherGrain_AfrIntS_IRR_hi
OtherGrain_AfrIntS_IRR_lo
OtherGrain_AfrIntS_RFD_hi
OtherGrain_AfrIntS_RFD_lo
OtherGrain_AmazonR_IRR_hi
OtherGrain_AmazonR_IRR_lo
OtherGrain_AmazonR_RFD_hi
OtherGrain_AmazonR_RFD_lo
OtherGrain_AmuDaryaR_IRR_hi
OtherGrain_AmuDaryaR_IRR_lo
OtherGrain_AmuDaryaR_RFD_hi
OtherGrain_AmuDaryaR_RFD_lo
OtherGrain_AmurR_IRR_hi
OtherGrain_AmurR_IRR_lo
OtherGrain_AmurR_RFD_hi
OtherGrain_AmurR_RFD_lo
OtherGrain_ArabianP_IRR_hi
OtherGrain_ArabianP_IRR_lo
OtherGrain_ArabianP_RFD_hi
OtherGrain_ArabianP_RFD_lo
OtherGrain_ArabianSea_IRR_hi
OtherGrain_ArabianSea_IRR_lo
OtherGrain_ArabianSea_RFD_hi
OtherGrain_ArabianSea_RFD_lo
OtherGrain_ArgColoR_IRR_hi
OtherGrain_ArgColoR_IRR_lo
OtherGrain_ArgColoR_RFD_hi
OtherGrain_ArgColoR_RFD_lo
OtherGrain_ArgCstN_IRR_hi
OtherGrain_ArgCstN_IRR_lo
OtherGrain_ArgCstN_RFD_hi
OtherGrain_ArgCstN_RFD_lo
OtherGrain_ArgCstS_IRR_hi
OtherGrain_ArgCstS_IRR_lo
OtherGrain_ArgCstS_RFD_hi
OtherGrain_ArgCstS_RFD_lo
OtherGrain_ArkWhtRedR_IRR_hi
OtherGrain_ArkWhtRedR_IRR_lo
OtherGrain_ArkWhtRedR_RFD_hi
OtherGrain_ArkWhtRedR_RFD_lo
OtherGrain_AusCstE_IRR_hi
OtherGrain_AusCstE_IRR_lo
OtherGrain_AusCstE_RFD_hi
OtherGrain_AusCstE_RFD_lo
OtherGrain_AusCstN_RFD_hi
OtherGrain_AusCstN_RFD_lo
OtherGrain_AusCstS_IRR_hi
OtherGrain_AusCstS_IRR_lo
OtherGrain_AusCstS_RFD_hi
OtherGrain_AusCstS_RFD_lo
OtherGrain_AusCstW_IRR_hi
OtherGrain_AusCstW_IRR_lo
OtherGrain_AusCstW_RFD_hi

OtherGrain_AusCstW_RFD_lo
OtherGrain_AusInt_RFD_hi
OtherGrain_AusInt_RFD_lo
OtherGrain_BalticSea_IRR_hi
OtherGrain_BalticSea_IRR_lo
OtherGrain_BalticSea_RFD_hi
OtherGrain_BalticSea_RFD_lo
OtherGrain_BarentsSea_IRR_hi
OtherGrain_BarentsSea_IRR_lo
OtherGrain_BarentsSea_RFD_hi
OtherGrain_BarentsSea_RFD_lo
OtherGrain_BengalBay_IRR_hi
OtherGrain_BengalBay_IRR_lo
OtherGrain_BengalBay_RFD_hi
OtherGrain_BengalBay_RFD_lo
OtherGrain_BengalW_IRR_hi
OtherGrain_BengalW_IRR_lo
OtherGrain_BengalW_RFD_hi
OtherGrain_BengalW_RFD_lo
OtherGrain_BlackSeaN_IRR_hi
OtherGrain_BlackSeaN_IRR_lo
OtherGrain_BlackSeaN_RFD_hi
OtherGrain_BlackSeaN_RFD_lo
OtherGrain_BlackSeaS_IRR_hi
OtherGrain_BlackSeaS_IRR_lo
OtherGrain_BlackSeaS_RFD_hi
OtherGrain_BlackSeaS_RFD_lo
OtherGrain_BoHai_IRR_hi
OtherGrain_BoHai_IRR_lo
OtherGrain_BoHai_RFD_hi
OtherGrain_BoHai_RFD_lo
OtherGrain_BrahmaniR_IRR_hi
OtherGrain_BrahmaniR_IRR_lo
OtherGrain_BrahmaniR_RFD_hi
OtherGrain_BrahmaniR_RFD_lo
OtherGrain_BrzCstE_IRR_hi
OtherGrain_BrzCstE_IRR_lo
OtherGrain_BrzCstE_RFD_hi
OtherGrain_BrzCstE_RFD_lo
OtherGrain_BrzCstN_IRR_hi
OtherGrain_BrzCstN_IRR_lo
OtherGrain_BrzCstN_RFD_hi
OtherGrain_BrzCstN_RFD_lo
OtherGrain_BrzCstS_IRR_hi
OtherGrain_BrzCstS_IRR_lo
OtherGrain_BrzCstS_RFD_hi
OtherGrain_BrzCstS_RFD_lo
OtherGrain_California_IRR_hi
OtherGrain_California_IRR_lo
OtherGrain_California_RFD_hi
OtherGrain_California_RFD_lo
OtherGrain_CanAtl_IRR_hi
OtherGrain_CanAtl_IRR_lo
OtherGrain_CanAtl_RFD_hi
OtherGrain_CanAtl_RFD_lo
OtherGrain_CaspianE_IRR_hi
OtherGrain_CaspianE_IRR_lo
OtherGrain_CaspianE_RFD_hi
OtherGrain_CaspianE_RFD_lo
OtherGrain_CaspianNE_IRR_hi
OtherGrain_CaspianNE_IRR_lo
OtherGrain_CaspianNE_RFD_hi
OtherGrain_CaspianNE_RFD_lo
OtherGrain_CaspianSW_IRR_hi
OtherGrain_CaspianSW_IRR_lo
OtherGrain_CaspianSW_RFD_hi
OtherGrain_CaspianSW_RFD_lo
OtherGrain_ChaoPhrR_IRR_hi
OtherGrain_ChaoPhrR_IRR_lo
OtherGrain_ChaoPhrR_RFD_hi
OtherGrain_ChaoPhrR_RFD_lo
OtherGrain_ChileCstN_IRR_hi
OtherGrain_ChileCstN_IRR_lo
OtherGrain_ChileCstN_RFD_hi
OtherGrain_ChileCstN_RFD_lo
OtherGrain_ChileCstS_IRR_hi
OtherGrain_ChileCstS_IRR_lo
OtherGrain_ChileCstS_RFD_hi
OtherGrain_ChileCstS_RFD_lo
OtherGrain_ChinaCst_IRR_hi
OtherGrain_ChinaCst_IRR_lo
OtherGrain_ChinaCst_RFD_hi
OtherGrain_ChinaCst_RFD_lo
OtherGrain_CntAmer_RFD_hi
OtherGrain_CntAmer_RFD_lo
OtherGrain_ColEcuaCst_IRR_hi
OtherGrain_ColEcuaCst_IRR_lo
OtherGrain_ColEcuaCst_RFD_hi
OtherGrain_ColEcuaCst_RFD_lo
OtherGrain_CongoR_IRR_hi
OtherGrain_CongoR_IRR_lo
OtherGrain_CongoR_RFD_hi
OtherGrain_CongoR_RFD_lo
OtherGrain_DanubeR_IRR_hi
OtherGrain_DanubeR_IRR_lo
OtherGrain_DanubeR_RFD_hi

OtherGrain_DanubeR_RFD_lo
OtherGrain_DaugavaR_IRR_hi
OtherGrain_DaugavaR_IRR_lo
OtherGrain_DaugavaR_RFD_hi
OtherGrain_DaugavaR_RFD_lo
OtherGrain_DeadSea_IRR_hi
OtherGrain_DeadSea_IRR_lo
OtherGrain_DeadSea_RFD_hi
OtherGrain_DeadSea_RFD_lo
OtherGrain_DnieperR_IRR_hi
OtherGrain_DnieperR_IRR_lo
OtherGrain_DnieperR_RFD_hi
OtherGrain_DnieperR_RFD_lo
OtherGrain_DniesterR_IRR_hi
OtherGrain_DniesterR_IRR_lo
OtherGrain_DniesterR_RFD_hi
OtherGrain_DniesterR_RFD_lo
OtherGrain_DnkGrmCst_IRR_hi
OtherGrain_DnkGrmCst_IRR_lo
OtherGrain_DnkGrmCst_RFD_hi
OtherGrain_DnkGrmCst_RFD_lo
OtherGrain_DonR_IRR_hi
OtherGrain_DonR_IRR_lo
OtherGrain_DonR_RFD_hi
OtherGrain_DonR_RFD_lo
OtherGrain_DouroR_IRR_hi
OtherGrain_DouroR_IRR_lo
OtherGrain_DouroR_RFD_hi
OtherGrain_DouroR_RFD_lo
OtherGrain_DvinaRN_IRR_hi
OtherGrain_DvinaRN_IRR_lo
OtherGrain_DvinaRN_RFD_hi
OtherGrain_DvinaRN_RFD_lo
OtherGrain_EbroR_IRR_hi
OtherGrain_EbroR_IRR_lo
OtherGrain_EbroR_RFD_hi
OtherGrain_EbroR_RFD_lo
OtherGrain_EJrdnSyr_IRR_hi
OtherGrain_EJrdnSyr_IRR_lo
OtherGrain_EJrdnSyr_RFD_hi
OtherGrain_EJrdnSyr_RFD_lo
OtherGrain_ElbeR_IRR_hi
OtherGrain_ElbeR_IRR_lo
OtherGrain_ElbeR_RFD_hi
OtherGrain_ElbeR_RFD_lo
OtherGrain_EmsWeserR_IRR_hi
OtherGrain_EmsWeserR_IRR_lo
OtherGrain_EmsWeserR_RFD_hi
OtherGrain_EmsWeserR_RFD_lo
OtherGrain_EngWales_IRR_hi
OtherGrain_EngWales_IRR_lo
OtherGrain_EngWales_RFD_hi
OtherGrain_EngWales_RFD_lo
OtherGrain_FarahrudR_IRR_hi
OtherGrain_FarahrudR_IRR_lo
OtherGrain_FarahrudR_RFD_hi
OtherGrain_FarahrudR_RFD_lo
OtherGrain_Finland_IRR_hi
OtherGrain_Finland_IRR_lo
OtherGrain_Finland_RFD_hi
OtherGrain_Finland_RFD_lo
OtherGrain_FranceCstS_IRR_hi
OtherGrain_FranceCstS_IRR_lo
OtherGrain_FranceCstS_RFD_hi
OtherGrain_FranceCstS_RFD_lo
OtherGrain_FranceCstW_IRR_hi
OtherGrain_FranceCstW_IRR_lo
OtherGrain_FranceCstW_RFD_hi
OtherGrain_FranceCstW_RFD_lo
OtherGrain_FraserR_IRR_hi
OtherGrain_FraserR_IRR_lo
OtherGrain_FraserR_RFD_hi
OtherGrain_FraserR_RFD_lo
OtherGrain_GangesR_IRR_hi
OtherGrain_GangesR_IRR_lo
OtherGrain_GangesR_RFD_hi
OtherGrain_GangesR_RFD_lo
OtherGrain_Gironde_IRR_hi
OtherGrain_Gironde_IRR_lo
OtherGrain_Gironde_RFD_hi
OtherGrain_Gironde_RFD_lo
OtherGrain_Gobi_IRR_hi
OtherGrain_Gobi_IRR_lo
OtherGrain_Gobi_RFD_hi
OtherGrain_Gobi_RFD_lo
OtherGrain_GodavariR_IRR_hi
OtherGrain_GodavariR_IRR_lo
OtherGrain_GodavariR_RFD_hi
OtherGrain_GodavariR_RFD_lo
OtherGrain_GreatBasin_IRR_hi
OtherGrain_GreatBasin_IRR_lo
OtherGrain_GreatBasin_RFD_hi
OtherGrain_GreatBasin_RFD_lo
OtherGrain_GreatLakes_IRR_hi
OtherGrain_GreatLakes_IRR_lo
OtherGrain_GreatLakes_RFD_hi

OtherGrain_GreatLakes_RFD_lo
OtherGrain_GrijUsuR_RFD_hi
OtherGrain_GrijUsuR_RFD_lo
OtherGrain_GuadalqR_IRR_hi
OtherGrain_GuadalqR_IRR_lo
OtherGrain_GuadalqR_RFD_hi
OtherGrain_GuadalqR_RFD_lo
OtherGrain_GuadianaR_IRR_hi
OtherGrain_GuadianaR_IRR_lo
OtherGrain_GuadianaR_RFD_hi
OtherGrain_GuadianaR_RFD_lo
OtherGrain_GuineaGulf_RFD_hi
OtherGrain_GuineaGulf_RFD_lo
OtherGrain_Hainan_IRR_hi
OtherGrain_Hainan_IRR_lo
OtherGrain_Hainan_RFD_hi
OtherGrain_Hainan_RFD_lo
OtherGrain_HamuMashR_IRR_hi
OtherGrain_HamuMashR_IRR_lo
OtherGrain_HamuMashR_RFD_hi
OtherGrain_HamuMashR_RFD_lo
OtherGrain_Helmand_IRR_hi
OtherGrain_Helmand_IRR_lo
OtherGrain_Helmand_RFD_hi
OtherGrain_Helmand_RFD_lo
OtherGrain_Hong_IRR_hi
OtherGrain_Hong_IRR_lo
OtherGrain_Hong_RFD_hi
OtherGrain_Hong_RFD_lo
OtherGrain_HuangHeR_IRR_hi
OtherGrain_HuangHeR_IRR_lo
OtherGrain_HuangHeR_RFD_hi
OtherGrain_HuangHeR_RFD_lo
OtherGrain_HudsonBay_IRR_hi
OtherGrain_HudsonBay_IRR_lo
OtherGrain_HudsonBay_RFD_hi
OtherGrain_HudsonBay_RFD_lo
OtherGrain_IberiaCst_IRR_hi
OtherGrain_IberiaCst_IRR_lo
OtherGrain_IberiaCst_RFD_hi
OtherGrain_IberiaCst_RFD_lo
OtherGrain_IndusR_IRR_hi
OtherGrain_IndusR_IRR_lo
OtherGrain_IndusR_RFD_hi
OtherGrain_IndusR_RFD_lo
OtherGrain_Iran_IRR_hi
OtherGrain_Iran_IRR_lo
OtherGrain_Iran_RFD_hi
OtherGrain_Iran_RFD_lo
OtherGrain_Ireland_IRR_hi
OtherGrain_Ireland_IRR_lo
OtherGrain_Ireland_RFD_hi
OtherGrain_Ireland_RFD_lo
OtherGrain_IrrawaddyR_IRR_hi
OtherGrain_IrrawaddyR_IRR_lo
OtherGrain_IrrawaddyR_RFD_hi
OtherGrain_IrrawaddyR_RFD_lo
OtherGrain_ItalyCstE_IRR_hi
OtherGrain_ItalyCstE_IRR_lo
OtherGrain_ItalyCstE_RFD_hi
OtherGrain_ItalyCstE_RFD_lo
OtherGrain_ItalyCstW_IRR_hi
OtherGrain_ItalyCstW_IRR_lo
OtherGrain_ItalyCstW_RFD_hi
OtherGrain_ItalyCstW_RFD_lo
OtherGrain_Japan_IRR_hi
OtherGrain_Japan_IRR_lo
OtherGrain_Japan_RFD_hi
OtherGrain_Japan_RFD_lo
OtherGrain_Korea_IRR_hi
OtherGrain_Korea_IRR_lo
OtherGrain_Korea_RFD_hi
OtherGrain_Korea_RFD_lo
OtherGrain_LaPuna_IRR_hi
OtherGrain_LaPuna_IRR_lo
OtherGrain_LaPuna_RFD_hi
OtherGrain_LaPuna_RFD_lo
OtherGrain_LBalkash_IRR_hi
OtherGrain_LBalkash_IRR_lo
OtherGrain_LBalkash_RFD_hi
OtherGrain_LBalkash_RFD_lo
OtherGrain_LChad_IRR_hi
OtherGrain_LChad_IRR_lo
OtherGrain_LChad_RFD_hi
OtherGrain_LChad_RFD_lo
OtherGrain_LenaR_IRR_hi
OtherGrain_LenaR_IRR_lo
OtherGrain_LenaR_RFD_hi
OtherGrain_LenaR_RFD_lo
OtherGrain_LimpopoR_IRR_hi
OtherGrain_LimpopoR_IRR_lo
OtherGrain_LimpopoR_RFD_hi
OtherGrain_LimpopoR_RFD_lo
OtherGrain_LoireR_IRR_hi
OtherGrain_LoireR_IRR_lo
OtherGrain_LoireR_RFD_hi

OtherGrain_LoireR_RFD_lo
OtherGrain_Mackenzie_IRR_hi
OtherGrain_Mackenzie_IRR_lo
OtherGrain_Mackenzie_RFD_hi
OtherGrain_Mackenzie_RFD_lo
OtherGrain_MagdalenaR_IRR_hi
OtherGrain_MagdalenaR_IRR_lo
OtherGrain_MagdalenaR_RFD_hi
OtherGrain_MagdalenaR_RFD_lo
OtherGrain_MahanadiR_IRR_hi
OtherGrain_MahanadiR_IRR_lo
OtherGrain_MahanadiR_RFD_hi
OtherGrain_MahanadiR_RFD_lo
OtherGrain_MahiR_IRR_hi
OtherGrain_MahiR_IRR_lo
OtherGrain_MahiR_RFD_hi
OtherGrain_MahiR_RFD_lo
OtherGrain_MalaysiaP_IRR_hi
OtherGrain_MalaysiaP_IRR_lo
OtherGrain_MalaysiaP_RFD_hi
OtherGrain_MalaysiaP_RFD_lo
OtherGrain_MarChiq_IRR_hi
OtherGrain_MarChiq_IRR_lo
OtherGrain_MarChiq_RFD_hi
OtherGrain_MarChiq_RFD_lo
OtherGrain_MeditE_IRR_hi
OtherGrain_MeditE_IRR_lo
OtherGrain_MeditE_RFD_hi
OtherGrain_MeditE_RFD_lo
OtherGrain_MeditIsl_IRR_hi
OtherGrain_MeditIsl_IRR_lo
OtherGrain_MeditIsl_RFD_hi
OtherGrain_MeditIsl_RFD_lo
OtherGrain_MeditS_IRR_hi
OtherGrain_MeditS_IRR_lo
OtherGrain_MeditS_RFD_hi
OtherGrain_MeditS_RFD_lo
OtherGrain_Mekong_IRR_hi
OtherGrain_Mekong_IRR_lo
OtherGrain_Mekong_RFD_hi
OtherGrain_Mekong_RFD_lo
OtherGrain_MexBaja_IRR_hi
OtherGrain_MexBaja_IRR_lo
OtherGrain_MexBaja_RFD_hi
OtherGrain_MexBaja_RFD_lo
OtherGrain_MexCstNW_IRR_hi
OtherGrain_MexCstNW_IRR_lo
OtherGrain_MexCstNW_RFD_hi
OtherGrain_MexCstNW_RFD_lo
OtherGrain_MexCstW_IRR_hi
OtherGrain_MexCstW_IRR_lo
OtherGrain_MexCstW_RFD_hi
OtherGrain_MexCstW_RFD_lo
OtherGrain_MexGulf_IRR_hi
OtherGrain_MexGulf_IRR_lo
OtherGrain_MexGulf_RFD_hi
OtherGrain_MexGulf_RFD_lo
OtherGrain_MexInt_IRR_hi
OtherGrain_MexInt_IRR_lo
OtherGrain_MexInt_RFD_hi
OtherGrain_MexInt_RFD_lo
OtherGrain_MissouriR_IRR_hi
OtherGrain_MissouriR_IRR_lo
OtherGrain_MissouriR_RFD_hi
OtherGrain_MissouriR_RFD_lo
OtherGrain_MissppRN_IRR_hi
OtherGrain_MissppRN_IRR_lo
OtherGrain_MissppRN_RFD_hi
OtherGrain_MissppRN_RFD_lo
OtherGrain_MissppRS_IRR_hi
OtherGrain_MissppRS_IRR_lo
OtherGrain_MissppRS_RFD_hi
OtherGrain_MissppRS_RFD_lo
OtherGrain_MurrayDrlg_IRR_hi
OtherGrain_MurrayDrlg_IRR_lo
OtherGrain_MurrayDrlg_RFD_hi
OtherGrain_MurrayDrlg_RFD_lo
OtherGrain_NarmadaR_IRR_hi
OtherGrain_NarmadaR_IRR_lo
OtherGrain_NarmadaR_RFD_hi
OtherGrain_NarmadaR_RFD_lo
OtherGrain_NarvaR_IRR_hi
OtherGrain_NarvaR_IRR_lo
OtherGrain_NarvaR_RFD_hi
OtherGrain_NarvaR_RFD_lo
OtherGrain_NegroR_IRR_hi
OtherGrain_NegroR_IRR_lo
OtherGrain_NegroR_RFD_hi
OtherGrain_NegroR_RFD_lo
OtherGrain_NelsonR_IRR_hi
OtherGrain_NelsonR_IRR_lo
OtherGrain_NelsonR_RFD_hi
OtherGrain_NelsonR_RFD_lo
OtherGrain_NemanR_IRR_hi
OtherGrain_NemanR_IRR_lo
OtherGrain_NemanR_RFD_hi

OtherGrain_NemanR_RFD_lo
OtherGrain_NevaR_IRR_hi
OtherGrain_NevaR_IRR_lo
OtherGrain_NevaR_RFD_hi
OtherGrain_NevaR_RFD_lo
OtherGrain_NewZealand_IRR_hi
OtherGrain_NewZealand_IRR_lo
OtherGrain_NewZealand_RFD_hi
OtherGrain_NewZealand_RFD_lo
OtherGrain_NigerR_IRR_hi
OtherGrain_NigerR_IRR_lo
OtherGrain_NigerR_RFD_hi
OtherGrain_NigerR_RFD_lo
OtherGrain_NileR_IRR_hi
OtherGrain_NileR_IRR_lo
OtherGrain_NileR_RFD_hi
OtherGrain_NileR_RFD_lo
OtherGrain_NWTerr_IRR_hi
OtherGrain_NWTerr_IRR_lo
OtherGrain_NWTerr_RFD_hi
OtherGrain_NWTerr_RFD_lo
OtherGrain_ObR_IRR_hi
OtherGrain_ObR_IRR_lo
OtherGrain_ObR_RFD_hi
OtherGrain_ObR_RFD_lo
OtherGrain_OderR_IRR_hi
OtherGrain_OderR_IRR_lo
OtherGrain_OderR_RFD_hi
OtherGrain_OderR_RFD_lo
OtherGrain_OhioR_IRR_hi
OtherGrain_OhioR_IRR_lo
OtherGrain_OhioR_RFD_hi
OtherGrain_OhioR_RFD_lo
OtherGrain_OrangeR_IRR_hi
OtherGrain_OrangeR_IRR_lo
OtherGrain_OrangeR_RFD_hi
OtherGrain_OrangeR_RFD_lo
OtherGrain_OrinocoR_IRR_hi
OtherGrain_OrinocoR_IRR_lo
OtherGrain_OrinocoR_RFD_hi
OtherGrain_OrinocoR_RFD_lo
OtherGrain_PacArctic_IRR_hi
OtherGrain_PacArctic_IRR_lo
OtherGrain_PacArctic_RFD_hi
OtherGrain_PacArctic_RFD_lo
OtherGrain_Pampas_IRR_hi
OtherGrain_Pampas_IRR_lo
OtherGrain_Pampas_RFD_hi
OtherGrain_Pampas_RFD_lo
OtherGrain_Papaloapan_IRR_hi
OtherGrain_Papaloapan_IRR_lo
OtherGrain_Papaloapan_RFD_hi
OtherGrain_Papaloapan_RFD_lo
OtherGrain_ParnaibaR_IRR_hi
OtherGrain_ParnaibaR_IRR_lo
OtherGrain_ParnaibaR_RFD_hi
OtherGrain_ParnaibaR_RFD_lo
OtherGrain_Patagonia_IRR_hi
OtherGrain_Patagonia_IRR_lo
OtherGrain_Patagonia_RFD_hi
OtherGrain_Patagonia_RFD_lo
OtherGrain_PersianGulf_IRR_hi
OtherGrain_PersianGulf_IRR_lo
OtherGrain_PersianGulf_RFD_hi
OtherGrain_PersianGulf_RFD_lo
OtherGrain_PeruCst_IRR_hi
OtherGrain_PeruCst_IRR_lo
OtherGrain_PeruCst_RFD_hi
OtherGrain_PeruCst_RFD_lo
OtherGrain_PolandCst_IRR_hi
OtherGrain_PolandCst_IRR_lo
OtherGrain_PolandCst_RFD_hi
OtherGrain_PolandCst_RFD_lo
OtherGrain_PoR_IRR_hi
OtherGrain_PoR_IRR_lo
OtherGrain_PoR_RFD_hi
OtherGrain_PoR_RFD_lo
OtherGrain_RedSeaE_IRR_hi
OtherGrain_RedSeaE_IRR_lo
OtherGrain_RedSeaE_RFD_hi
OtherGrain_RedSeaE_RFD_lo
OtherGrain_RhineR_IRR_hi
OtherGrain_RhineR_IRR_lo
OtherGrain_RhineR_RFD_hi
OtherGrain_RhineR_RFD_lo
OtherGrain_RhoneR_IRR_hi
OtherGrain_RhoneR_IRR_lo
OtherGrain_RhoneR_RFD_hi
OtherGrain_RhoneR_RFD_lo
OtherGrain_RiftValley_IRR_hi
OtherGrain_RiftValley_IRR_lo
OtherGrain_RiftValley_RFD_hi
OtherGrain_RiftValley_RFD_lo
OtherGrain_RioBalsas_IRR_hi
OtherGrain_RioBalsas_IRR_lo
OtherGrain_RioBalsas_RFD_hi

OtherGrain_RioBalsas_RFD_lo
OtherGrain_RioGrande_IRR_hi
OtherGrain_RioGrande_IRR_lo
OtherGrain_RioGrande_RFD_hi
OtherGrain_RioGrande_RFD_lo
OtherGrain_RioLaPlata_IRR_hi
OtherGrain_RioLaPlata_IRR_lo
OtherGrain_RioLaPlata_RFD_hi
OtherGrain_RioLaPlata_RFD_lo
OtherGrain_RioLerma_IRR_hi
OtherGrain_RioLerma_IRR_lo
OtherGrain_RioLerma_RFD_hi
OtherGrain_RioLerma_RFD_lo
OtherGrain_RioVerde_IRR_hi
OtherGrain_RioVerde_IRR_lo
OtherGrain_RioVerde_RFD_hi
OtherGrain_RioVerde_RFD_lo
OtherGrain_RusCstSE_IRR_hi
OtherGrain_RusCstSE_IRR_lo
OtherGrain_RusCstSE_RFD_hi
OtherGrain_RusCstSE_RFD_lo
OtherGrain_SabarmatiR_IRR_hi
OtherGrain_SabarmatiR_IRR_lo
OtherGrain_SabarmatiR_RFD_hi
OtherGrain_SabarmatiR_RFD_lo
OtherGrain_Salinas_IRR_hi
OtherGrain_Salinas_IRR_lo
OtherGrain_Salinas_RFD_hi
OtherGrain_Salinas_RFD_lo
OtherGrain_Salween_IRR_hi
OtherGrain_Salween_IRR_lo
OtherGrain_Salween_RFD_hi
OtherGrain_Salween_RFD_lo
OtherGrain_SAmerCstN_IRR_hi
OtherGrain_SAmerCstN_IRR_lo
OtherGrain_SAmerCstN_RFD_hi
OtherGrain_SAmerCstN_RFD_lo
OtherGrain_SAmerCstNE_RFD_hi
OtherGrain_SAmerCstNE_RFD_lo
OtherGrain_SaoFrancR_IRR_hi
OtherGrain_SaoFrancR_IRR_lo
OtherGrain_SaoFrancR_RFD_hi
OtherGrain_SaoFrancR_RFD_lo
OtherGrain_ScheldtR_IRR_hi
OtherGrain_ScheldtR_IRR_lo
OtherGrain_ScheldtR_RFD_hi
OtherGrain_ScheldtR_RFD_lo
OtherGrain_SChinaSea_IRR_hi
OtherGrain_SChinaSea_IRR_lo
OtherGrain_SChinaSea_RFD_hi
OtherGrain_SChinaSea_RFD_lo
OtherGrain_ScndnvN_IRR_hi
OtherGrain_ScndnvN_IRR_lo
OtherGrain_ScndnvN_RFD_hi
OtherGrain_ScndnvN_RFD_lo
OtherGrain_Scotland_IRR_hi
OtherGrain_Scotland_IRR_lo
OtherGrain_Scotland_RFD_hi
OtherGrain_Scotland_RFD_lo
OtherGrain_SeineR_IRR_hi
OtherGrain_SeineR_IRR_lo
OtherGrain_SeineR_RFD_hi
OtherGrain_SeineR_RFD_lo
OtherGrain_SenegalR_IRR_hi
OtherGrain_SenegalR_IRR_lo
OtherGrain_SenegalR_RFD_hi
OtherGrain_SenegalR_RFD_lo
OtherGrain_ShebJubR_IRR_hi
OtherGrain_ShebJubR_IRR_lo
OtherGrain_ShebJubR_RFD_hi
OtherGrain_ShebJubR_RFD_lo
OtherGrain_SiberiaW_IRR_hi
OtherGrain_SiberiaW_IRR_lo
OtherGrain_SiberiaW_RFD_hi
OtherGrain_SiberiaW_RFD_lo
OtherGrain_SinaiP_IRR_hi
OtherGrain_SinaiP_IRR_lo
OtherGrain_SinaiP_RFD_hi
OtherGrain_SinaiP_RFD_lo
OtherGrain_SittaungR_IRR_hi
OtherGrain_SittaungR_IRR_lo
OtherGrain_SittaungR_RFD_hi
OtherGrain_SittaungR_RFD_lo
OtherGrain_SpainCstSE_IRR_hi
OtherGrain_SpainCstSE_IRR_lo
OtherGrain_SpainCstSE_RFD_hi
OtherGrain_SpainCstSE_RFD_lo
OtherGrain_StLwrncR_IRR_hi
OtherGrain_StLwrncR_IRR_lo
OtherGrain_StLwrncR_RFD_hi
OtherGrain_StLwrncR_RFD_lo
OtherGrain_Sweden_IRR_hi
OtherGrain_Sweden_IRR_lo
OtherGrain_Sweden_RFD_hi
OtherGrain_Sweden_RFD_lo
OtherGrain_SyrDaryaR_IRR_hi

OtherGrain_SyrDaryaR_IRR_lo
OtherGrain_SyrDaryaR_RFD_hi
OtherGrain_SyrDaryaR_RFD_lo
OtherGrain_TagusR_IRR_hi
OtherGrain_TagusR_IRR_lo
OtherGrain_TagusR_RFD_hi
OtherGrain_TagusR_RFD_lo
OtherGrain_Taiwan_IRR_hi
OtherGrain_Taiwan_IRR_lo
OtherGrain_Taiwan_RFD_hi
OtherGrain_Taiwan_RFD_lo
OtherGrain_TaptiR_IRR_hi
OtherGrain_TaptiR_IRR_lo
OtherGrain_TaptiR_RFD_hi
OtherGrain_TaptiR_RFD_lo
OtherGrain_Tarim_IRR_hi
OtherGrain_Tarim_IRR_lo
OtherGrain_Tarim_RFD_hi
OtherGrain_Tarim_RFD_lo
OtherGrain_Tasmania_IRR_hi
OtherGrain_Tasmania_IRR_lo
OtherGrain_Tasmania_RFD_hi
OtherGrain_Tasmania_RFD_lo
OtherGrain_Tehuantpc_IRR_hi
OtherGrain_Tehuantpc_IRR_lo
OtherGrain_Tehuantpc_RFD_hi
OtherGrain_Tehuantpc_RFD_lo
OtherGrain_TennR_IRR_hi
OtherGrain_TennR_IRR_lo
OtherGrain_TennR_RFD_hi
OtherGrain_TennR_RFD_lo
OtherGrain_TexasCst_IRR_hi
OtherGrain_TexasCst_IRR_lo
OtherGrain_TexasCst_RFD_hi
OtherGrain_TexasCst_RFD_lo
OtherGrain_ThaiGulf_IRR_hi
OtherGrain_ThaiGulf_IRR_lo
OtherGrain_ThaiGulf_RFD_hi
OtherGrain_ThaiGulf_RFD_lo
OtherGrain_TiberR_IRR_hi
OtherGrain_TiberR_IRR_lo
OtherGrain_TiberR_RFD_hi
OtherGrain_TiberR_RFD_lo
OtherGrain_TigrEuphR_IRR_hi
OtherGrain_TigrEuphR_IRR_lo
OtherGrain_TigrEuphR_RFD_hi
OtherGrain_TigrEuphR_RFD_lo
OtherGrain_TocantinsR_IRR_hi
OtherGrain_TocantinsR_IRR_lo
OtherGrain_TocantinsR_RFD_hi
OtherGrain_TocantinsR_RFD_lo
OtherGrain_UralR_IRR_hi
OtherGrain_UralR_IRR_lo
OtherGrain_UralR_RFD_hi
OtherGrain_UralR_RFD_lo
OtherGrain_UsaColoRN_IRR_hi
OtherGrain_UsaColoRN_IRR_lo
OtherGrain_UsaColoRN_RFD_hi
OtherGrain_UsaColoRN_RFD_lo
OtherGrain_UsaColoRS_IRR_hi
OtherGrain_UsaColoRS_IRR_lo
OtherGrain_UsaColoRS_RFD_hi
OtherGrain_UsaColoRS_RFD_lo
OtherGrain_UsaCstE_IRR_hi
OtherGrain_UsaCstE_IRR_lo
OtherGrain_UsaCstE_RFD_hi
OtherGrain_UsaCstE_RFD_lo
OtherGrain_UsaCstNE_IRR_hi
OtherGrain_UsaCstNE_IRR_lo
OtherGrain_UsaCstNE_RFD_hi
OtherGrain_UsaCstNE_RFD_lo
OtherGrain_UsaCstSE_IRR_hi
OtherGrain_UsaCstSE_IRR_lo
OtherGrain_UsaCstSE_RFD_hi
OtherGrain_UsaCstSE_RFD_lo
OtherGrain_UsaPacNW_IRR_hi
OtherGrain_UsaPacNW_IRR_lo
OtherGrain_UsaPacNW_RFD_hi
OtherGrain_UsaPacNW_RFD_lo
OtherGrain_VolgaR_IRR_hi
OtherGrain_VolgaR_IRR_lo
OtherGrain_VolgaR_RFD_hi
OtherGrain_VolgaR_RFD_lo
OtherGrain_VoltaR_IRR_hi
OtherGrain_VoltaR_IRR_lo
OtherGrain_VoltaR_RFD_hi
OtherGrain_VoltaR_RFD_lo
OtherGrain_WislaR_IRR_hi
OtherGrain_WislaR_IRR_lo
OtherGrain_WislaR_RFD_hi
OtherGrain_WislaR_RFD_lo
OtherGrain_XunJiang_IRR_hi
OtherGrain_XunJiang_IRR_lo
OtherGrain_XunJiang_RFD_hi
OtherGrain_XunJiang_RFD_lo
OtherGrain_Yangtze_IRR_hi

OtherGrain_Yangtze_IRR_lo
OtherGrain_Yangtze_RFD_hi
OtherGrain_Yangtze_RFD_lo
OtherGrain_YeniseiR_IRR_hi
OtherGrain_YeniseiR_IRR_lo
OtherGrain_YeniseiR_RFD_hi
OtherGrain_YeniseiR_RFD_lo
OtherGrain_YucatanP_RFD_hi
OtherGrain_YucatanP_RFD_lo
OtherGrain_ZambeziR_IRR_hi
OtherGrain_ZambeziR_IRR_lo
OtherGrain_ZambeziR_RFD_hi
OtherGrain_ZambeziR_RFD_lo
OtherGrain_ZiyaHe_IRR_hi
OtherGrain_ZiyaHe_IRR_lo
OtherGrain_ZiyaHe_RFD_hi
OtherGrain_ZiyaHe_RFD_lo
OtherGrainC4_AdrBlkSea_RFD_hi
OtherGrainC4_AdrBlkSea_RFD_lo
OtherGrainC4_AfrCstE_RFD_hi
OtherGrainC4_AfrCstE_RFD_lo
OtherGrainC4_AfrCstNE_IRR_hi
OtherGrainC4_AfrCstNE_IRR_lo
OtherGrainC4_AfrCstNE_RFD_hi
OtherGrainC4_AfrCstNE_RFD_lo
OtherGrainC4_AfrCstNW_IRR_hi
OtherGrainC4_AfrCstNW_IRR_lo
OtherGrainC4_AfrCstNW_RFD_hi
OtherGrainC4_AfrCstNW_RFD_lo
OtherGrainC4_AfrCstS_IRR_hi
OtherGrainC4_AfrCstS_IRR_lo
OtherGrainC4_AfrCstS_RFD_hi
OtherGrainC4_AfrCstS_RFD_lo
OtherGrainC4_AfrCstSE_IRR_hi
OtherGrainC4_AfrCstSE_IRR_lo
OtherGrainC4_AfrCstSE_RFD_hi
OtherGrainC4_AfrCstSE_RFD_lo
OtherGrainC4_AfrCstSSW_IRR_hi
OtherGrainC4_AfrCstSSW_IRR_lo
OtherGrainC4_AfrCstSSW_RFD_hi
OtherGrainC4_AfrCstSSW_RFD_lo
OtherGrainC4_AfrCstSW_RFD_hi
OtherGrainC4_AfrCstSW_RFD_lo
OtherGrainC4_AfrCstW_RFD_hi
OtherGrainC4_AfrCstW_RFD_lo
OtherGrainC4_AfrIntN_IRR_hi
OtherGrainC4_AfrIntN_IRR_lo
OtherGrainC4_AfrIntN_RFD_hi
OtherGrainC4_AfrIntN_RFD_lo
OtherGrainC4_AfrIntS_RFD_hi
OtherGrainC4_AfrIntS_RFD_lo
OtherGrainC4_AmazonR_RFD_hi
OtherGrainC4_AmazonR_RFD_lo
OtherGrainC4_AmuDaryaR_IRR_hi
OtherGrainC4_AmuDaryaR_IRR_lo
OtherGrainC4_AmuDaryaR_RFD_hi
OtherGrainC4_AmuDaryaR_RFD_lo
OtherGrainC4_AmurR_IRR_hi
OtherGrainC4_AmurR_IRR_lo
OtherGrainC4_AmurR_RFD_hi
OtherGrainC4_AmurR_RFD_lo
OtherGrainC4_AngolaCst_RFD_hi
OtherGrainC4_AngolaCst_RFD_lo
OtherGrainC4_ArabianP_IRR_hi
OtherGrainC4_ArabianP_IRR_lo
OtherGrainC4_ArabianP_RFD_hi
OtherGrainC4_ArabianP_RFD_lo
OtherGrainC4_ArabianSea_IRR_hi
OtherGrainC4_ArabianSea_IRR_lo
OtherGrainC4_ArabianSea_RFD_hi
OtherGrainC4_ArabianSea_RFD_lo
OtherGrainC4_ArgColoR_IRR_hi
OtherGrainC4_ArgColoR_IRR_lo
OtherGrainC4_ArgColoR_RFD_hi
OtherGrainC4_ArgColoR_RFD_lo
OtherGrainC4_ArgCstN_IRR_hi
OtherGrainC4_ArgCstN_IRR_lo
OtherGrainC4_ArgCstN_RFD_hi
OtherGrainC4_ArgCstN_RFD_lo
OtherGrainC4_ArgCstS_IRR_hi
OtherGrainC4_ArgCstS_IRR_lo
OtherGrainC4_ArgCstS_RFD_hi
OtherGrainC4_ArgCstS_RFD_lo
OtherGrainC4_ArkWhtRedR_IRR_hi
OtherGrainC4_ArkWhtRedR_IRR_lo
OtherGrainC4_ArkWhtRedR_RFD_hi
OtherGrainC4_ArkWhtRedR_RFD_lo
OtherGrainC4_AusCstE_IRR_hi
OtherGrainC4_AusCstE_IRR_lo
OtherGrainC4_AusCstE_RFD_hi
OtherGrainC4_AusCstE_RFD_lo
OtherGrainC4_AusCstN_RFD_hi
OtherGrainC4_AusCstN_RFD_lo
OtherGrainC4_AusCstS_RFD_hi
OtherGrainC4_AusCstS_RFD_lo
OtherGrainC4_AusCstW_RFD_hi

OtherGrainC4_AusCstW_RFD_lo
OtherGrainC4_AusInt_RFD_hi
OtherGrainC4_AusInt_RFD_lo
OtherGrainC4_BalticSea_RFD_hi
OtherGrainC4_BalticSea_RFD_lo
OtherGrainC4_BarentsSea_RFD_hi
OtherGrainC4_BarentsSea_RFD_lo
OtherGrainC4_BengalBay_RFD_hi
OtherGrainC4_BengalBay_RFD_lo
OtherGrainC4_BengalW_IRR_hi
OtherGrainC4_BengalW_IRR_lo
OtherGrainC4_BengalW_RFD_hi
OtherGrainC4_BengalW_RFD_lo
OtherGrainC4_BlackSeaN_IRR_hi
OtherGrainC4_BlackSeaN_IRR_lo
OtherGrainC4_BlackSeaN_RFD_hi
OtherGrainC4_BlackSeaN_RFD_lo
OtherGrainC4_BlackSeaS_RFD_hi
OtherGrainC4_BlackSeaS_RFD_lo
OtherGrainC4_BoHai_IRR_hi
OtherGrainC4_BoHai_IRR_lo
OtherGrainC4_BoHai_RFD_hi
OtherGrainC4_BoHai_RFD_lo
OtherGrainC4_BrahmaniR_IRR_hi
OtherGrainC4_BrahmaniR_IRR_lo
OtherGrainC4_BrahmaniR_RFD_hi
OtherGrainC4_BrahmaniR_RFD_lo
OtherGrainC4_BrzCstE_RFD_hi
OtherGrainC4_BrzCstE_RFD_lo
OtherGrainC4_BrzCstS_RFD_hi
OtherGrainC4_BrzCstS_RFD_lo
OtherGrainC4_California_IRR_hi
OtherGrainC4_California_IRR_lo
OtherGrainC4_California_RFD_hi
OtherGrainC4_California_RFD_lo
OtherGrainC4_Caribbean_RFD_hi
OtherGrainC4_Caribbean_RFD_lo
OtherGrainC4_CaspianE_IRR_hi
OtherGrainC4_CaspianE_IRR_lo
OtherGrainC4_CaspianE_RFD_hi
OtherGrainC4_CaspianE_RFD_lo
OtherGrainC4_CaspianNE_IRR_hi
OtherGrainC4_CaspianNE_IRR_lo
OtherGrainC4_CaspianNE_RFD_hi
OtherGrainC4_CaspianNE_RFD_lo
OtherGrainC4_CaspianSW_RFD_hi
OtherGrainC4_CaspianSW_RFD_lo
OtherGrainC4_CauveryR_IRR_hi
OtherGrainC4_CauveryR_IRR_lo
OtherGrainC4_CauveryR_RFD_hi
OtherGrainC4_CauveryR_RFD_lo
OtherGrainC4_ChaoPhrR_RFD_hi
OtherGrainC4_ChaoPhrR_RFD_lo
OtherGrainC4_ChileCstS_RFD_hi
OtherGrainC4_ChileCstS_RFD_lo
OtherGrainC4_ChinaCst_IRR_hi
OtherGrainC4_ChinaCst_IRR_lo
OtherGrainC4_ChinaCst_RFD_hi
OtherGrainC4_ChinaCst_RFD_lo
OtherGrainC4_CntAmer_IRR_hi
OtherGrainC4_CntAmer_IRR_lo
OtherGrainC4_CntAmer_RFD_hi
OtherGrainC4_CntAmer_RFD_lo
OtherGrainC4_ColEcuaCst_RFD_hi
OtherGrainC4_ColEcuaCst_RFD_lo
OtherGrainC4_CongoR_RFD_hi
OtherGrainC4_CongoR_RFD_lo
OtherGrainC4_DanubeR_RFD_hi
OtherGrainC4_DanubeR_RFD_lo
OtherGrainC4_DaugavaR_RFD_hi
OtherGrainC4_DaugavaR_RFD_lo
OtherGrainC4_DeadSea_RFD_hi
OtherGrainC4_DeadSea_RFD_lo
OtherGrainC4_DnieperR_IRR_hi
OtherGrainC4_DnieperR_IRR_lo
OtherGrainC4_DnieperR_RFD_hi
OtherGrainC4_DnieperR_RFD_lo
OtherGrainC4_DniesterR_RFD_hi
OtherGrainC4_DniesterR_RFD_lo
OtherGrainC4_DnkGrmCst_RFD_hi
OtherGrainC4_DnkGrmCst_RFD_lo
OtherGrainC4_DonR_IRR_hi
OtherGrainC4_DonR_IRR_lo
OtherGrainC4_DonR_RFD_hi
OtherGrainC4_DonR_RFD_lo
OtherGrainC4_DouroR_RFD_hi
OtherGrainC4_DouroR_RFD_lo
OtherGrainC4_DvinaRN_RFD_hi
OtherGrainC4_DvinaRN_RFD_lo
OtherGrainC4_EbroR_IRR_hi
OtherGrainC4_EbroR_IRR_lo
OtherGrainC4_EbroR_RFD_hi
OtherGrainC4_EbroR_RFD_lo
OtherGrainC4_EJrdnSyr_IRR_hi
OtherGrainC4_EJrdnSyr_IRR_lo
OtherGrainC4_EJrdnSyr_RFD_hi

OtherGrainC4_EJrdnSyr_RFD_lo
OtherGrainC4_ElbeR_RFD_hi
OtherGrainC4_ElbeR_RFD_lo
OtherGrainC4_FarahrudR_RFD_hi
OtherGrainC4_FarahrudR_RFD_lo
OtherGrainC4_Finland_RFD_hi
OtherGrainC4_Finland_RFD_lo
OtherGrainC4_FlyR_RFD_hi
OtherGrainC4_FlyR_RFD_lo
OtherGrainC4_FranceCstS_IRR_hi
OtherGrainC4_FranceCstS_IRR_lo
OtherGrainC4_FranceCstS_RFD_hi
OtherGrainC4_FranceCstS_RFD_lo
OtherGrainC4_FranceCstW_IRR_hi
OtherGrainC4_FranceCstW_IRR_lo
OtherGrainC4_FranceCstW_RFD_hi
OtherGrainC4_FranceCstW_RFD_lo
OtherGrainC4_GangesR_IRR_hi
OtherGrainC4_GangesR_IRR_lo
OtherGrainC4_GangesR_RFD_hi
OtherGrainC4_GangesR_RFD_lo
OtherGrainC4_Gironde_IRR_hi
OtherGrainC4_Gironde_IRR_lo
OtherGrainC4_Gironde_RFD_hi
OtherGrainC4_Gironde_RFD_lo
OtherGrainC4_Gobi_IRR_hi
OtherGrainC4_Gobi_IRR_lo
OtherGrainC4_Gobi_RFD_hi
OtherGrainC4_Gobi_RFD_lo
OtherGrainC4_GodavariR_IRR_hi
OtherGrainC4_GodavariR_IRR_lo
OtherGrainC4_GodavariR_RFD_hi
OtherGrainC4_GodavariR_RFD_lo
OtherGrainC4_GreatBasin_IRR_hi
OtherGrainC4_GreatBasin_IRR_lo
OtherGrainC4_GreatBasin_RFD_hi
OtherGrainC4_GreatBasin_RFD_lo
OtherGrainC4_GreatLakes_IRR_hi
OtherGrainC4_GreatLakes_IRR_lo
OtherGrainC4_GreatLakes_RFD_hi
OtherGrainC4_GreatLakes_RFD_lo
OtherGrainC4_GrijUsuR_IRR_hi
OtherGrainC4_GrijUsuR_IRR_lo
OtherGrainC4_GrijUsuR_RFD_hi
OtherGrainC4_GrijUsuR_RFD_lo
OtherGrainC4_GuadalqR_RFD_hi
OtherGrainC4_GuadalqR_RFD_lo
OtherGrainC4_GuadianaR_RFD_hi
OtherGrainC4_GuadianaR_RFD_lo
OtherGrainC4_GuineaGulf_RFD_hi
OtherGrainC4_GuineaGulf_RFD_lo
OtherGrainC4_Hainan_IRR_hi
OtherGrainC4_Hainan_IRR_lo
OtherGrainC4_HamuMashR_IRR_hi
OtherGrainC4_HamuMashR_IRR_lo
OtherGrainC4_HamuMashR_RFD_hi
OtherGrainC4_HamuMashR_RFD_lo
OtherGrainC4_Helmand_IRR_hi
OtherGrainC4_Helmand_IRR_lo
OtherGrainC4_Helmand_RFD_hi
OtherGrainC4_Helmand_RFD_lo
OtherGrainC4_Hong_IRR_hi
OtherGrainC4_Hong_IRR_lo
OtherGrainC4_Hong_RFD_hi
OtherGrainC4_Hong_RFD_lo
OtherGrainC4_HuangHeR_IRR_hi
OtherGrainC4_HuangHeR_IRR_lo
OtherGrainC4_HuangHeR_RFD_hi
OtherGrainC4_HuangHeR_RFD_lo
OtherGrainC4_IberiaCst_RFD_hi
OtherGrainC4_IberiaCst_RFD_lo
OtherGrainC4_IndCstE_IRR_hi
OtherGrainC4_IndCstE_IRR_lo
OtherGrainC4_IndCstE_RFD_hi
OtherGrainC4_IndCstE_RFD_lo
OtherGrainC4_IndCstNE_IRR_hi
OtherGrainC4_IndCstNE_IRR_lo
OtherGrainC4_IndCstNE_RFD_hi
OtherGrainC4_IndCstNE_RFD_lo
OtherGrainC4_IndCstS_IRR_hi
OtherGrainC4_IndCstS_IRR_lo
OtherGrainC4_IndCstS_RFD_hi
OtherGrainC4_IndCstS_RFD_lo
OtherGrainC4_IndCstW_IRR_hi
OtherGrainC4_IndCstW_IRR_lo
OtherGrainC4_IndCstW_RFD_hi
OtherGrainC4_IndCstW_RFD_lo
OtherGrainC4_IndusR_IRR_hi
OtherGrainC4_IndusR_IRR_lo
OtherGrainC4_IndusR_RFD_hi
OtherGrainC4_IndusR_RFD_lo
OtherGrainC4_Iran_RFD_hi
OtherGrainC4_Iran_RFD_lo
OtherGrainC4_IrianJaya_RFD_hi
OtherGrainC4_IrianJaya_RFD_lo
OtherGrainC4_IrrawaddyR_IRR_hi

OtherGrainC4_IrrawaddyR_IRR_lo
OtherGrainC4_IrrawaddyR_RFD_hi
OtherGrainC4_IrrawaddyR_RFD_lo
OtherGrainC4_ItalyCstE_RFD_hi
OtherGrainC4_ItalyCstE_RFD_lo
OtherGrainC4_ItalyCstW_RFD_hi
OtherGrainC4_ItalyCstW_RFD_lo
OtherGrainC4_Japan_RFD_hi
OtherGrainC4_Japan_RFD_lo
OtherGrainC4_Korea_RFD_hi
OtherGrainC4_Korea_RFD_lo
OtherGrainC4_KrishnaR_IRR_hi
OtherGrainC4_KrishnaR_IRR_lo
OtherGrainC4_KrishnaR_RFD_hi
OtherGrainC4_KrishnaR_RFD_lo
OtherGrainC4_LaPuna_RFD_hi
OtherGrainC4_LaPuna_RFD_lo
OtherGrainC4_LBalkash_IRR_hi
OtherGrainC4_LBalkash_IRR_lo
OtherGrainC4_LBalkash_RFD_hi
OtherGrainC4_LBalkash_RFD_lo
OtherGrainC4_LChad_IRR_hi
OtherGrainC4_LChad_IRR_lo
OtherGrainC4_LChad_RFD_hi
OtherGrainC4_LChad_RFD_lo
OtherGrainC4_LenaR_RFD_hi
OtherGrainC4_LenaR_RFD_lo
OtherGrainC4_LimpopoR_IRR_hi
OtherGrainC4_LimpopoR_IRR_lo
OtherGrainC4_LimpopoR_RFD_hi
OtherGrainC4_LimpopoR_RFD_lo
OtherGrainC4_LoireR_IRR_hi
OtherGrainC4_LoireR_IRR_lo
OtherGrainC4_LoireR_RFD_hi
OtherGrainC4_LoireR_RFD_lo
OtherGrainC4_Madagascar_RFD_hi
OtherGrainC4_Madagascar_RFD_lo
OtherGrainC4_MagdalenaR_RFD_hi
OtherGrainC4_MagdalenaR_RFD_lo
OtherGrainC4_MahanadiR_IRR_hi
OtherGrainC4_MahanadiR_IRR_lo
OtherGrainC4_MahanadiR_RFD_hi
OtherGrainC4_MahanadiR_RFD_lo
OtherGrainC4_MahiR_IRR_hi
OtherGrainC4_MahiR_IRR_lo
OtherGrainC4_MahiR_RFD_hi
OtherGrainC4_MahiR_RFD_lo
OtherGrainC4_MalaysiaP_RFD_hi
OtherGrainC4_MalaysiaP_RFD_lo
OtherGrainC4_MarChiq_IRR_hi
OtherGrainC4_MarChiq_IRR_lo
OtherGrainC4_MarChiq_RFD_hi
OtherGrainC4_MarChiq_RFD_lo
OtherGrainC4_MeditE_RFD_hi
OtherGrainC4_MeditE_RFD_lo
OtherGrainC4_MeditIsl_IRR_hi
OtherGrainC4_MeditIsl_IRR_lo
OtherGrainC4_MeditIsl_RFD_hi
OtherGrainC4_MeditIsl_RFD_lo
OtherGrainC4_MeditS_IRR_hi
OtherGrainC4_MeditS_IRR_lo
OtherGrainC4_MeditS_RFD_hi
OtherGrainC4_MeditS_RFD_lo
OtherGrainC4_Mekong_IRR_hi
OtherGrainC4_Mekong_IRR_lo
OtherGrainC4_Mekong_RFD_hi
OtherGrainC4_Mekong_RFD_lo
OtherGrainC4_MexBaja_IRR_hi
OtherGrainC4_MexBaja_IRR_lo
OtherGrainC4_MexBaja_RFD_hi
OtherGrainC4_MexBaja_RFD_lo
OtherGrainC4_MexCstNW_IRR_hi
OtherGrainC4_MexCstNW_IRR_lo
OtherGrainC4_MexCstNW_RFD_hi
OtherGrainC4_MexCstNW_RFD_lo
OtherGrainC4_MexCstW_IRR_hi
OtherGrainC4_MexCstW_IRR_lo
OtherGrainC4_MexCstW_RFD_hi
OtherGrainC4_MexCstW_RFD_lo
OtherGrainC4_MexGulf_IRR_hi
OtherGrainC4_MexGulf_IRR_lo
OtherGrainC4_MexGulf_RFD_hi
OtherGrainC4_MexGulf_RFD_lo
OtherGrainC4_MexInt_IRR_hi
OtherGrainC4_MexInt_IRR_lo
OtherGrainC4_MexInt_RFD_hi
OtherGrainC4_MexInt_RFD_lo
OtherGrainC4_MissouriR_IRR_hi
OtherGrainC4_MissouriR_IRR_lo
OtherGrainC4_MissouriR_RFD_hi
OtherGrainC4_MissouriR_RFD_lo
OtherGrainC4_MissppRN_IRR_hi
OtherGrainC4_MissppRN_IRR_lo
OtherGrainC4_MissppRN_RFD_hi
OtherGrainC4_MissppRN_RFD_lo
OtherGrainC4_MissppRS_IRR_hi

OtherGrainC4_MisspRS_IRR_lo
OtherGrainC4_MisspRS_RFD_hi
OtherGrainC4_MisspRS_RFD_lo
OtherGrainC4_MurrayDrlg_IRR_hi
OtherGrainC4_MurrayDrlg_IRR_lo
OtherGrainC4_MurrayDrlg_RFD_hi
OtherGrainC4_MurrayDrlg_RFD_lo
OtherGrainC4_NarmadaR_IRR_hi
OtherGrainC4_NarmadaR_IRR_lo
OtherGrainC4_NarmadaR_RFD_hi
OtherGrainC4_NarmadaR_RFD_lo
OtherGrainC4_NarvaR_RFD_hi
OtherGrainC4_NarvaR_RFD_lo
OtherGrainC4_NegroR_IRR_hi
OtherGrainC4_NegroR_IRR_lo
OtherGrainC4_NegroR_RFD_hi
OtherGrainC4_NegroR_RFD_lo
OtherGrainC4_NelsonR_RFD_hi
OtherGrainC4_NelsonR_RFD_lo
OtherGrainC4_NemanR_RFD_hi
OtherGrainC4_NemanR_RFD_lo
OtherGrainC4_NevaR_RFD_hi
OtherGrainC4_NevaR_RFD_lo
OtherGrainC4_NewCaledn_RFD_hi
OtherGrainC4_NewCaledn_RFD_lo
OtherGrainC4_NigerR_IRR_hi
OtherGrainC4_NigerR_IRR_lo
OtherGrainC4_NigerR_RFD_hi
OtherGrainC4_NigerR_RFD_lo
OtherGrainC4_NileR_IRR_hi
OtherGrainC4_NileR_IRR_lo
OtherGrainC4_NileR_RFD_hi
OtherGrainC4_NileR_RFD_lo
OtherGrainC4_ObR_IRR_hi
OtherGrainC4_ObR_IRR_lo
OtherGrainC4_ObR_RFD_hi
OtherGrainC4_ObR_RFD_lo
OtherGrainC4_OderR_RFD_hi
OtherGrainC4_OderR_RFD_lo
OtherGrainC4_OhioR_IRR_hi
OtherGrainC4_OhioR_IRR_lo
OtherGrainC4_OhioR_RFD_hi
OtherGrainC4_OhioR_RFD_lo
OtherGrainC4_OrangeR_IRR_hi
OtherGrainC4_OrangeR_IRR_lo
OtherGrainC4_OrangeR_RFD_hi
OtherGrainC4_OrangeR_RFD_lo
OtherGrainC4_OrinocoR_IRR_hi
OtherGrainC4_OrinocoR_IRR_lo
OtherGrainC4_OrinocoR_RFD_hi
OtherGrainC4_OrinocoR_RFD_lo
OtherGrainC4_Pampas_IRR_hi
OtherGrainC4_Pampas_IRR_lo
OtherGrainC4_Pampas_RFD_hi
OtherGrainC4_Pampas_RFD_lo
OtherGrainC4_Papaloapan_IRR_hi
OtherGrainC4_Papaloapan_IRR_lo
OtherGrainC4_Papaloapan_RFD_hi
OtherGrainC4_Papaloapan_RFD_lo
OtherGrainC4_PapuaCst_RFD_hi
OtherGrainC4_PapuaCst_RFD_lo
OtherGrainC4_ParnaibaR_RFD_hi
OtherGrainC4_ParnaibaR_RFD_lo
OtherGrainC4_Patagonia_RFD_hi
OtherGrainC4_Patagonia_RFD_lo
OtherGrainC4_PennarR_IRR_hi
OtherGrainC4_PennarR_IRR_lo
OtherGrainC4_PennarR_RFD_hi
OtherGrainC4_PennarR_RFD_lo
OtherGrainC4_PersianGulf_RFD_hi
OtherGrainC4_PersianGulf_RFD_lo
OtherGrainC4_PeruCst_RFD_hi
OtherGrainC4_PeruCst_RFD_lo
OtherGrainC4_Phlppns_RFD_hi
OtherGrainC4_Phlppns_RFD_lo
OtherGrainC4_PolandCst_RFD_hi
OtherGrainC4_PolandCst_RFD_lo
OtherGrainC4_PoR_RFD_hi
OtherGrainC4_PoR_RFD_lo
OtherGrainC4_RedSeaE_IRR_hi
OtherGrainC4_RedSeaE_IRR_lo
OtherGrainC4_RedSeaE_RFD_hi
OtherGrainC4_RedSeaE_RFD_lo
OtherGrainC4_RhineR_IRR_hi
OtherGrainC4_RhineR_IRR_lo
OtherGrainC4_RhineR_RFD_hi
OtherGrainC4_RhineR_RFD_lo
OtherGrainC4_RhoneR_IRR_hi
OtherGrainC4_RhoneR_IRR_lo
OtherGrainC4_RhoneR_RFD_hi
OtherGrainC4_RhoneR_RFD_lo
OtherGrainC4_RiftValley_IRR_hi
OtherGrainC4_RiftValley_IRR_lo
OtherGrainC4_RiftValley_RFD_hi
OtherGrainC4_RiftValley_RFD_lo
OtherGrainC4_RioBalsas_IRR_hi

OtherGrainC4_RioBalsas_IRR_lo
OtherGrainC4_RioBalsas_RFD_hi
OtherGrainC4_RioBalsas_RFD_lo
OtherGrainC4_RioGrande_IRR_hi
OtherGrainC4_RioGrande_IRR_lo
OtherGrainC4_RioGrande_RFD_hi
OtherGrainC4_RioGrande_RFD_lo
OtherGrainC4_RioLaPlata_IRR_hi
OtherGrainC4_RioLaPlata_IRR_lo
OtherGrainC4_RioLaPlata_RFD_hi
OtherGrainC4_RioLaPlata_RFD_lo
OtherGrainC4_RioLerma_IRR_hi
OtherGrainC4_RioLerma_IRR_lo
OtherGrainC4_RioLerma_RFD_hi
OtherGrainC4_RioLerma_RFD_lo
OtherGrainC4_RioVerde_IRR_hi
OtherGrainC4_RioVerde_IRR_lo
OtherGrainC4_RioVerde_RFD_hi
OtherGrainC4_RioVerde_RFD_lo
OtherGrainC4_RusCstSE_IRR_hi
OtherGrainC4_RusCstSE_IRR_lo
OtherGrainC4_RusCstSE_RFD_hi
OtherGrainC4_RusCstSE_RFD_lo
OtherGrainC4_SabarmatiR_IRR_hi
OtherGrainC4_SabarmatiR_IRR_lo
OtherGrainC4_SabarmatiR_RFD_hi
OtherGrainC4_SabarmatiR_RFD_lo
OtherGrainC4_Salinas_IRR_hi
OtherGrainC4_Salinas_IRR_lo
OtherGrainC4_Salinas_RFD_hi
OtherGrainC4_Salinas_RFD_lo
OtherGrainC4_Salween_IRR_hi
OtherGrainC4_Salween_IRR_lo
OtherGrainC4_Salween_RFD_hi
OtherGrainC4_Salween_RFD_lo
OtherGrainC4_SAmerCstN_IRR_hi
OtherGrainC4_SAmerCstN_IRR_lo
OtherGrainC4_SAmerCstN_RFD_hi
OtherGrainC4_SAmerCstN_RFD_lo
OtherGrainC4_SAmerCstNE_RFD_hi
OtherGrainC4_SAmerCstNE_RFD_lo
OtherGrainC4_SaoFrancR_IRR_hi
OtherGrainC4_SaoFrancR_IRR_lo
OtherGrainC4_SaoFrancR_RFD_hi
OtherGrainC4_SaoFrancR_RFD_lo
OtherGrainC4_ScheldtR_IRR_hi
OtherGrainC4_ScheldtR_IRR_lo
OtherGrainC4_ScheldtR_RFD_hi
OtherGrainC4_ScheldtR_RFD_lo
OtherGrainC4_SChinaSea_IRR_hi
OtherGrainC4_SChinaSea_IRR_lo
OtherGrainC4_SChinaSea_RFD_hi
OtherGrainC4_SChinaSea_RFD_lo
OtherGrainC4_SeineR_IRR_hi
OtherGrainC4_SeineR_IRR_lo
OtherGrainC4_SeineR_RFD_hi
OtherGrainC4_SeineR_RFD_lo
OtherGrainC4_SenegalR_IRR_hi
OtherGrainC4_SenegalR_IRR_lo
OtherGrainC4_SenegalR_RFD_hi
OtherGrainC4_SenegalR_RFD_lo
OtherGrainC4_SepikR_RFD_hi
OtherGrainC4_SepikR_RFD_lo
OtherGrainC4_ShebJubR_IRR_hi
OtherGrainC4_ShebJubR_IRR_lo
OtherGrainC4_ShebJubR_RFD_hi
OtherGrainC4_ShebJubR_RFD_lo
OtherGrainC4_SiberiaW_RFD_hi
OtherGrainC4_SiberiaW_RFD_lo
OtherGrainC4_SinaiP_RFD_hi
OtherGrainC4_SinaiP_RFD_lo
OtherGrainC4_SittaungR_RFD_hi
OtherGrainC4_SittaungR_RFD_lo
OtherGrainC4_SpainCstSE_RFD_hi
OtherGrainC4_SpainCstSE_RFD_lo
OtherGrainC4_SriLanka_RFD_hi
OtherGrainC4_SriLanka_RFD_lo
OtherGrainC4_SyrDaryaR_IRR_hi
OtherGrainC4_SyrDaryaR_IRR_lo
OtherGrainC4_SyrDaryaR_RFD_hi
OtherGrainC4_SyrDaryaR_RFD_lo
OtherGrainC4_TagusR_RFD_hi
OtherGrainC4_TagusR_RFD_lo
OtherGrainC4_Taiwan_RFD_hi
OtherGrainC4_Taiwan_RFD_lo
OtherGrainC4_TaptiR_IRR_hi
OtherGrainC4_TaptiR_IRR_lo
OtherGrainC4_TaptiR_RFD_hi
OtherGrainC4_TaptiR_RFD_lo
OtherGrainC4_Tarim_IRR_hi
OtherGrainC4_Tarim_IRR_lo
OtherGrainC4_Tarim_RFD_hi
OtherGrainC4_Tarim_RFD_lo
OtherGrainC4_Tasmania_RFD_hi
OtherGrainC4_Tasmania_RFD_lo
OtherGrainC4_Tehuantpc_IRR_hi

OtherGrainC4_Tehuantpc_IRR_lo
OtherGrainC4_Tehuantpc_RFD_hi
OtherGrainC4_Tehuantpc_RFD_lo
OtherGrainC4_TennR_IRR_hi
OtherGrainC4_TennR_IRR_lo
OtherGrainC4_TennR_RFD_hi
OtherGrainC4_TennR_RFD_lo
OtherGrainC4_TexasCst_IRR_hi
OtherGrainC4_TexasCst_IRR_lo
OtherGrainC4_TexasCst_RFD_hi
OtherGrainC4_TexasCst_RFD_lo
OtherGrainC4_ThaiGulf_RFD_hi
OtherGrainC4_ThaiGulf_RFD_lo
OtherGrainC4_TiberR_RFD_hi
OtherGrainC4_TiberR_RFD_lo
OtherGrainC4_TigrEuphR_RFD_hi
OtherGrainC4_TigrEuphR_RFD_lo
OtherGrainC4_TocantinsR_RFD_hi
OtherGrainC4_TocantinsR_RFD_lo
OtherGrainC4_UralR_IRR_hi
OtherGrainC4_UralR_IRR_lo
OtherGrainC4_UralR_RFD_hi
OtherGrainC4_UralR_RFD_lo
OtherGrainC4_UsaColoRN_IRR_hi
OtherGrainC4_UsaColoRN_IRR_lo
OtherGrainC4_UsaColoRN_RFD_hi
OtherGrainC4_UsaColoRN_RFD_lo
OtherGrainC4_UsaColoRS_IRR_hi
OtherGrainC4_UsaColoRS_IRR_lo
OtherGrainC4_UsaColoRS_RFD_hi
OtherGrainC4_UsaColoRS_RFD_lo
OtherGrainC4_UsaCstE_IRR_hi
OtherGrainC4_UsaCstE_IRR_lo
OtherGrainC4_UsaCstE_RFD_hi
OtherGrainC4_UsaCstE_RFD_lo
OtherGrainC4_UsaCstSE_IRR_hi
OtherGrainC4_UsaCstSE_IRR_lo
OtherGrainC4_UsaCstSE_RFD_hi
OtherGrainC4_UsaCstSE_RFD_lo
OtherGrainC4_UsaPacNW_IRR_hi
OtherGrainC4_UsaPacNW_IRR_lo
OtherGrainC4_UsaPacNW_RFD_hi
OtherGrainC4_UsaPacNW_RFD_lo
OtherGrainC4_VietnamCst_RFD_hi
OtherGrainC4_VietnamCst_RFD_lo
OtherGrainC4_VolgaR_IRR_hi
OtherGrainC4_VolgaR_IRR_lo
OtherGrainC4_VolgaR_RFD_hi
OtherGrainC4_VolgaR_RFD_lo
OtherGrainC4_VoltaR_RFD_hi
OtherGrainC4_VoltaR_RFD_lo
OtherGrainC4_WislaR_RFD_hi
OtherGrainC4_WislaR_RFD_lo
OtherGrainC4_XunJiang_IRR_hi
OtherGrainC4_XunJiang_IRR_lo
OtherGrainC4_XunJiang_RFD_hi
OtherGrainC4_XunJiang_RFD_lo
OtherGrainC4_Yangtze_IRR_hi
OtherGrainC4_Yangtze_IRR_lo
OtherGrainC4_Yangtze_RFD_hi
OtherGrainC4_Yangtze_RFD_lo
OtherGrainC4_YeniseiR_IRR_hi
OtherGrainC4_YeniseiR_IRR_lo
OtherGrainC4_YeniseiR_RFD_hi
OtherGrainC4_YeniseiR_RFD_lo
OtherGrainC4_YucatanP_IRR_hi
OtherGrainC4_YucatanP_IRR_lo
OtherGrainC4_YucatanP_RFD_hi
OtherGrainC4_YucatanP_RFD_lo
OtherGrainC4_ZambeziR_IRR_hi
OtherGrainC4_ZambeziR_IRR_lo
OtherGrainC4_ZambeziR_RFD_hi
OtherGrainC4_ZambeziR_RFD_lo
OtherGrainC4_ZiyaHe_IRR_hi
OtherGrainC4_ZiyaHe_IRR_lo
OtherGrainC4_ZiyaHe_RFD_hi
OtherGrainC4_ZiyaHe_RFD_lo
Pasture_FodderGrass
ProtectedDeforest_AdrBlkSea
ProtectedDeforest_AmazonR
ProtectedDeforest_AmuDaryaR
ProtectedDeforest_ArgCstS
ProtectedDeforest_BengalBay
ProtectedDeforest_BlackSeaN
ProtectedDeforest_BlackSeaS
ProtectedDeforest_BoHai
ProtectedDeforest_BorneoCstN
ProtectedDeforest_CaspianNE
ProtectedDeforest_CaspianSW
ProtectedDeforest_ChaoPhrR
ProtectedDeforest_ChileCstN
ProtectedDeforest_ChileCstS
ProtectedDeforest_ChurchillR
ProtectedDeforest_CntAmer
ProtectedDeforest_ColEcuaCst
ProtectedDeforest_DanubeR

ProtectedDeforest_DnkGrmCst
ProtectedDeforest_FlyR
ProtectedDeforest_FraserR
ProtectedDeforest_GangesR
ProtectedDeforest_Gobi
ProtectedDeforest_GrijUsuR
ProtectedDeforest_Hong
ProtectedDeforest_IrianJaya
ProtectedDeforest_IrrawaddyR
ProtectedDeforest_Japan
ProtectedDeforest_JavaTimor
ProtectedDeforest_Kalimantan
ProtectedDeforest_KaraSea
ProtectedDeforest_Korea
ProtectedDeforest_LaPuna
ProtectedDeforest_LenaR
ProtectedDeforest_MalaysiaP
ProtectedDeforest_MeditE
ProtectedDeforest_Mekong
ProtectedDeforest_MexBaja
ProtectedDeforest_MexCstNW
ProtectedDeforest_MexCstW
ProtectedDeforest_MexGulf
ProtectedDeforest_MexInt
ProtectedDeforest_NegroR
ProtectedDeforest_NemanR
ProtectedDeforest_NewCaledn
ProtectedDeforest_ObR
ProtectedDeforest_PacArctic
ProtectedDeforest_Papaloapan
ProtectedDeforest_PapuaCst
ProtectedDeforest_PeruCst
ProtectedDeforest_Phlppns
ProtectedDeforest_PoR
ProtectedDeforest_RhineR
ProtectedDeforest_RhoneR
ProtectedDeforest_RioBalsas
ProtectedDeforest_RioGrande
ProtectedDeforest_RioLaPlata
ProtectedDeforest_RioLerma
ProtectedDeforest_RioVerde
ProtectedDeforest_RusCstSE
ProtectedDeforest_Salween
ProtectedDeforest_SChinaSea
ProtectedDeforest_ScndnvN
ProtectedDeforest_SepikR
ProtectedDeforest_SittaungR
ProtectedDeforest_SolomonIsl
ProtectedDeforest_SriLanka
ProtectedDeforest_Taiwan
ProtectedDeforest_Tehuantpc
ProtectedDeforest_ThaiGulf
ProtectedDeforest_TigrEuphR
ProtectedDeforest_VietnamCst
ProtectedDeforest_YeniseiR
ProtectedDeforest_YucatanP
ProtectedForestFire_AdrBlkSea
ProtectedForestFire_AfrCstW
ProtectedForestFire_AmazonR
ProtectedForestFire_AmuDaryaR
ProtectedForestFire_AmurR
ProtectedForestFire_ArgColoR
ProtectedForestFire_ArgCstS
ProtectedForestFire_ArkWhtRedR
ProtectedForestFire_AusCstE
ProtectedForestFire_AusCstN
ProtectedForestFire_AusCstS
ProtectedForestFire_AusCstW
ProtectedForestFire_BalticSea
ProtectedForestFire_BarentsSea
ProtectedForestFire_BengalBay
ProtectedForestFire_BlackSeaN
ProtectedForestFire_BlackSeaS
ProtectedForestFire_BoHai
ProtectedForestFire_BorneoCstN
ProtectedForestFire_BrzCstE
ProtectedForestFire_BrzCstN
ProtectedForestFire_BrzCstS
ProtectedForestFire_California
ProtectedForestFire_CanAtl
ProtectedForestFire_Caribbean
ProtectedForestFire_CaspianNE
ProtectedForestFire_CaspianSW
ProtectedForestFire_ChaoPhrR
ProtectedForestFire_ChileCstN
ProtectedForestFire_ChileCstS
ProtectedForestFire_ChinaCst
ProtectedForestFire_ChurchillR
ProtectedForestFire_CntAmer
ProtectedForestFire_ColEcuaCst
ProtectedForestFire_CongoR
ProtectedForestFire_DanubeR
ProtectedForestFire_DaugavaR
ProtectedForestFire_DnieperR
ProtectedForestFire_DniesterR
ProtectedForestFire_DnkGrmCst

ProtectedForestFire_DonR
ProtectedForestFire_DvinaRN
ProtectedForestFire_ElbeR
ProtectedForestFire_Finland
ProtectedForestFire_FlyR
ProtectedForestFire_FraserR
ProtectedForestFire_GangesR
ProtectedForestFire_Gobi
ProtectedForestFire_GreatBasin
ProtectedForestFire_GreatLakes
ProtectedForestFire_GrijUsuR
ProtectedForestFire_GuineaGulf
ProtectedForestFire_Hong
ProtectedForestFire_HudsonBay
ProtectedForestFire_Iceland
ProtectedForestFire_IdnE
ProtectedForestFire_IrianJaya
ProtectedForestFire_IrrawaddyR
ProtectedForestFire_Japan
ProtectedForestFire_JavaTimor
ProtectedForestFire_Kalimantan
ProtectedForestFire_KaraSea
ProtectedForestFire_Korea
ProtectedForestFire_LaPuna
ProtectedForestFire_LBalkash
ProtectedForestFire_LChad
ProtectedForestFire_LenaR
ProtectedForestFire_Mackenzie
ProtectedForestFire_MalaysiaP
ProtectedForestFire_MarChiq
ProtectedForestFire_MeditE
ProtectedForestFire_Mekong
ProtectedForestFire_MexBaja
ProtectedForestFire_MexCstNW
ProtectedForestFire_MexCstW
ProtectedForestFire_MexGulf
ProtectedForestFire_MexInt
ProtectedForestFire_MissouriR
ProtectedForestFire_MissppRN
ProtectedForestFire_MissppRS
ProtectedForestFire_MurrayDrlg
ProtectedForestFire_NarvaR
ProtectedForestFire_NegroR
ProtectedForestFire_NelsonR
ProtectedForestFire_NemanR
ProtectedForestFire_NevaR
ProtectedForestFire_NewCaledn
ProtectedForestFire_NewZealand
ProtectedForestFire_NigerR
ProtectedForestFire_NileR
ProtectedForestFire_NWTerr
ProtectedForestFire_ObR
ProtectedForestFire_OderR
ProtectedForestFire_OhioR
ProtectedForestFire_OrinocoR
ProtectedForestFire_PacArctic
ProtectedForestFire_Pampas
ProtectedForestFire_Papaloapan
ProtectedForestFire_PapuaCst
ProtectedForestFire_ParnaibaR
ProtectedForestFire_Patagonia
ProtectedForestFire_PeruCst
ProtectedForestFire_Phlppns
ProtectedForestFire_PolandCst
ProtectedForestFire_PoR
ProtectedForestFire_RhineR
ProtectedForestFire_RhoneR
ProtectedForestFire_RioBalsas
ProtectedForestFire_RioGrande
ProtectedForestFire_RioLaPlata
ProtectedForestFire_RioLerma
ProtectedForestFire_RioVerde
ProtectedForestFire_RusCstSE
ProtectedForestFire_Salinas
ProtectedForestFire_Salween
ProtectedForestFire_SAmerCstN
ProtectedForestFire_SAmerCstNE
ProtectedForestFire_SaoFrancR
ProtectedForestFire_SChinaSea
ProtectedForestFire_ScndnvN
ProtectedForestFire_SenegalR
ProtectedForestFire_SepikR
ProtectedForestFire_SiberiaN
ProtectedForestFire_SiberiaW
ProtectedForestFire_SittaungR
ProtectedForestFire_SolomonIsl
ProtectedForestFire_SriLanka
ProtectedForestFire_StLwrncR
ProtectedForestFire_Sweden
ProtectedForestFire_SyrDaryaR
ProtectedForestFire_Taiwan
ProtectedForestFire_Tasmania
ProtectedForestFire_Tehuantpc
ProtectedForestFire_TennR
ProtectedForestFire_TexasCst
ProtectedForestFire_ThaiGulf

ProtectedForestFire_TigrEuphR
ProtectedForestFire_TocantinsR
ProtectedForestFire_UralR
ProtectedForestFire_UsaColoRN
ProtectedForestFire_UsaColoRS
ProtectedForestFire_UsaCstE
ProtectedForestFire_UsaCstNE
ProtectedForestFire_UsaCstSE
ProtectedForestFire_UsaPacNW
ProtectedForestFire_VietnamCst
ProtectedForestFire_VolgaR
ProtectedForestFire_VoltaR
ProtectedForestFire_WislaR
ProtectedForestFire_XunJiang
ProtectedForestFire_YeniseiR
ProtectedForestFire_YucatanP
ProtectedForestFire_ZambeziR
ProtectedGrasslandFires_AdnNicIsl
ProtectedGrasslandFires_AdrBlkSea
ProtectedGrasslandFires_AfrCstE
ProtectedGrasslandFires_AfrCstNE
ProtectedGrasslandFires_AfrCstNW
ProtectedGrasslandFires_AfrCstS
ProtectedGrasslandFires_AfrCstSE
ProtectedGrasslandFires_AfrCstSSW
ProtectedGrasslandFires_AfrCstSW
ProtectedGrasslandFires_AfrCstW
ProtectedGrasslandFires_AfrIntN
ProtectedGrasslandFires_AfrIntS
ProtectedGrasslandFires_AmazonR
ProtectedGrasslandFires_AmuDaryaR
ProtectedGrasslandFires_AmurR
ProtectedGrasslandFires_AngolaCst
ProtectedGrasslandFires_ArabianP
ProtectedGrasslandFires_ArabianSea
ProtectedGrasslandFires_ArcticIsl
ProtectedGrasslandFires_ArgColoR
ProtectedGrasslandFires_ArgCstN
ProtectedGrasslandFires_ArgCstS
ProtectedGrasslandFires_ArkWhtRedR
ProtectedGrasslandFires_AusCstE
ProtectedGrasslandFires_AusCstN
ProtectedGrasslandFires_AusCstS
ProtectedGrasslandFires_AusCstW
ProtectedGrasslandFires_AusInt
ProtectedGrasslandFires_BalticSea
ProtectedGrasslandFires_BarentsSea
ProtectedGrasslandFires_BengalBay
ProtectedGrasslandFires_BengalW
ProtectedGrasslandFires_BlackSeaN
ProtectedGrasslandFires_BlackSeaS
ProtectedGrasslandFires_BoHai
ProtectedGrasslandFires_BorneoCstN
ProtectedGrasslandFires_BrahmaniR
ProtectedGrasslandFires_BrzCstE
ProtectedGrasslandFires_BrzCstN
ProtectedGrasslandFires_BrzCstS
ProtectedGrasslandFires_California
ProtectedGrasslandFires_CanAtl
ProtectedGrasslandFires_Caribbean
ProtectedGrasslandFires_CaspianE
ProtectedGrasslandFires_CaspianNE
ProtectedGrasslandFires_CaspianSW
ProtectedGrasslandFires_CauveryR
ProtectedGrasslandFires_ChaoPhrR
ProtectedGrasslandFires_ChileCstN
ProtectedGrasslandFires_ChileCstS
ProtectedGrasslandFires_ChinaCst
ProtectedGrasslandFires_ChurchillR
ProtectedGrasslandFires_CntAmer
ProtectedGrasslandFires_ColEcuaCst
ProtectedGrasslandFires_CongoR
ProtectedGrasslandFires_DanubeR
ProtectedGrasslandFires_DaugavaR
ProtectedGrasslandFires_DeadSea
ProtectedGrasslandFires_DnieperR
ProtectedGrasslandFires_DniesterR
ProtectedGrasslandFires_DnkGrmCst
ProtectedGrasslandFires_DonR
ProtectedGrasslandFires_DouroR
ProtectedGrasslandFires_DvinaRN
ProtectedGrasslandFires_EbroR
ProtectedGrasslandFires_EJrdnSyr
ProtectedGrasslandFires_ElbeR
ProtectedGrasslandFires_EmsWeserR
ProtectedGrasslandFires_EngWales
ProtectedGrasslandFires_FarahrudR
ProtectedGrasslandFires_Finland
ProtectedGrasslandFires_FlyR
ProtectedGrasslandFires_FranceCstS
ProtectedGrasslandFires_FranceCstW
ProtectedGrasslandFires_FraserR
ProtectedGrasslandFires_GangesR
ProtectedGrasslandFires_Gironde
ProtectedGrasslandFires_Gobi
ProtectedGrasslandFires_GodavariR

ProtectedGrasslandFires_GreatBasin
ProtectedGrasslandFires_GreatLakes
ProtectedGrasslandFires_GrijUsuR
ProtectedGrasslandFires_GuadalqR
ProtectedGrasslandFires_GuadianaR
ProtectedGrasslandFires_GuineaGulf
ProtectedGrasslandFires_Hainan
ProtectedGrasslandFires_HamuMashR
ProtectedGrasslandFires_Hawaii
ProtectedGrasslandFires_Helmand
ProtectedGrasslandFires_Hong
ProtectedGrasslandFires_HuangHeR
ProtectedGrasslandFires_HudsonBay
ProtectedGrasslandFires_IberiaCst
ProtectedGrasslandFires_Iceland
ProtectedGrasslandFires_IdnE
ProtectedGrasslandFires_IndCstE
ProtectedGrasslandFires_IndCstNE
ProtectedGrasslandFires_IndCstS
ProtectedGrasslandFires_IndCstW
ProtectedGrasslandFires_IndusR
ProtectedGrasslandFires_Iran
ProtectedGrasslandFires_Ireland
ProtectedGrasslandFires_IrianJaya
ProtectedGrasslandFires_IrrawaddyR
ProtectedGrasslandFires_ItalyCstE
ProtectedGrasslandFires_ItalyCstW
ProtectedGrasslandFires_Japan
ProtectedGrasslandFires_JavaTimor
ProtectedGrasslandFires_Kalimantan
ProtectedGrasslandFires_KaraSea
ProtectedGrasslandFires_Korea
ProtectedGrasslandFires_KrishnaR
ProtectedGrasslandFires_LaPuna
ProtectedGrasslandFires_LBalkash
ProtectedGrasslandFires_LChad
ProtectedGrasslandFires_LenaR
ProtectedGrasslandFires_LimpopoR
ProtectedGrasslandFires_LoireR
ProtectedGrasslandFires_Mackenzie
ProtectedGrasslandFires_Madagascar
ProtectedGrasslandFires_MagdalenaR
ProtectedGrasslandFires_MahanadiR
ProtectedGrasslandFires_MahiR
ProtectedGrasslandFires_MalaysiaP
ProtectedGrasslandFires_MarChiq
ProtectedGrasslandFires_MeditE
ProtectedGrasslandFires_MeditIsl
ProtectedGrasslandFires_MeditS
ProtectedGrasslandFires_Mekong
ProtectedGrasslandFires_MexBaja
ProtectedGrasslandFires_MexCstNW
ProtectedGrasslandFires_MexCstW
ProtectedGrasslandFires_MexGulf
ProtectedGrasslandFires_MexInt
ProtectedGrasslandFires_MissouriR
ProtectedGrasslandFires_MissppRN
ProtectedGrasslandFires_MissppRS
ProtectedGrasslandFires_MurrayDrlg
ProtectedGrasslandFires_NarmadaR
ProtectedGrasslandFires_NarvaR
ProtectedGrasslandFires_NegroR
ProtectedGrasslandFires_NelsonR
ProtectedGrasslandFires_NemanR
ProtectedGrasslandFires_NevaR
ProtectedGrasslandFires_NewCaledn
ProtectedGrasslandFires_NewZealand
ProtectedGrasslandFires_NigerR
ProtectedGrasslandFires_NileR
ProtectedGrasslandFires_NWTerr
ProtectedGrasslandFires_ObR
ProtectedGrasslandFires_OderR
ProtectedGrasslandFires_OhioR
ProtectedGrasslandFires_OrangeR
ProtectedGrasslandFires_OrinocoR
ProtectedGrasslandFires_PacArctic
ProtectedGrasslandFires_Pampas
ProtectedGrasslandFires_Papaloapan
ProtectedGrasslandFires_PapuaCst
ProtectedGrasslandFires_ParnaibaR
ProtectedGrasslandFires_Patagonia
ProtectedGrasslandFires_PennarR
ProtectedGrasslandFires_PersianGulf
ProtectedGrasslandFires_PeruCst
ProtectedGrasslandFires_Phlppns
ProtectedGrasslandFires_PolandCst
ProtectedGrasslandFires_PoR
ProtectedGrasslandFires_RedSeaE
ProtectedGrasslandFires_RhineR
ProtectedGrasslandFires_RhoneR
ProtectedGrasslandFires_RiftValley
ProtectedGrasslandFires_RioBalsas
ProtectedGrasslandFires_RioGrande
ProtectedGrasslandFires_RioLaPlata
ProtectedGrasslandFires_RioLerma
ProtectedGrasslandFires_RioVerde

ProtectedGrasslandFires_RusCstSE
ProtectedGrasslandFires_SabarmatiR
ProtectedGrasslandFires_Salinas
ProtectedGrasslandFires_Salween
ProtectedGrasslandFires_SAmerCstN
ProtectedGrasslandFires_SAmerCstNE
ProtectedGrasslandFires_SaoFrancR
ProtectedGrasslandFires_ScheldtR
ProtectedGrasslandFires_SChinaSea
ProtectedGrasslandFires_ScndnvN
ProtectedGrasslandFires_Scotland
ProtectedGrasslandFires_SeineR
ProtectedGrasslandFires_SenegalR
ProtectedGrasslandFires_SepikR
ProtectedGrasslandFires_ShebJubR
ProtectedGrasslandFires_SiberiaN
ProtectedGrasslandFires_SiberiaW
ProtectedGrasslandFires_SittaungR
ProtectedGrasslandFires_SolomonIsl
ProtectedGrasslandFires_SpainCstSE
ProtectedGrasslandFires_SriLanka
ProtectedGrasslandFires_StLwrncR
ProtectedGrasslandFires_Sulawesi
ProtectedGrasslandFires_Sumatra
ProtectedGrasslandFires_Sweden
ProtectedGrasslandFires_SyrDaryaR
ProtectedGrasslandFires_TagusR
ProtectedGrasslandFires_Taiwan
ProtectedGrasslandFires_TaptiR
ProtectedGrasslandFires_Tarim
ProtectedGrasslandFires_Tasmania
ProtectedGrasslandFires_Tehuantpc
ProtectedGrasslandFires_TennR
ProtectedGrasslandFires_TexasCst
ProtectedGrasslandFires_ThaiGulf
ProtectedGrasslandFires_TiberR
ProtectedGrasslandFires_Tibet
ProtectedGrasslandFires_TigrEuphR
ProtectedGrasslandFires_TocantinsR
ProtectedGrasslandFires_UralR
ProtectedGrasslandFires_UsaColoRN
ProtectedGrasslandFires_UsaColoRS
ProtectedGrasslandFires_UsaCstE
ProtectedGrasslandFires_UsaCstNE
ProtectedGrasslandFires_UsaCstSE
ProtectedGrasslandFires_UsaPacNW
ProtectedGrasslandFires_VietnamCst
ProtectedGrasslandFires_VolgaR
ProtectedGrasslandFires_VoltaR
ProtectedGrasslandFires_WislaR
ProtectedGrasslandFires_XunJiang
ProtectedGrasslandFires_Yangtze
ProtectedGrasslandFires_YeniseiR
ProtectedGrasslandFires_YucatanP
ProtectedGrasslandFires_ZambeziR
ProtectedGrasslandFires_ZiyaHe
refined liquids
refined liquids (CC CCS)
refined liquids (CC)
refined liquids (steam/CT)
Rice_AdrBlkSea_IRR_hi
Rice_AdrBlkSea_IRR_lo
Rice_AdrBlkSea_RFD_hi
Rice_AdrBlkSea_RFD_lo
Rice_AfrCstE_IRR_hi
Rice_AfrCstE_IRR_lo
Rice_AfrCstE_RFD_hi
Rice_AfrCstE_RFD_lo
Rice_AfrCstNE_IRR_hi
Rice_AfrCstNE_IRR_lo
Rice_AfrCstNE_RFD_hi
Rice_AfrCstNE_RFD_lo
Rice_AfrCstNW_IRR_hi
Rice_AfrCstNW_IRR_lo
Rice_AfrCstNW_RFD_hi
Rice_AfrCstNW_RFD_lo
Rice_AfrCstS_IRR_hi
Rice_AfrCstS_IRR_lo
Rice_AfrCstS_RFD_hi
Rice_AfrCstS_RFD_lo
Rice_AfrCstSE_IRR_hi
Rice_AfrCstSE_IRR_lo
Rice_AfrCstSE_RFD_hi
Rice_AfrCstSE_RFD_lo
Rice_AfrCstSSW_IRR_hi
Rice_AfrCstSSW_IRR_lo
Rice_AfrCstW_IRR_hi
Rice_AfrCstW_IRR_lo
Rice_AfrCstW_RFD_hi
Rice_AfrCstW_RFD_lo
Rice_AfrIntN_IRR_hi
Rice_AfrIntN_IRR_lo
Rice_AfrIntN_RFD_hi
Rice_AfrIntN_RFD_lo
Rice_AfrIntS_IRR_hi
Rice_AfrIntS_IRR_lo

Rice_AfrIntS_RFD_hi
Rice_AfrIntS_RFD_lo
Rice_AmazonR_IRR_hi
Rice_AmazonR_IRR_lo
Rice_AmazonR_RFD_hi
Rice_AmazonR_RFD_lo
Rice_AmuDaryaR_IRR_hi
Rice_AmuDaryaR_IRR_lo
Rice_AmuDaryaR_RFD_hi
Rice_AmuDaryaR_RFD_lo
Rice_AmurR_IRR_hi
Rice_AmurR_IRR_lo
Rice_AmurR_RFD_hi
Rice_AmurR_RFD_lo
Rice_AngolaCst_IRR_hi
Rice_AngolaCst_IRR_lo
Rice_ArabianSea_IRR_hi
Rice_ArabianSea_IRR_lo
Rice_ArgColoR_RFD_hi
Rice_ArgColoR_RFD_lo
Rice_ArgCstN_RFD_hi
Rice_ArgCstN_RFD_lo
Rice_ArkWhtRedR_IRR_hi
Rice_ArkWhtRedR_IRR_lo
Rice_ArkWhtRedR_RFD_hi
Rice_ArkWhtRedR_RFD_lo
Rice_AusCstE_IRR_hi
Rice_AusCstE_IRR_lo
Rice_AusCstE_RFD_hi
Rice_AusCstE_RFD_lo
Rice_BengalBay_IRR_hi
Rice_BengalBay_IRR_lo
Rice_BengalBay_RFD_hi
Rice_BengalBay_RFD_lo
Rice_BengalW_IRR_hi
Rice_BengalW_IRR_lo
Rice_BengalW_RFD_hi
Rice_BengalW_RFD_lo
Rice_BlackSeaN_IRR_hi
Rice_BlackSeaN_IRR_lo
Rice_BlackSeaN_RFD_hi
Rice_BlackSeaN_RFD_lo
Rice_BlackSeaS_IRR_hi
Rice_BlackSeaS_IRR_lo
Rice_BoHai_IRR_hi
Rice_BoHai_IRR_lo
Rice_BoHai_RFD_hi
Rice_BoHai_RFD_lo
Rice_BorneoCstN_IRR_hi
Rice_BorneoCstN_IRR_lo
Rice_BorneoCstN_RFD_hi
Rice_BorneoCstN_RFD_lo
Rice_BrahmaniR_IRR_hi
Rice_BrahmaniR_IRR_lo
Rice_BrahmaniR_RFD_hi
Rice_BrahmaniR_RFD_lo
Rice_BrzCstE_IRR_hi
Rice_BrzCstE_IRR_lo
Rice_BrzCstE_RFD_hi
Rice_BrzCstE_RFD_lo
Rice_BrzCstN_IRR_hi
Rice_BrzCstN_IRR_lo
Rice_BrzCstN_RFD_hi
Rice_BrzCstN_RFD_lo
Rice_BrzCstS_IRR_hi
Rice_BrzCstS_IRR_lo
Rice_BrzCstS_RFD_hi
Rice_BrzCstS_RFD_lo
Rice_California_IRR_hi
Rice_California_IRR_lo
Rice_Caribbean_IRR_hi
Rice_Caribbean_IRR_lo
Rice_Caribbean_RFD_hi
Rice_Caribbean_RFD_lo
Rice_CaspianE_IRR_hi
Rice_CaspianE_IRR_lo
Rice_CaspianE_RFD_hi
Rice_CaspianE_RFD_lo
Rice_CaspianNE_IRR_hi
Rice_CaspianNE_IRR_lo
Rice_CaspianSW_IRR_hi
Rice_CaspianSW_IRR_lo
Rice_CaspianSW_RFD_hi
Rice_CaspianSW_RFD_lo
Rice_CauveryR_IRR_hi
Rice_CauveryR_IRR_lo
Rice_CauveryR_RFD_hi
Rice_CauveryR_RFD_lo
Rice_ChaoPhrR_IRR_hi
Rice_ChaoPhrR_IRR_lo
Rice_ChaoPhrR_RFD_hi
Rice_ChaoPhrR_RFD_lo
Rice_ChileCstN_IRR_hi
Rice_ChileCstN_IRR_lo
Rice_ChileCstS_IRR_hi
Rice_ChileCstS_IRR_lo

Rice_ChileCstS_RFD_hi
Rice_ChileCstS_RFD_lo
Rice_ChinaCst_IRR_hi
Rice_ChinaCst_IRR_lo
Rice_ChinaCst_RFD_hi
Rice_ChinaCst_RFD_lo
Rice_CntAmer_IRR_hi
Rice_CntAmer_IRR_lo
Rice_CntAmer_RFD_hi
Rice_CntAmer_RFD_lo
Rice_ColEcuaCst_IRR_hi
Rice_ColEcuaCst_IRR_lo
Rice_ColEcuaCst_RFD_hi
Rice_ColEcuaCst_RFD_lo
Rice_CongoR_IRR_hi
Rice_CongoR_IRR_lo
Rice_CongoR_RFD_hi
Rice_CongoR_RFD_lo
Rice_DanubeR_IRR_hi
Rice_DanubeR_IRR_lo
Rice_DanubeR_RFD_hi
Rice_DanubeR_RFD_lo
Rice_DnieperR_IRR_hi
Rice_DnieperR_IRR_lo
Rice_DnieperR_RFD_hi
Rice_DnieperR_RFD_lo
Rice_DniesterR_IRR_hi
Rice_DniesterR_IRR_lo
Rice_DniesterR_RFD_hi
Rice_DniesterR_RFD_lo
Rice_DonR_IRR_hi
Rice_DonR_IRR_lo
Rice_DonR_RFD_hi
Rice_DonR_RFD_lo
Rice_DouroR_IRR_hi
Rice_DouroR_IRR_lo
Rice_DouroR_RFD_hi
Rice_DouroR_RFD_lo
Rice_EbroR_IRR_hi
Rice_EbroR_IRR_lo
Rice_EbroR_RFD_hi
Rice_EbroR_RFD_lo
Rice_FarahrudR_IRR_hi
Rice_FarahrudR_IRR_lo
Rice_FarahrudR_RFD_hi
Rice_FarahrudR_RFD_lo
Rice_FlyR_RFD_hi
Rice_FlyR_RFD_lo
Rice_FranceCstS_IRR_hi
Rice_FranceCstS_IRR_lo
Rice_FranceCstS_RFD_hi
Rice_FranceCstS_RFD_lo
Rice_FranceCstW_RFD_hi
Rice_FranceCstW_RFD_lo
Rice_GangesR_IRR_hi
Rice_GangesR_IRR_lo
Rice_GangesR_RFD_hi
Rice_GangesR_RFD_lo
Rice_Gironde_IRR_hi
Rice_Gironde_IRR_lo
Rice_Gironde_RFD_hi
Rice_Gironde_RFD_lo
Rice_Gobi_IRR_hi
Rice_Gobi_IRR_lo
Rice_GodavariR_IRR_hi
Rice_GodavariR_IRR_lo
Rice_GodavariR_RFD_hi
Rice_GodavariR_RFD_lo
Rice_GrijUsuR_IRR_hi
Rice_GrijUsuR_IRR_lo
Rice_GrijUsuR_RFD_hi
Rice_GrijUsuR_RFD_lo
Rice_GuadalqR_IRR_hi
Rice_GuadalqR_IRR_lo
Rice_GuadianaR_IRR_hi
Rice_GuadianaR_IRR_lo
Rice_GuadianaR_RFD_hi
Rice_GuadianaR_RFD_lo
Rice_GuineaGulf_IRR_hi
Rice_GuineaGulf_IRR_lo
Rice_GuineaGulf_RFD_hi
Rice_GuineaGulf_RFD_lo
Rice_Hainan_IRR_hi
Rice_Hainan_IRR_lo
Rice_Hainan_RFD_hi
Rice_Hainan_RFD_lo
Rice_HamuMashR_IRR_hi
Rice_HamuMashR_IRR_lo
Rice_Helmand_IRR_hi
Rice_Helmand_IRR_lo
Rice_Helmand_RFD_hi
Rice_Helmand_RFD_lo
Rice_Hong_IRR_hi
Rice_Hong_IRR_lo
Rice_Hong_RFD_hi
Rice_Hong_RFD_lo

Rice_HuangHeR_IRR_hi
Rice_HuangHeR_IRR_lo
Rice_IberiaCst_IRR_hi
Rice_IberiaCst_IRR_lo
Rice_IberiaCst_RFD_hi
Rice_IberiaCst_RFD_lo
Rice_IdnE_IRR_hi
Rice_IdnE_IRR_lo
Rice_IdnE_RFD_hi
Rice_IdnE_RFD_lo
Rice_IndCstE_IRR_hi
Rice_IndCstE_IRR_lo
Rice_IndCstE_RFD_hi
Rice_IndCstE_RFD_lo
Rice_IndCstNE_IRR_hi
Rice_IndCstNE_IRR_lo
Rice_IndCstNE_RFD_hi
Rice_IndCstNE_RFD_lo
Rice_IndCstS_IRR_hi
Rice_IndCstS_IRR_lo
Rice_IndCstS_RFD_hi
Rice_IndCstS_RFD_lo
Rice_IndCstW_IRR_hi
Rice_IndCstW_IRR_lo
Rice_IndCstW_RFD_hi
Rice_IndCstW_RFD_lo
Rice_IndusR_IRR_hi
Rice_IndusR_IRR_lo
Rice_IndusR_RFD_hi
Rice_IndusR_RFD_lo
Rice_Iran_IRR_hi
Rice_Iran_IRR_lo
Rice_IrianJaya_IRR_hi
Rice_IrianJaya_IRR_lo
Rice_IrianJaya_RFD_hi
Rice_IrianJaya_RFD_lo
Rice_IrrawaddyR_IRR_hi
Rice_IrrawaddyR_IRR_lo
Rice_IrrawaddyR_RFD_hi
Rice_IrrawaddyR_RFD_lo
Rice_ItalyCstE_IRR_hi
Rice_ItalyCstE_IRR_lo
Rice_ItalyCstE_RFD_hi
Rice_ItalyCstE_RFD_lo
Rice_ItalyCstW_IRR_hi
Rice_ItalyCstW_IRR_lo
Rice_ItalyCstW_RFD_hi
Rice_ItalyCstW_RFD_lo
Rice_Japan_IRR_hi
Rice_Japan_IRR_lo
Rice_JavaTimor_IRR_hi
Rice_JavaTimor_IRR_lo
Rice_JavaTimor_RFD_hi
Rice_JavaTimor_RFD_lo
Rice_Kalimantan_IRR_hi
Rice_Kalimantan_IRR_lo
Rice_Kalimantan_RFD_hi
Rice_Kalimantan_RFD_lo
Rice_Korea_IRR_hi
Rice_Korea_IRR_lo
Rice_Korea_RFD_hi
Rice_Korea_RFD_lo
Rice_KrishnaR_IRR_hi
Rice_KrishnaR_IRR_lo
Rice_KrishnaR_RFD_hi
Rice_KrishnaR_RFD_lo
Rice_LaPuna_IRR_hi
Rice_LaPuna_IRR_lo
Rice_LaPuna_RFD_hi
Rice_LaPuna_RFD_lo
Rice_LBalkash_IRR_hi
Rice_LBalkash_IRR_lo
Rice_LBalkash_RFD_hi
Rice_LBalkash_RFD_lo
Rice_LChad_IRR_hi
Rice_LChad_IRR_lo
Rice_LChad_RFD_hi
Rice_LChad_RFD_lo
Rice_LimpopoR_IRR_hi
Rice_LimpopoR_IRR_lo
Rice_LimpopoR_RFD_hi
Rice_LimpopoR_RFD_lo
Rice_LoireR_IRR_hi
Rice_LoireR_IRR_lo
Rice_Madagascar_IRR_hi
Rice_Madagascar_IRR_lo
Rice_MagdalenaR_IRR_hi
Rice_MagdalenaR_IRR_lo
Rice_MagdalenaR_RFD_hi
Rice_MagdalenaR_RFD_lo
Rice_MahanadiR_IRR_hi
Rice_MahanadiR_IRR_lo
Rice_MahanadiR_RFD_hi
Rice_MahanadiR_RFD_lo
Rice_MahiR_IRR_hi
Rice_MahiR_IRR_lo

Rice_MahiR_RFD_hi
Rice_MahiR_RFD_lo
Rice_MalaysiaP_IRR_hi
Rice_MalaysiaP_IRR_lo
Rice_MalaysiaP_RFD_hi
Rice_MalaysiaP_RFD_lo
Rice_MarChiq_IRR_hi
Rice_MarChiq_IRR_lo
Rice_MarChiq_RFD_hi
Rice_MarChiq_RFD_lo
Rice_MeditE_IRR_hi
Rice_MeditE_IRR_lo
Rice_MeditIsl_IRR_hi
Rice_MeditIsl_IRR_lo
Rice_MeditIsl_RFD_hi
Rice_MeditIsl_RFD_lo
Rice_MeditS_IRR_hi
Rice_MeditS_IRR_lo
Rice_MeditS_RFD_hi
Rice_MeditS_RFD_lo
Rice_Mekong_IRR_hi
Rice_Mekong_IRR_lo
Rice_Mekong_RFD_hi
Rice_Mekong_RFD_lo
Rice_MexCstNW_IRR_hi
Rice_MexCstNW_IRR_lo
Rice_MexCstNW_RFD_hi
Rice_MexCstNW_RFD_lo
Rice_MexCstW_IRR_hi
Rice_MexCstW_IRR_lo
Rice_MexCstW_RFD_hi
Rice_MexCstW_RFD_lo
Rice_MexGulf_IRR_hi
Rice_MexGulf_IRR_lo
Rice_MexGulf_RFD_hi
Rice_MexGulf_RFD_lo
Rice_MisspRN_IRR_hi
Rice_MisspRN_IRR_lo
Rice_MisspRN_RFD_hi
Rice_MisspRN_RFD_lo
Rice_MisspRS_IRR_hi
Rice_MisspRS_IRR_lo
Rice_MisspRS_RFD_hi
Rice_MisspRS_RFD_lo
Rice_MurrayDrlg_IRR_hi
Rice_MurrayDrlg_IRR_lo
Rice_MurrayDrlg_RFD_hi
Rice_MurrayDrlg_RFD_lo
Rice_NarmadaR_IRR_hi
Rice_NarmadaR_IRR_lo
Rice_NarmadaR_RFD_hi
Rice_NarmadaR_RFD_lo
Rice_NegroR_RFD_hi
Rice_NegroR_RFD_lo
Rice_NewCaledn_RFD_hi
Rice_NewCaledn_RFD_lo
Rice_NigerR_IRR_hi
Rice_NigerR_IRR_lo
Rice_NigerR_RFD_hi
Rice_NigerR_RFD_lo
Rice_NileR_IRR_hi
Rice_NileR_IRR_lo
Rice_NileR_RFD_hi
Rice_NileR_RFD_lo
Rice_ObR_IRR_hi
Rice_ObR_IRR_lo
Rice_OrangeR_IRR_hi
Rice_OrangeR_IRR_lo
Rice_OrangeR_RFD_hi
Rice_OrangeR_RFD_lo
Rice_OrinocoR_IRR_hi
Rice_OrinocoR_IRR_lo
Rice_OrinocoR_RFD_hi
Rice_OrinocoR_RFD_lo
Rice_Pampas_IRR_hi
Rice_Pampas_IRR_lo
Rice_Pampas_RFD_hi
Rice_Pampas_RFD_lo
Rice_Papaloapan_IRR_hi
Rice_Papaloapan_IRR_lo
Rice_Papaloapan_RFD_hi
Rice_Papaloapan_RFD_lo
Rice_PapuaCst_RFD_hi
Rice_PapuaCst_RFD_lo
Rice_ParnaibaR_IRR_hi
Rice_ParnaibaR_IRR_lo
Rice_ParnaibaR_RFD_hi
Rice_ParnaibaR_RFD_lo
Rice_PennarR_IRR_hi
Rice_PennarR_IRR_lo
Rice_PennarR_RFD_hi
Rice_PennarR_RFD_lo
Rice_PersianGulf_IRR_hi
Rice_PersianGulf_IRR_lo
Rice_PeruCst_IRR_hi
Rice_PeruCst_IRR_lo

Rice_PeruCst_RFD_hi
Rice_PeruCst_RFD_lo
Rice_Phlppns_IRR_hi
Rice_Phlppns_IRR_lo
Rice_Phlppns_RFD_hi
Rice_Phlppns_RFD_lo
Rice_PoR_IRR_hi
Rice_PoR_IRR_lo
Rice_PoR_RFD_hi
Rice_PoR_RFD_lo
Rice_RhoneR_IRR_hi
Rice_RhoneR_IRR_lo
Rice_RhoneR_RFD_hi
Rice_RhoneR_RFD_lo
Rice_RiftValley_IRR_hi
Rice_RiftValley_IRR_lo
Rice_RiftValley_RFD_hi
Rice_RiftValley_RFD_lo
Rice_RioBalsas_IRR_hi
Rice_RioBalsas_IRR_lo
Rice_RioBalsas_RFD_hi
Rice_RioBalsas_RFD_lo
Rice_RioLaPlata_IRR_hi
Rice_RioLaPlata_IRR_lo
Rice_RioLaPlata_RFD_hi
Rice_RioLaPlata_RFD_lo
Rice_RioLerma_IRR_hi
Rice_RioLerma_IRR_lo
Rice_RioLerma_RFD_hi
Rice_RioLerma_RFD_lo
Rice_RioVerde_IRR_hi
Rice_RioVerde_IRR_lo
Rice_RioVerde_RFD_hi
Rice_RioVerde_RFD_lo
Rice_RusCstSE_IRR_hi
Rice_RusCstSE_IRR_lo
Rice_RusCstSE_RFD_hi
Rice_RusCstSE_RFD_lo
Rice_SabarmatiR_IRR_hi
Rice_SabarmatiR_IRR_lo
Rice_SabarmatiR_RFD_hi
Rice_SabarmatiR_RFD_lo
Rice_Salinas_RFD_hi
Rice_Salinas_RFD_lo
Rice_Salween_IRR_hi
Rice_Salween_IRR_lo
Rice_Salween_RFD_hi
Rice_Salween_RFD_lo
Rice_SAmerCstN_IRR_hi
Rice_SAmerCstN_IRR_lo
Rice_SAmerCstN_RFD_hi
Rice_SAmerCstN_RFD_lo
Rice_SAmerCstNE_IRR_hi
Rice_SAmerCstNE_IRR_lo
Rice_SAmerCstNE_RFD_hi
Rice_SAmerCstNE_RFD_lo
Rice_SaoFrancR_IRR_hi
Rice_SaoFrancR_IRR_lo
Rice_SaoFrancR_RFD_hi
Rice_SaoFrancR_RFD_lo
Rice_SChinaSea_IRR_hi
Rice_SChinaSea_IRR_lo
Rice_SChinaSea_RFD_hi
Rice_SChinaSea_RFD_lo
Rice_SenegalR_IRR_hi
Rice_SenegalR_IRR_lo
Rice_SenegalR_RFD_hi
Rice_SenegalR_RFD_lo
Rice_SepikR_RFD_hi
Rice_SepikR_RFD_lo
Rice_ShebJubR_IRR_hi
Rice_ShebJubR_IRR_lo
Rice_ShebJubR_RFD_hi
Rice_ShebJubR_RFD_lo
Rice_SinaiP_IRR_hi
Rice_SinaiP_IRR_lo
Rice_SittaungR_IRR_hi
Rice_SittaungR_IRR_lo
Rice_SittaungR_RFD_hi
Rice_SittaungR_RFD_lo
Rice_SolomonIsl_RFD_hi
Rice_SolomonIsl_RFD_lo
Rice_SpainCstSE_IRR_hi
Rice_SpainCstSE_IRR_lo
Rice_SpainCstSE_RFD_hi
Rice_SpainCstSE_RFD_lo
Rice_SriLanka_IRR_hi
Rice_SriLanka_IRR_lo
Rice_SriLanka_RFD_hi
Rice_SriLanka_RFD_lo
Rice_Sulawesi_IRR_hi
Rice_Sulawesi_IRR_lo
Rice_Sulawesi_RFD_hi
Rice_Sulawesi_RFD_lo
Rice_Sumatra_IRR_hi
Rice_Sumatra_IRR_lo

Rice_Sumatra_RFD_hi
Rice_Sumatra_RFD_lo
Rice_SyrDaryaR_IRR_hi
Rice_SyrDaryaR_IRR_lo
Rice_SyrDaryaR_RFD_hi
Rice_SyrDaryaR_RFD_lo
Rice_TagusR_IRR_hi
Rice_TagusR_IRR_lo
Rice_TagusR_RFD_hi
Rice_TagusR_RFD_lo
Rice_Taiwan_IRR_hi
Rice_Taiwan_IRR_lo
Rice_TaptiR_IRR_hi
Rice_TaptiR_IRR_lo
Rice_TaptiR_RFD_hi
Rice_TaptiR_RFD_lo
Rice_Tarim_IRR_hi
Rice_Tarim_IRR_lo
Rice_Tarim_RFD_hi
Rice_Tarim_RFD_lo
Rice_Tehuantpc_IRR_hi
Rice_Tehuantpc_IRR_lo
Rice_Tehuantpc_RFD_hi
Rice_Tehuantpc_RFD_lo
Rice_TexasCst_IRR_hi
Rice_TexasCst_IRR_lo
Rice_TexasCst_RFD_hi
Rice_TexasCst_RFD_lo
Rice_ThaiGulf_IRR_hi
Rice_ThaiGulf_IRR_lo
Rice_ThaiGulf_RFD_hi
Rice_ThaiGulf_RFD_lo
Rice_TiberR_IRR_hi
Rice_TiberR_IRR_lo
Rice_TigrEuphR_IRR_hi
Rice_TigrEuphR_IRR_lo
Rice_TocantinsR_IRR_hi
Rice_TocantinsR_IRR_lo
Rice_TocantinsR_RFD_hi
Rice_TocantinsR_RFD_lo
Rice_UsaCstSE_IRR_hi
Rice_UsaCstSE_IRR_lo
Rice_UsaCstSE_RFD_hi
Rice_UsaCstSE_RFD_lo
Rice_VietnamCst_IRR_hi
Rice_VietnamCst_IRR_lo
Rice_VietnamCst_RFD_hi
Rice_VietnamCst_RFD_lo
Rice_VolgaR_IRR_hi
Rice_VolgaR_IRR_lo
Rice_VoltaR_IRR_hi
Rice_VoltaR_IRR_lo
Rice_VoltaR_RFD_hi
Rice_VoltaR_RFD_lo
Rice_WislaR_IRR_hi
Rice_WislaR_IRR_lo
Rice_WislaR_RFD_hi
Rice_WislaR_RFD_lo
Rice_XunJiang_IRR_hi
Rice_XunJiang_IRR_lo
Rice_XunJiang_RFD_hi
Rice_XunJiang_RFD_lo
Rice_Yangtze_IRR_hi
Rice_Yangtze_IRR_lo
Rice_Yangtze_RFD_hi
Rice_Yangtze_RFD_lo
Rice_YeniseiR_IRR_hi
Rice_YeniseiR_IRR_lo
Rice_YucatanP_IRR_hi
Rice_YucatanP_IRR_lo
Rice_YucatanP_RFD_hi
Rice_YucatanP_RFD_lo
Rice_ZambeziR_IRR_hi
Rice_ZambeziR_IRR_lo
Rice_ZambeziR_RFD_hi
Rice_ZambeziR_RFD_lo
Rice_ZiyaHe_IRR_hi
Rice_ZiyaHe_IRR_lo
Rice_ZiyaHe_RFD_hi
Rice_ZiyaHe_RFD_lo
RootTuber_AdrBlkSea_IRR_hi
RootTuber_AdrBlkSea_IRR_lo
RootTuber_AdrBlkSea_RFD_hi
RootTuber_AdrBlkSea_RFD_lo
RootTuber_AfrCstE_IRR_hi
RootTuber_AfrCstE_IRR_lo
RootTuber_AfrCstE_RFD_hi
RootTuber_AfrCstE_RFD_lo
RootTuber_AfrCstNE_IRR_hi
RootTuber_AfrCstNE_IRR_lo
RootTuber_AfrCstNE_RFD_hi
RootTuber_AfrCstNE_RFD_lo
RootTuber_AfrCstNW_IRR_hi
RootTuber_AfrCstNW_IRR_lo
RootTuber_AfrCstNW_RFD_hi
RootTuber_AfrCstNW_RFD_lo

RootTuber_AfrCstS_IRR_hi
RootTuber_AfrCstS_IRR_lo
RootTuber_AfrCstS_RFD_hi
RootTuber_AfrCstS_RFD_lo
RootTuber_AfrCstSE_IRR_hi
RootTuber_AfrCstSE_IRR_lo
RootTuber_AfrCstSE_RFD_hi
RootTuber_AfrCstSE_RFD_lo
RootTuber_AfrCstSSW_IRR_hi
RootTuber_AfrCstSSW_IRR_lo
RootTuber_AfrCstSSW_RFD_hi
RootTuber_AfrCstSSW_RFD_lo
RootTuber_AfrCstSW_IRR_hi
RootTuber_AfrCstSW_IRR_lo
RootTuber_AfrCstSW_RFD_hi
RootTuber_AfrCstSW_RFD_lo
RootTuber_AfrCstW_IRR_hi
RootTuber_AfrCstW_IRR_lo
RootTuber_AfrCstW_RFD_hi
RootTuber_AfrCstW_RFD_lo
RootTuber_AfrIntN_IRR_hi
RootTuber_AfrIntN_IRR_lo
RootTuber_AfrIntN_RFD_hi
RootTuber_AfrIntN_RFD_lo
RootTuber_AfrIntS_IRR_hi
RootTuber_AfrIntS_IRR_lo
RootTuber_AfrIntS_RFD_hi
RootTuber_AfrIntS_RFD_lo
RootTuber_AmazonR_IRR_hi
RootTuber_AmazonR_IRR_lo
RootTuber_AmazonR_RFD_hi
RootTuber_AmazonR_RFD_lo
RootTuber_AmuDaryaR_IRR_hi
RootTuber_AmuDaryaR_IRR_lo
RootTuber_AmuDaryaR_RFD_hi
RootTuber_AmuDaryaR_RFD_lo
RootTuber_AmurR_IRR_hi
RootTuber_AmurR_IRR_lo
RootTuber_AmurR_RFD_hi
RootTuber_AmurR_RFD_lo
RootTuber_AngolaCst_IRR_hi
RootTuber_AngolaCst_IRR_lo
RootTuber_AngolaCst_RFD_hi
RootTuber_AngolaCst_RFD_lo
RootTuber_ArabianP_IRR_hi
RootTuber_ArabianP_IRR_lo
RootTuber_ArabianP_RFD_hi
RootTuber_ArabianP_RFD_lo
RootTuber_ArabianSea_IRR_hi
RootTuber_ArabianSea_IRR_lo
RootTuber_ArabianSea_RFD_hi
RootTuber_ArabianSea_RFD_lo
RootTuber_ArgColoR_IRR_hi
RootTuber_ArgColoR_IRR_lo
RootTuber_ArgColoR_RFD_hi
RootTuber_ArgColoR_RFD_lo
RootTuber_ArgCstN_IRR_hi
RootTuber_ArgCstN_IRR_lo
RootTuber_ArgCstN_RFD_hi
RootTuber_ArgCstN_RFD_lo
RootTuber_ArgCstS_IRR_hi
RootTuber_ArgCstS_IRR_lo
RootTuber_ArgCstS_RFD_hi
RootTuber_ArgCstS_RFD_lo
RootTuber_ArkWhtRedR_IRR_hi
RootTuber_ArkWhtRedR_IRR_lo
RootTuber_ArkWhtRedR_RFD_hi
RootTuber_ArkWhtRedR_RFD_lo
RootTuber_AusCstE_IRR_hi
RootTuber_AusCstE_IRR_lo
RootTuber_AusCstE_RFD_hi
RootTuber_AusCstE_RFD_lo
RootTuber_AusCstN_RFD_hi
RootTuber_AusCstN_RFD_lo
RootTuber_AusCstS_IRR_hi
RootTuber_AusCstS_IRR_lo
RootTuber_AusCstS_RFD_hi
RootTuber_AusCstS_RFD_lo
RootTuber_AusCstW_IRR_hi
RootTuber_AusCstW_IRR_lo
RootTuber_AusCstW_RFD_hi
RootTuber_AusCstW_RFD_lo
RootTuber_AusInt_IRR_hi
RootTuber_AusInt_IRR_lo
RootTuber_AusInt_RFD_hi
RootTuber_AusInt_RFD_lo
RootTuber_BalticSea_IRR_hi
RootTuber_BalticSea_IRR_lo
RootTuber_BalticSea_RFD_hi
RootTuber_BalticSea_RFD_lo
RootTuber_BarentsSea_IRR_hi
RootTuber_BarentsSea_IRR_lo
RootTuber_BarentsSea_RFD_hi
RootTuber_BarentsSea_RFD_lo
RootTuber_BengalBay_IRR_hi
RootTuber_BengalBay_IRR_lo

RootTuber_BengalBay_RFD_hi
RootTuber_BengalBay_RFD_lo
RootTuber_BengalW_IRR_hi
RootTuber_BengalW_IRR_lo
RootTuber_BengalW_RFD_hi
RootTuber_BengalW_RFD_lo
RootTuber_BlackSeaN_IRR_hi
RootTuber_BlackSeaN_IRR_lo
RootTuber_BlackSeaN_RFD_hi
RootTuber_BlackSeaN_RFD_lo
RootTuber_BlackSeaS_IRR_hi
RootTuber_BlackSeaS_IRR_lo
RootTuber_BlackSeaS_RFD_hi
RootTuber_BlackSeaS_RFD_lo
RootTuber_BoHai_IRR_hi
RootTuber_BoHai_IRR_lo
RootTuber_BoHai_RFD_hi
RootTuber_BoHai_RFD_lo
RootTuber_BorneoCstN_IRR_hi
RootTuber_BorneoCstN_IRR_lo
RootTuber_BorneoCstN_RFD_hi
RootTuber_BorneoCstN_RFD_lo
RootTuber_BrahmaniR_IRR_hi
RootTuber_BrahmaniR_IRR_lo
RootTuber_BrahmaniR_RFD_hi
RootTuber_BrahmaniR_RFD_lo
RootTuber_BrzCstE_IRR_hi
RootTuber_BrzCstE_IRR_lo
RootTuber_BrzCstE_RFD_hi
RootTuber_BrzCstE_RFD_lo
RootTuber_BrzCstN_IRR_hi
RootTuber_BrzCstN_IRR_lo
RootTuber_BrzCstN_RFD_hi
RootTuber_BrzCstN_RFD_lo
RootTuber_BrzCstS_IRR_hi
RootTuber_BrzCstS_IRR_lo
RootTuber_BrzCstS_RFD_hi
RootTuber_BrzCstS_RFD_lo
RootTuber_California_IRR_hi
RootTuber_California_IRR_lo
RootTuber_California_RFD_hi
RootTuber_California_RFD_lo
RootTuber_CanAtl_RFD_hi
RootTuber_CanAtl_RFD_lo
RootTuber_Caribbean_IRR_hi
RootTuber_Caribbean_IRR_lo
RootTuber_Caribbean_RFD_hi
RootTuber_Caribbean_RFD_lo
RootTuber_CaspianE_IRR_hi
RootTuber_CaspianE_IRR_lo
RootTuber_CaspianE_RFD_hi
RootTuber_CaspianE_RFD_lo
RootTuber_CaspianNE_IRR_hi
RootTuber_CaspianNE_IRR_lo
RootTuber_CaspianNE_RFD_hi
RootTuber_CaspianNE_RFD_lo
RootTuber_CaspianSW_IRR_hi
RootTuber_CaspianSW_IRR_lo
RootTuber_CaspianSW_RFD_hi
RootTuber_CaspianSW_RFD_lo
RootTuber_CauveryR_IRR_hi
RootTuber_CauveryR_IRR_lo
RootTuber_CauveryR_RFD_hi
RootTuber_CauveryR_RFD_lo
RootTuber_ChaoPhrR_IRR_hi
RootTuber_ChaoPhrR_IRR_lo
RootTuber_ChaoPhrR_RFD_hi
RootTuber_ChaoPhrR_RFD_lo
RootTuber_ChileCstN_IRR_hi
RootTuber_ChileCstN_IRR_lo
RootTuber_ChileCstN_RFD_hi
RootTuber_ChileCstN_RFD_lo
RootTuber_ChileCstS_IRR_hi
RootTuber_ChileCstS_IRR_lo
RootTuber_ChileCstS_RFD_hi
RootTuber_ChileCstS_RFD_lo
RootTuber_ChinaCst_IRR_hi
RootTuber_ChinaCst_IRR_lo
RootTuber_ChinaCst_RFD_hi
RootTuber_ChinaCst_RFD_lo
RootTuber_CntAmer_IRR_hi
RootTuber_CntAmer_IRR_lo
RootTuber_CntAmer_RFD_hi
RootTuber_CntAmer_RFD_lo
RootTuber_ColEcuaCst_IRR_hi
RootTuber_ColEcuaCst_IRR_lo
RootTuber_ColEcuaCst_RFD_hi
RootTuber_ColEcuaCst_RFD_lo
RootTuber_CongoR_IRR_hi
RootTuber_CongoR_IRR_lo
RootTuber_CongoR_RFD_hi
RootTuber_CongoR_RFD_lo
RootTuber_DanubeR_IRR_hi
RootTuber_DanubeR_IRR_lo
RootTuber_DanubeR_RFD_hi
RootTuber_DanubeR_RFD_lo

RootTuber_DaugavaR_IRR_hi
RootTuber_DaugavaR_IRR_lo
RootTuber_DaugavaR_RFD_hi
RootTuber_DaugavaR_RFD_lo
RootTuber_DeadSea_IRR_hi
RootTuber_DeadSea_IRR_lo
RootTuber_DeadSea_RFD_hi
RootTuber_DeadSea_RFD_lo
RootTuber_DnieperR_IRR_hi
RootTuber_DnieperR_IRR_lo
RootTuber_DnieperR_RFD_hi
RootTuber_DnieperR_RFD_lo
RootTuber_DniesterR_IRR_hi
RootTuber_DniesterR_IRR_lo
RootTuber_DniesterR_RFD_hi
RootTuber_DniesterR_RFD_lo
RootTuber_DnkGrmCst_IRR_hi
RootTuber_DnkGrmCst_IRR_lo
RootTuber_DnkGrmCst_RFD_hi
RootTuber_DnkGrmCst_RFD_lo
RootTuber_DonR_IRR_hi
RootTuber_DonR_IRR_lo
RootTuber_DonR_RFD_hi
RootTuber_DonR_RFD_lo
RootTuber_DouroR_IRR_hi
RootTuber_DouroR_IRR_lo
RootTuber_DouroR_RFD_hi
RootTuber_DouroR_RFD_lo
RootTuber_DvinaRN_IRR_hi
RootTuber_DvinaRN_IRR_lo
RootTuber_DvinaRN_RFD_hi
RootTuber_DvinaRN_RFD_lo
RootTuber_EbroR_IRR_hi
RootTuber_EbroR_IRR_lo
RootTuber_EbroR_RFD_hi
RootTuber_EbroR_RFD_lo
RootTuber_EJrdnSyr_IRR_hi
RootTuber_EJrdnSyr_IRR_lo
RootTuber_EJrdnSyr_RFD_hi
RootTuber_EJrdnSyr_RFD_lo
RootTuber_ElbeR_IRR_hi
RootTuber_ElbeR_IRR_lo
RootTuber_ElbeR_RFD_hi
RootTuber_ElbeR_RFD_lo
RootTuber_EmsWeserR_IRR_hi
RootTuber_EmsWeserR_IRR_lo
RootTuber_EmsWeserR_RFD_hi
RootTuber_EmsWeserR_RFD_lo
RootTuber_EngWales_IRR_hi
RootTuber_EngWales_IRR_lo
RootTuber_EngWales_RFD_hi
RootTuber_EngWales_RFD_lo
RootTuber_FarahrudR_IRR_hi
RootTuber_FarahrudR_IRR_lo
RootTuber_FarahrudR_RFD_hi
RootTuber_FarahrudR_RFD_lo
RootTuber_Finland_IRR_hi
RootTuber_Finland_IRR_lo
RootTuber_Finland_RFD_hi
RootTuber_Finland_RFD_lo
RootTuber_FlyR_RFD_hi
RootTuber_FlyR_RFD_lo
RootTuber_FranceCstS_IRR_hi
RootTuber_FranceCstS_IRR_lo
RootTuber_FranceCstS_RFD_hi
RootTuber_FranceCstS_RFD_lo
RootTuber_FranceCstW_IRR_hi
RootTuber_FranceCstW_IRR_lo
RootTuber_FranceCstW_RFD_hi
RootTuber_FranceCstW_RFD_lo
RootTuber_FraserR_IRR_hi
RootTuber_FraserR_IRR_lo
RootTuber_FraserR_RFD_hi
RootTuber_FraserR_RFD_lo
RootTuber_GangesR_IRR_hi
RootTuber_GangesR_IRR_lo
RootTuber_GangesR_RFD_hi
RootTuber_GangesR_RFD_lo
RootTuber_Gironde_IRR_hi
RootTuber_Gironde_IRR_lo
RootTuber_Gironde_RFD_hi
RootTuber_Gironde_RFD_lo
RootTuber_Gobi_IRR_hi
RootTuber_Gobi_IRR_lo
RootTuber_Gobi_RFD_hi
RootTuber_Gobi_RFD_lo
RootTuber_GodavariR_IRR_hi
RootTuber_GodavariR_IRR_lo
RootTuber_GodavariR_RFD_hi
RootTuber_GodavariR_RFD_lo
RootTuber_GreatBasin_IRR_hi
RootTuber_GreatBasin_IRR_lo
RootTuber_GreatBasin_RFD_hi
RootTuber_GreatBasin_RFD_lo
RootTuber_GreatLakes_IRR_hi
RootTuber_GreatLakes_IRR_lo

RootTuber_GreatLakes_RFD_hi
RootTuber_GreatLakes_RFD_lo
RootTuber_GrijUsuR_IRR_hi
RootTuber_GrijUsuR_IRR_lo
RootTuber_GrijUsuR_RFD_hi
RootTuber_GrijUsuR_RFD_lo
RootTuber_GuadalqR_IRR_hi
RootTuber_GuadalqR_IRR_lo
RootTuber_GuadalqR_RFD_hi
RootTuber_GuadalqR_RFD_lo
RootTuber_GuadianaR_IRR_hi
RootTuber_GuadianaR_IRR_lo
RootTuber_GuadianaR_RFD_hi
RootTuber_GuadianaR_RFD_lo
RootTuber_GuineaGulf_IRR_hi
RootTuber_GuineaGulf_IRR_lo
RootTuber_GuineaGulf_RFD_hi
RootTuber_GuineaGulf_RFD_lo
RootTuber_Hainan_IRR_hi
RootTuber_Hainan_IRR_lo
RootTuber_Hainan_RFD_hi
RootTuber_Hainan_RFD_lo
RootTuber_HamuMashR_IRR_hi
RootTuber_HamuMashR_IRR_lo
RootTuber_HamuMashR_RFD_hi
RootTuber_HamuMashR_RFD_lo
RootTuber_Helmand_IRR_hi
RootTuber_Helmand_IRR_lo
RootTuber_Helmand_RFD_hi
RootTuber_Helmand_RFD_lo
RootTuber_Hong_IRR_hi
RootTuber_Hong_IRR_lo
RootTuber_Hong_RFD_hi
RootTuber_Hong_RFD_lo
RootTuber_HuangHeR_IRR_hi
RootTuber_HuangHeR_IRR_lo
RootTuber_HuangHeR_RFD_hi
RootTuber_HuangHeR_RFD_lo
RootTuber_HudsonBay_RFD_hi
RootTuber_HudsonBay_RFD_lo
RootTuber_IberiaCst_IRR_hi
RootTuber_IberiaCst_IRR_lo
RootTuber_IberiaCst_RFD_hi
RootTuber_IberiaCst_RFD_lo
RootTuber_Iceland_RFD_hi
RootTuber_Iceland_RFD_lo
RootTuber_IdnE_IRR_hi
RootTuber_IdnE_IRR_lo
RootTuber_IdnE_RFD_hi
RootTuber_IdnE_RFD_lo
RootTuber_IndCstE_IRR_hi
RootTuber_IndCstE_IRR_lo
RootTuber_IndCstE_RFD_hi
RootTuber_IndCstE_RFD_lo
RootTuber_IndCstNE_IRR_hi
RootTuber_IndCstNE_IRR_lo
RootTuber_IndCstNE_RFD_hi
RootTuber_IndCstNE_RFD_lo
RootTuber_IndCstS_IRR_hi
RootTuber_IndCstS_IRR_lo
RootTuber_IndCstS_RFD_hi
RootTuber_IndCstS_RFD_lo
RootTuber_IndCstW_IRR_hi
RootTuber_IndCstW_IRR_lo
RootTuber_IndCstW_RFD_hi
RootTuber_IndCstW_RFD_lo
RootTuber_IndusR_IRR_hi
RootTuber_IndusR_IRR_lo
RootTuber_IndusR_RFD_hi
RootTuber_IndusR_RFD_lo
RootTuber_Iran_IRR_hi
RootTuber_Iran_IRR_lo
RootTuber_Iran_RFD_hi
RootTuber_Iran_RFD_lo
RootTuber_Ireland_IRR_hi
RootTuber_Ireland_IRR_lo
RootTuber_Ireland_RFD_hi
RootTuber_Ireland_RFD_lo
RootTuber_IrianJaya_IRR_hi
RootTuber_IrianJaya_IRR_lo
RootTuber_IrianJaya_RFD_hi
RootTuber_IrianJaya_RFD_lo
RootTuber_IrrawaddyR_IRR_hi
RootTuber_IrrawaddyR_IRR_lo
RootTuber_IrrawaddyR_RFD_hi
RootTuber_IrrawaddyR_RFD_lo
RootTuber_ItalyCstE_IRR_hi
RootTuber_ItalyCstE_IRR_lo
RootTuber_ItalyCstE_RFD_hi
RootTuber_ItalyCstE_RFD_lo
RootTuber_ItalyCstW_IRR_hi
RootTuber_ItalyCstW_IRR_lo
RootTuber_ItalyCstW_RFD_hi
RootTuber_ItalyCstW_RFD_lo
RootTuber_Japan_IRR_hi
RootTuber_Japan_IRR_lo

RootTuber_Japan_RFD_hi
RootTuber_Japan_RFD_lo
RootTuber_JavaTimor_IRR_hi
RootTuber_JavaTimor_IRR_lo
RootTuber_JavaTimor_RFD_hi
RootTuber_JavaTimor_RFD_lo
RootTuber_Kalimantan_IRR_hi
RootTuber_Kalimantan_IRR_lo
RootTuber_Kalimantan_RFD_hi
RootTuber_Kalimantan_RFD_lo
RootTuber_Korea_IRR_hi
RootTuber_Korea_IRR_lo
RootTuber_Korea_RFD_hi
RootTuber_Korea_RFD_lo
RootTuber_KrishnaR_IRR_hi
RootTuber_KrishnaR_IRR_lo
RootTuber_KrishnaR_RFD_hi
RootTuber_KrishnaR_RFD_lo
RootTuber_LaPuna_IRR_hi
RootTuber_LaPuna_IRR_lo
RootTuber_LaPuna_RFD_hi
RootTuber_LaPuna_RFD_lo
RootTuber_LBalkash_IRR_hi
RootTuber_LBalkash_IRR_lo
RootTuber_LBalkash_RFD_hi
RootTuber_LBalkash_RFD_lo
RootTuber_LChad_IRR_hi
RootTuber_LChad_IRR_lo
RootTuber_LChad_RFD_hi
RootTuber_LChad_RFD_lo
RootTuber_LenaR_RFD_hi
RootTuber_LenaR_RFD_lo
RootTuber_LimpopoR_IRR_hi
RootTuber_LimpopoR_IRR_lo
RootTuber_LimpopoR_RFD_hi
RootTuber_LimpopoR_RFD_lo
RootTuber_LoireR_IRR_hi
RootTuber_LoireR_IRR_lo
RootTuber_LoireR_RFD_hi
RootTuber_LoireR_RFD_lo
RootTuber_Mackenzie_RFD_hi
RootTuber_Mackenzie_RFD_lo
RootTuber_Madagascar_IRR_hi
RootTuber_Madagascar_IRR_lo
RootTuber_Madagascar_RFD_hi
RootTuber_Madagascar_RFD_lo
RootTuber_MagdalenaR_IRR_hi
RootTuber_MagdalenaR_IRR_lo
RootTuber_MagdalenaR_RFD_hi
RootTuber_MagdalenaR_RFD_lo
RootTuber_MahanadiR_IRR_hi
RootTuber_MahanadiR_IRR_lo
RootTuber_MahanadiR_RFD_hi
RootTuber_MahanadiR_RFD_lo
RootTuber_MahiR_IRR_hi
RootTuber_MahiR_IRR_lo
RootTuber_MahiR_RFD_hi
RootTuber_MahiR_RFD_lo
RootTuber_MalaysiaP_IRR_hi
RootTuber_MalaysiaP_IRR_lo
RootTuber_MalaysiaP_RFD_hi
RootTuber_MalaysiaP_RFD_lo
RootTuber_MarChiq_IRR_hi
RootTuber_MarChiq_IRR_lo
RootTuber_MarChiq_RFD_hi
RootTuber_MarChiq_RFD_lo
RootTuber_MeditE_IRR_hi
RootTuber_MeditE_IRR_lo
RootTuber_MeditE_RFD_hi
RootTuber_MeditE_RFD_lo
RootTuber_MeditIsl_IRR_hi
RootTuber_MeditIsl_IRR_lo
RootTuber_MeditIsl_RFD_hi
RootTuber_MeditIsl_RFD_lo
RootTuber_MeditS_IRR_hi
RootTuber_MeditS_IRR_lo
RootTuber_MeditS_RFD_hi
RootTuber_MeditS_RFD_lo
RootTuber_Mekong_IRR_hi
RootTuber_Mekong_IRR_lo
RootTuber_Mekong_RFD_hi
RootTuber_Mekong_RFD_lo
RootTuber_MexBaja_IRR_hi
RootTuber_MexBaja_IRR_lo
RootTuber_MexBaja_RFD_hi
RootTuber_MexBaja_RFD_lo
RootTuber_MexCstNW_IRR_hi
RootTuber_MexCstNW_IRR_lo
RootTuber_MexCstNW_RFD_hi
RootTuber_MexCstNW_RFD_lo
RootTuber_MexCstW_IRR_hi
RootTuber_MexCstW_IRR_lo
RootTuber_MexCstW_RFD_hi
RootTuber_MexCstW_RFD_lo
RootTuber_MexGulf_IRR_hi
RootTuber_MexGulf_IRR_lo

RootTuber_MexGulf_RFD_hi
RootTuber_MexGulf_RFD_lo
RootTuber_MexInt_IRR_hi
RootTuber_MexInt_IRR_lo
RootTuber_MexInt_RFD_hi
RootTuber_MexInt_RFD_lo
RootTuber_MissouriR_IRR_hi
RootTuber_MissouriR_IRR_lo
RootTuber_MissouriR_RFD_hi
RootTuber_MissouriR_RFD_lo
RootTuber_MissppRN_IRR_hi
RootTuber_MissppRN_IRR_lo
RootTuber_MissppRN_RFD_hi
RootTuber_MissppRN_RFD_lo
RootTuber_MissppRS_IRR_hi
RootTuber_MissppRS_IRR_lo
RootTuber_MissppRS_RFD_hi
RootTuber_MissppRS_RFD_lo
RootTuber_MurrayDrlg_IRR_hi
RootTuber_MurrayDrlg_IRR_lo
RootTuber_MurrayDrlg_RFD_hi
RootTuber_MurrayDrlg_RFD_lo
RootTuber_NarmadaR_IRR_hi
RootTuber_NarmadaR_IRR_lo
RootTuber_NarmadaR_RFD_hi
RootTuber_NarmadaR_RFD_lo
RootTuber_NarvaR_IRR_hi
RootTuber_NarvaR_IRR_lo
RootTuber_NarvaR_RFD_hi
RootTuber_NarvaR_RFD_lo
RootTuber_NegroR_IRR_hi
RootTuber_NegroR_IRR_lo
RootTuber_NegroR_RFD_hi
RootTuber_NegroR_RFD_lo
RootTuber_NelsonR_IRR_hi
RootTuber_NelsonR_IRR_lo
RootTuber_NelsonR_RFD_hi
RootTuber_NelsonR_RFD_lo
RootTuber_NemanR_IRR_hi
RootTuber_NemanR_IRR_lo
RootTuber_NemanR_RFD_hi
RootTuber_NemanR_RFD_lo
RootTuber_NevaR_IRR_hi
RootTuber_NevaR_IRR_lo
RootTuber_NevaR_RFD_hi
RootTuber_NevaR_RFD_lo
RootTuber_NewCaledn_RFD_hi
RootTuber_NewCaledn_RFD_lo
RootTuber_NewZealand_IRR_hi
RootTuber_NewZealand_IRR_lo
RootTuber_NewZealand_RFD_hi
RootTuber_NewZealand_RFD_lo
RootTuber_NigerR_IRR_hi
RootTuber_NigerR_IRR_lo
RootTuber_NigerR_RFD_hi
RootTuber_NigerR_RFD_lo
RootTuber_NileR_IRR_hi
RootTuber_NileR_IRR_lo
RootTuber_NileR_RFD_hi
RootTuber_NileR_RFD_lo
RootTuber_NWTerr_RFD_hi
RootTuber_NWTerr_RFD_lo
RootTuber_ObR_IRR_hi
RootTuber_ObR_IRR_lo
RootTuber_ObR_RFD_hi
RootTuber_ObR_RFD_lo
RootTuber_OderR_IRR_hi
RootTuber_OderR_IRR_lo
RootTuber_OderR_RFD_hi
RootTuber_OderR_RFD_lo
RootTuber_OhioR_IRR_hi
RootTuber_OhioR_IRR_lo
RootTuber_OhioR_RFD_hi
RootTuber_OhioR_RFD_lo
RootTuber_OrangeR_IRR_hi
RootTuber_OrangeR_IRR_lo
RootTuber_OrangeR_RFD_hi
RootTuber_OrangeR_RFD_lo
RootTuber_OrinocoR_IRR_hi
RootTuber_OrinocoR_IRR_lo
RootTuber_OrinocoR_RFD_hi
RootTuber_OrinocoR_RFD_lo
RootTuber_PacArctic_RFD_hi
RootTuber_PacArctic_RFD_lo
RootTuber_Pampas_IRR_hi
RootTuber_Pampas_IRR_lo
RootTuber_Pampas_RFD_hi
RootTuber_Pampas_RFD_lo
RootTuber_Papaloapan_IRR_hi
RootTuber_Papaloapan_IRR_lo
RootTuber_Papaloapan_RFD_hi
RootTuber_Papaloapan_RFD_lo
RootTuber_PapuaCst_RFD_hi
RootTuber_PapuaCst_RFD_lo
RootTuber_ParnaibaR_IRR_hi
RootTuber_ParnaibaR_IRR_lo

RootTuber_ParnaibaR_RFD_hi
RootTuber_ParnaibaR_RFD_lo
RootTuber_PennarR_IRR_hi
RootTuber_PennarR_IRR_lo
RootTuber_PennarR_RFD_hi
RootTuber_PennarR_RFD_lo
RootTuber_PersianGulf_IRR_hi
RootTuber_PersianGulf_IRR_lo
RootTuber_PersianGulf_RFD_hi
RootTuber_PersianGulf_RFD_lo
RootTuber_PeruCst_IRR_hi
RootTuber_PeruCst_IRR_lo
RootTuber_PeruCst_RFD_hi
RootTuber_PeruCst_RFD_lo
RootTuber_Phlppns_IRR_hi
RootTuber_Phlppns_IRR_lo
RootTuber_Phlppns_RFD_hi
RootTuber_Phlppns_RFD_lo
RootTuber_PolandCst_IRR_hi
RootTuber_PolandCst_IRR_lo
RootTuber_PolandCst_RFD_hi
RootTuber_PolandCst_RFD_lo
RootTuber_PoR_IRR_hi
RootTuber_PoR_IRR_lo
RootTuber_PoR_RFD_hi
RootTuber_PoR_RFD_lo
RootTuber_RedSeaE_IRR_hi
RootTuber_RedSeaE_IRR_lo
RootTuber_RedSeaE_RFD_hi
RootTuber_RedSeaE_RFD_lo
RootTuber_RhineR_IRR_hi
RootTuber_RhineR_IRR_lo
RootTuber_RhineR_RFD_hi
RootTuber_RhineR_RFD_lo
RootTuber_RhoneR_IRR_hi
RootTuber_RhoneR_IRR_lo
RootTuber_RhoneR_RFD_hi
RootTuber_RhoneR_RFD_lo
RootTuber_RiftValley_IRR_hi
RootTuber_RiftValley_IRR_lo
RootTuber_RiftValley_RFD_hi
RootTuber_RiftValley_RFD_lo
RootTuber_RioBalsas_IRR_hi
RootTuber_RioBalsas_IRR_lo
RootTuber_RioBalsas_RFD_hi
RootTuber_RioBalsas_RFD_lo
RootTuber_RioGrande_IRR_hi
RootTuber_RioGrande_IRR_lo
RootTuber_RioGrande_RFD_hi
RootTuber_RioGrande_RFD_lo
RootTuber_RioLaPlata_IRR_hi
RootTuber_RioLaPlata_IRR_lo
RootTuber_RioLaPlata_RFD_hi
RootTuber_RioLaPlata_RFD_lo
RootTuber_RioLerma_IRR_hi
RootTuber_RioLerma_IRR_lo
RootTuber_RioLerma_RFD_hi
RootTuber_RioLerma_RFD_lo
RootTuber_RioVerde_IRR_hi
RootTuber_RioVerde_IRR_lo
RootTuber_RioVerde_RFD_hi
RootTuber_RioVerde_RFD_lo
RootTuber_RusCstSE_IRR_hi
RootTuber_RusCstSE_IRR_lo
RootTuber_RusCstSE_RFD_hi
RootTuber_RusCstSE_RFD_lo
RootTuber_SabarmatiR_IRR_hi
RootTuber_SabarmatiR_IRR_lo
RootTuber_SabarmatiR_RFD_hi
RootTuber_SabarmatiR_RFD_lo
RootTuber_Salinas_IRR_hi
RootTuber_Salinas_IRR_lo
RootTuber_Salinas_RFD_hi
RootTuber_Salinas_RFD_lo
RootTuber_Salween_IRR_hi
RootTuber_Salween_IRR_lo
RootTuber_Salween_RFD_hi
RootTuber_Salween_RFD_lo
RootTuber_SAmerCstN_IRR_hi
RootTuber_SAmerCstN_IRR_lo
RootTuber_SAmerCstN_RFD_hi
RootTuber_SAmerCstN_RFD_lo
RootTuber_SAmerCstNE_IRR_hi
RootTuber_SAmerCstNE_IRR_lo
RootTuber_SAmerCstNE_RFD_hi
RootTuber_SAmerCstNE_RFD_lo
RootTuber_SaoFrancR_IRR_hi
RootTuber_SaoFrancR_IRR_lo
RootTuber_SaoFrancR_RFD_hi
RootTuber_SaoFrancR_RFD_lo
RootTuber_ScheldtR_IRR_hi
RootTuber_ScheldtR_IRR_lo
RootTuber_ScheldtR_RFD_hi
RootTuber_ScheldtR_RFD_lo
RootTuber_SChinaSea_IRR_hi
RootTuber_SChinaSea_IRR_lo

RootTuber_SChinaSea_RFD_hi
RootTuber_SChinaSea_RFD_lo
RootTuber_ScndnvN_IRR_hi
RootTuber_ScndnvN_IRR_lo
RootTuber_ScndnvN_RFD_hi
RootTuber_ScndnvN_RFD_lo
RootTuber_Scotland_IRR_hi
RootTuber_Scotland_IRR_lo
RootTuber_Scotland_RFD_hi
RootTuber_Scotland_RFD_lo
RootTuber_SeineR_IRR_hi
RootTuber_SeineR_IRR_lo
RootTuber_SeineR_RFD_hi
RootTuber_SeineR_RFD_lo
RootTuber_SenegalR_IRR_hi
RootTuber_SenegalR_IRR_lo
RootTuber_SenegalR_RFD_hi
RootTuber_SenegalR_RFD_lo
RootTuber_SepikR_RFD_hi
RootTuber_SepikR_RFD_lo
RootTuber_ShebJubR_IRR_hi
RootTuber_ShebJubR_IRR_lo
RootTuber_ShebJubR_RFD_hi
RootTuber_ShebJubR_RFD_lo
RootTuber_SiberiaW_RFD_hi
RootTuber_SiberiaW_RFD_lo
RootTuber_SinaiP_IRR_hi
RootTuber_SinaiP_IRR_lo
RootTuber_SinaiP_RFD_hi
RootTuber_SinaiP_RFD_lo
RootTuber_SittaungR_IRR_hi
RootTuber_SittaungR_IRR_lo
RootTuber_SittaungR_RFD_hi
RootTuber_SittaungR_RFD_lo
RootTuber_SolomonIsl_RFD_hi
RootTuber_SolomonIsl_RFD_lo
RootTuber_SpainCstSE_IRR_hi
RootTuber_SpainCstSE_IRR_lo
RootTuber_SpainCstSE_RFD_hi
RootTuber_SpainCstSE_RFD_lo
RootTuber_SriLanka_IRR_hi
RootTuber_SriLanka_IRR_lo
RootTuber_SriLanka_RFD_hi
RootTuber_SriLanka_RFD_lo
RootTuber_StLwrncR_RFD_hi
RootTuber_StLwrncR_RFD_lo
RootTuber_Sulawesi_IRR_hi
RootTuber_Sulawesi_IRR_lo
RootTuber_Sulawesi_RFD_hi
RootTuber_Sulawesi_RFD_lo
RootTuber_Sumatra_IRR_hi
RootTuber_Sumatra_IRR_lo
RootTuber_Sumatra_RFD_hi
RootTuber_Sumatra_RFD_lo
RootTuber_Sweden_IRR_hi
RootTuber_Sweden_IRR_lo
RootTuber_Sweden_RFD_hi
RootTuber_Sweden_RFD_lo
RootTuber_SyrDaryaR_IRR_hi
RootTuber_SyrDaryaR_IRR_lo
RootTuber_SyrDaryaR_RFD_hi
RootTuber_SyrDaryaR_RFD_lo
RootTuber_TagusR_IRR_hi
RootTuber_TagusR_IRR_lo
RootTuber_TagusR_RFD_hi
RootTuber_TagusR_RFD_lo
RootTuber_Taiwan_IRR_hi
RootTuber_Taiwan_IRR_lo
RootTuber_Taiwan_RFD_hi
RootTuber_Taiwan_RFD_lo
RootTuber_TaptiR_IRR_hi
RootTuber_TaptiR_IRR_lo
RootTuber_TaptiR_RFD_hi
RootTuber_TaptiR_RFD_lo
RootTuber_Tarim_IRR_hi
RootTuber_Tarim_IRR_lo
RootTuber_Tarim_RFD_hi
RootTuber_Tarim_RFD_lo
RootTuber_Tasmania_IRR_hi
RootTuber_Tasmania_IRR_lo
RootTuber_Tasmania_RFD_hi
RootTuber_Tasmania_RFD_lo
RootTuber_Tehuantpc_IRR_hi
RootTuber_Tehuantpc_IRR_lo
RootTuber_Tehuantpc_RFD_hi
RootTuber_Tehuantpc_RFD_lo
RootTuber_TennR_IRR_hi
RootTuber_TennR_IRR_lo
RootTuber_TennR_RFD_hi
RootTuber_TennR_RFD_lo
RootTuber_TexasCst_IRR_hi
RootTuber_TexasCst_IRR_lo
RootTuber_TexasCst_RFD_hi
RootTuber_TexasCst_RFD_lo
RootTuber_ThaiGulf_IRR_hi
RootTuber_ThaiGulf_IRR_lo

RootTuber_ThaiGulf_RFD_hi
RootTuber_ThaiGulf_RFD_lo
RootTuber_TiberR_IRR_hi
RootTuber_TiberR_IRR_lo
RootTuber_TiberR_RFD_hi
RootTuber_TiberR_RFD_lo
RootTuber_TigrEuphR_IRR_hi
RootTuber_TigrEuphR_IRR_lo
RootTuber_TigrEuphR_RFD_hi
RootTuber_TigrEuphR_RFD_lo
RootTuber_TocantinsR_IRR_hi
RootTuber_TocantinsR_IRR_lo
RootTuber_TocantinsR_RFD_hi
RootTuber_TocantinsR_RFD_lo
RootTuber_UralR_IRR_hi
RootTuber_UralR_IRR_lo
RootTuber_UralR_RFD_hi
RootTuber_UralR_RFD_lo
RootTuber_UsaColoRN_IRR_hi
RootTuber_UsaColoRN_IRR_lo
RootTuber_UsaColoRN_RFD_hi
RootTuber_UsaColoRN_RFD_lo
RootTuber_UsaColoRS_IRR_hi
RootTuber_UsaColoRS_IRR_lo
RootTuber_UsaColoRS_RFD_hi
RootTuber_UsaColoRS_RFD_lo
RootTuber_UsaCstE_IRR_hi
RootTuber_UsaCstE_IRR_lo
RootTuber_UsaCstE_RFD_hi
RootTuber_UsaCstE_RFD_lo
RootTuber_UsaCstNE_IRR_hi
RootTuber_UsaCstNE_IRR_lo
RootTuber_UsaCstNE_RFD_hi
RootTuber_UsaCstNE_RFD_lo
RootTuber_UsaCstSE_IRR_hi
RootTuber_UsaCstSE_IRR_lo
RootTuber_UsaCstSE_RFD_hi
RootTuber_UsaCstSE_RFD_lo
RootTuber_UsaPacNW_IRR_hi
RootTuber_UsaPacNW_IRR_lo
RootTuber_UsaPacNW_RFD_hi
RootTuber_UsaPacNW_RFD_lo
RootTuber_VietnamCst_IRR_hi
RootTuber_VietnamCst_IRR_lo
RootTuber_VietnamCst_RFD_hi
RootTuber_VietnamCst_RFD_lo
RootTuber_VolgaR_IRR_hi
RootTuber_VolgaR_IRR_lo
RootTuber_VolgaR_RFD_hi
RootTuber_VolgaR_RFD_lo
RootTuber_VoltaR_IRR_hi
RootTuber_VoltaR_IRR_lo
RootTuber_VoltaR_RFD_hi
RootTuber_VoltaR_RFD_lo
RootTuber_WislaR_IRR_hi
RootTuber_WislaR_IRR_lo
RootTuber_WislaR_RFD_hi
RootTuber_WislaR_RFD_lo
RootTuber_XunJiang_IRR_hi
RootTuber_XunJiang_IRR_lo
RootTuber_XunJiang_RFD_hi
RootTuber_XunJiang_RFD_lo
RootTuber_Yangtze_IRR_hi
RootTuber_Yangtze_IRR_lo
RootTuber_Yangtze_RFD_hi
RootTuber_Yangtze_RFD_lo
RootTuber_YeniseiR_IRR_hi
RootTuber_YeniseiR_IRR_lo
RootTuber_YeniseiR_RFD_hi
RootTuber_YeniseiR_RFD_lo
RootTuber_YucatanP_IRR_hi
RootTuber_YucatanP_IRR_lo
RootTuber_YucatanP_RFD_hi
RootTuber_YucatanP_RFD_lo
RootTuber_ZambeziR_IRR_hi
RootTuber_ZambeziR_IRR_lo
RootTuber_ZambeziR_RFD_hi
RootTuber_ZambeziR_RFD_lo
RootTuber_ZiyaHe_IRR_hi
RootTuber_ZiyaHe_IRR_lo
RootTuber_ZiyaHe_RFD_hi
RootTuber_ZiyaHe_RFD_lo
Scavenging_Other
semiconductors
solvents
Soybean_AdrBlkSea_IRR_hi
Soybean_AdrBlkSea_IRR_lo
Soybean_AdrBlkSea_RFD_hi
Soybean_AdrBlkSea_RFD_lo
Soybean_AfrCstE_RFD_hi
Soybean_AfrCstE_RFD_lo
Soybean_AfrCstNE_IRR_hi
Soybean_AfrCstNE_IRR_lo
Soybean_AfrCstNE_RFD_hi
Soybean_AfrCstNE_RFD_lo
Soybean_AfrCstNW_RFD_hi

Soybean_AfrCstNW_RFD_lo
Soybean_AfrCstS_IRR_hi
Soybean_AfrCstS_IRR_lo
Soybean_AfrCstS_RFD_hi
Soybean_AfrCstS_RFD_lo
Soybean_AfrCstSE_IRR_hi
Soybean_AfrCstSE_IRR_lo
Soybean_AfrCstSE_RFD_hi
Soybean_AfrCstSE_RFD_lo
Soybean_AfrCstSSW_IRR_hi
Soybean_AfrCstSSW_IRR_lo
Soybean_AfrCstSSW_RFD_hi
Soybean_AfrCstSSW_RFD_lo
Soybean_AfrCstW_RFD_hi
Soybean_AfrCstW_RFD_lo
Soybean_AfrIntN_IRR_hi
Soybean_AfrIntN_IRR_lo
Soybean_AfrIntN_RFD_hi
Soybean_AfrIntN_RFD_lo
Soybean_AfrIntS_RFD_hi
Soybean_AfrIntS_RFD_lo
Soybean_AmazonR_IRR_hi
Soybean_AmazonR_IRR_lo
Soybean_AmazonR_RFD_hi
Soybean_AmazonR_RFD_lo
Soybean_AmuDaryaR_IRR_hi
Soybean_AmuDaryaR_IRR_lo
Soybean_AmuDaryaR_RFD_hi
Soybean_AmuDaryaR_RFD_lo
Soybean_AmurR_IRR_hi
Soybean_AmurR_IRR_lo
Soybean_AmurR_RFD_hi
Soybean_AmurR_RFD_lo
Soybean_AngolaCst_RFD_hi
Soybean_AngolaCst_RFD_lo
Soybean_ArabianSea_RFD_hi
Soybean_ArabianSea_RFD_lo
Soybean_ArgColoR_IRR_hi
Soybean_ArgColoR_IRR_lo
Soybean_ArgColoR_RFD_hi
Soybean_ArgColoR_RFD_lo
Soybean_ArgCstN_IRR_hi
Soybean_ArgCstN_IRR_lo
Soybean_ArgCstN_RFD_hi
Soybean_ArgCstN_RFD_lo
Soybean_ArgCstS_RFD_hi
Soybean_ArgCstS_RFD_lo
Soybean_ArkWhtRedR_IRR_hi
Soybean_ArkWhtRedR_IRR_lo
Soybean_ArkWhtRedR_RFD_hi
Soybean_ArkWhtRedR_RFD_lo
Soybean_AusCstE_RFD_hi
Soybean_AusCstE_RFD_lo
Soybean_BalticSea_RFD_hi
Soybean_BalticSea_RFD_lo
Soybean_BarentsSea_RFD_hi
Soybean_BarentsSea_RFD_lo
Soybean_BengalBay_RFD_hi
Soybean_BengalBay_RFD_lo
Soybean_BengalW_RFD_hi
Soybean_BengalW_RFD_lo
Soybean_BlackSeaN_RFD_hi
Soybean_BlackSeaN_RFD_lo
Soybean_BlackSeaS_RFD_hi
Soybean_BlackSeaS_RFD_lo
Soybean_BoHai_IRR_hi
Soybean_BoHai_IRR_lo
Soybean_BoHai_RFD_hi
Soybean_BoHai_RFD_lo
Soybean_BorneoCstN_RFD_hi
Soybean_BorneoCstN_RFD_lo
Soybean_BrahmaniR_RFD_hi
Soybean_BrahmaniR_RFD_lo
Soybean_BrzCstE_RFD_hi
Soybean_BrzCstE_RFD_lo
Soybean_BrzCstN_IRR_hi
Soybean_BrzCstN_IRR_lo
Soybean_BrzCstN_RFD_hi
Soybean_BrzCstN_RFD_lo
Soybean_BrzCstS_IRR_hi
Soybean_BrzCstS_IRR_lo
Soybean_BrzCstS_RFD_hi
Soybean_BrzCstS_RFD_lo
Soybean_CanAtl_RFD_hi
Soybean_CanAtl_RFD_lo
Soybean_CaspianE_IRR_hi
Soybean_CaspianE_IRR_lo
Soybean_CaspianE_RFD_hi
Soybean_CaspianE_RFD_lo
Soybean_CaspianNE_RFD_hi
Soybean_CaspianNE_RFD_lo
Soybean_CaspianSW_IRR_hi
Soybean_CaspianSW_IRR_lo
Soybean_CaspianSW_RFD_hi
Soybean_CaspianSW_RFD_lo
Soybean_CauveryR_IRR_hi

Soybean_CauveryR_IRR_lo
Soybean_CauveryR_RFD_hi
Soybean_CauveryR_RFD_lo
Soybean_ChaoPhrR_RFD_hi
Soybean_ChaoPhrR_RFD_lo
Soybean_ChinaCst_IRR_hi
Soybean_ChinaCst_IRR_lo
Soybean_ChinaCst_RFD_hi
Soybean_ChinaCst_RFD_lo
Soybean_CntAmer_IRR_hi
Soybean_CntAmer_IRR_lo
Soybean_CntAmer_RFD_hi
Soybean_CntAmer_RFD_lo
Soybean_ColEcuaCst_RFD_hi
Soybean_ColEcuaCst_RFD_lo
Soybean_CongoR_RFD_hi
Soybean_CongoR_RFD_lo
Soybean_DanubeR_IRR_hi
Soybean_DanubeR_IRR_lo
Soybean_DanubeR_RFD_hi
Soybean_DanubeR_RFD_lo
Soybean_DaugavaR_RFD_hi
Soybean_DaugavaR_RFD_lo
Soybean_DeadSea_RFD_hi
Soybean_DeadSea_RFD_lo
Soybean_DnieperR_RFD_hi
Soybean_DnieperR_RFD_lo
Soybean_DniesterR_RFD_hi
Soybean_DniesterR_RFD_lo
Soybean_DnkGrmCst_RFD_hi
Soybean_DnkGrmCst_RFD_lo
Soybean_DonR_RFD_hi
Soybean_DonR_RFD_lo
Soybean_DvinaRN_RFD_hi
Soybean_DvinaRN_RFD_lo
Soybean_EbroR_IRR_hi
Soybean_EbroR_IRR_lo
Soybean_EbroR_RFD_hi
Soybean_EbroR_RFD_lo
Soybean_EJrdnSyr_RFD_hi
Soybean_EJrdnSyr_RFD_lo
Soybean_ElbeR_RFD_hi
Soybean_ElbeR_RFD_lo
Soybean_EmsWeserR_RFD_hi
Soybean_EmsWeserR_RFD_lo
Soybean_FarahrudR_IRR_hi
Soybean_FarahrudR_IRR_lo
Soybean_FarahrudR_RFD_hi
Soybean_FarahrudR_RFD_lo
Soybean_Finland_RFD_hi
Soybean_Finland_RFD_lo
Soybean_FranceCstS_IRR_hi
Soybean_FranceCstS_IRR_lo
Soybean_FranceCstS_RFD_hi
Soybean_FranceCstS_RFD_lo
Soybean_FranceCstW_IRR_hi
Soybean_FranceCstW_IRR_lo
Soybean_FranceCstW_RFD_hi
Soybean_FranceCstW_RFD_lo
Soybean_GangesR_IRR_hi
Soybean_GangesR_IRR_lo
Soybean_GangesR_RFD_hi
Soybean_GangesR_RFD_lo
Soybean_Gironde_IRR_hi
Soybean_Gironde_IRR_lo
Soybean_Gironde_RFD_hi
Soybean_Gironde_RFD_lo
Soybean_Gobi_IRR_hi
Soybean_Gobi_IRR_lo
Soybean_Gobi_RFD_hi
Soybean_Gobi_RFD_lo
Soybean_GodavariR_IRR_hi
Soybean_GodavariR_IRR_lo
Soybean_GodavariR_RFD_hi
Soybean_GodavariR_RFD_lo
Soybean_GreatLakes_IRR_hi
Soybean_GreatLakes_IRR_lo
Soybean_GreatLakes_RFD_hi
Soybean_GreatLakes_RFD_lo
Soybean_GrijUsuR_IRR_hi
Soybean_GrijUsuR_IRR_lo
Soybean_GrijUsuR_RFD_hi
Soybean_GrijUsuR_RFD_lo
Soybean_GuadalqR_IRR_hi
Soybean_GuadalqR_IRR_lo
Soybean_GuadianaR_IRR_hi
Soybean_GuadianaR_IRR_lo
Soybean_GuineaGulf_RFD_hi
Soybean_GuineaGulf_RFD_lo
Soybean_Hainan_IRR_hi
Soybean_Hainan_IRR_lo
Soybean_Hainan_RFD_hi
Soybean_Hainan_RFD_lo
Soybean_HamuMashR_IRR_hi
Soybean_HamuMashR_IRR_lo
Soybean_HamuMashR_RFD_hi

Soybean_HamuMashR_RFD_lo
Soybean_Helmand_IRR_hi
Soybean_Helmand_IRR_lo
Soybean_Helmand_RFD_hi
Soybean_Helmand_RFD_lo
Soybean_Hong_IRR_hi
Soybean_Hong_IRR_lo
Soybean_Hong_RFD_hi
Soybean_Hong_RFD_lo
Soybean_HuangHeR_IRR_hi
Soybean_HuangHeR_IRR_lo
Soybean_HuangHeR_RFD_hi
Soybean_HuangHeR_RFD_lo
Soybean_HudsonBay_RFD_hi
Soybean_HudsonBay_RFD_lo
Soybean_IberiaCst_IRR_hi
Soybean_IberiaCst_IRR_lo
Soybean_IberiaCst_RFD_hi
Soybean_IberiaCst_RFD_lo
Soybean_IdnE_IRR_hi
Soybean_IdnE_IRR_lo
Soybean_IdnE_RFD_hi
Soybean_IdnE_RFD_lo
Soybean_IndCstE_IRR_hi
Soybean_IndCstE_IRR_lo
Soybean_IndCstE_RFD_hi
Soybean_IndCstE_RFD_lo
Soybean_IndCstNE_RFD_hi
Soybean_IndCstNE_RFD_lo
Soybean_IndCstS_IRR_hi
Soybean_IndCstS_IRR_lo
Soybean_IndCstS_RFD_hi
Soybean_IndCstS_RFD_lo
Soybean_IndCstW_IRR_hi
Soybean_IndCstW_IRR_lo
Soybean_IndCstW_RFD_hi
Soybean_IndCstW_RFD_lo
Soybean_IndusR_IRR_hi
Soybean_IndusR_IRR_lo
Soybean_IndusR_RFD_hi
Soybean_IndusR_RFD_lo
Soybean_Iran_IRR_hi
Soybean_Iran_IRR_lo
Soybean_Iran_RFD_hi
Soybean_Iran_RFD_lo
Soybean_IrianJaya_IRR_hi
Soybean_IrianJaya_IRR_lo
Soybean_IrianJaya_RFD_hi
Soybean_IrianJaya_RFD_lo
Soybean_IrrawaddyR_IRR_hi
Soybean_IrrawaddyR_IRR_lo
Soybean_IrrawaddyR_RFD_hi
Soybean_IrrawaddyR_RFD_lo
Soybean_ItalyCstE_IRR_hi
Soybean_ItalyCstE_IRR_lo
Soybean_ItalyCstE_RFD_hi
Soybean_ItalyCstE_RFD_lo
Soybean_ItalyCstW_IRR_hi
Soybean_ItalyCstW_IRR_lo
Soybean_ItalyCstW_RFD_hi
Soybean_ItalyCstW_RFD_lo
Soybean_Japan_RFD_hi
Soybean_Japan_RFD_lo
Soybean_JavaTimor_IRR_hi
Soybean_JavaTimor_IRR_lo
Soybean_JavaTimor_RFD_hi
Soybean_JavaTimor_RFD_lo
Soybean_Kalimantan_IRR_hi
Soybean_Kalimantan_IRR_lo
Soybean_Kalimantan_RFD_hi
Soybean_Kalimantan_RFD_lo
Soybean_Korea_IRR_hi
Soybean_Korea_IRR_lo
Soybean_Korea_RFD_hi
Soybean_Korea_RFD_lo
Soybean_KrishnaR_IRR_hi
Soybean_KrishnaR_IRR_lo
Soybean_KrishnaR_RFD_hi
Soybean_KrishnaR_RFD_lo
Soybean_LaPuna_RFD_hi
Soybean_LaPuna_RFD_lo
Soybean_LBalkash_IRR_hi
Soybean_LBalkash_IRR_lo
Soybean_LBalkash_RFD_hi
Soybean_LBalkash_RFD_lo
Soybean_LChad_RFD_hi
Soybean_LChad_RFD_lo
Soybean_LenaR_RFD_hi
Soybean_LenaR_RFD_lo
Soybean_LimpopoR_IRR_hi
Soybean_LimpopoR_IRR_lo
Soybean_LimpopoR_RFD_hi
Soybean_LimpopoR_RFD_lo
Soybean_LoireR_IRR_hi
Soybean_LoireR_IRR_lo
Soybean_LoireR_RFD_hi

Soybean_LoireR_RFD_lo
Soybean_Mackenzie_RFD_hi
Soybean_Mackenzie_RFD_lo
Soybean_Madagascar_RFD_hi
Soybean_Madagascar_RFD_lo
Soybean_MagdalenaR_RFD_hi
Soybean_MagdalenaR_RFD_lo
Soybean_MahanadiR_IRR_hi
Soybean_MahanadiR_IRR_lo
Soybean_MahanadiR_RFD_hi
Soybean_MahanadiR_RFD_lo
Soybean_MahiR_IRR_hi
Soybean_MahiR_IRR_lo
Soybean_MahiR_RFD_hi
Soybean_MahiR_RFD_lo
Soybean_MalaysiaP_RFD_hi
Soybean_MalaysiaP_RFD_lo
Soybean_MarChiq_IRR_hi
Soybean_MarChiq_IRR_lo
Soybean_MarChiq_RFD_hi
Soybean_MarChiq_RFD_lo
Soybean_MeditE_IRR_hi
Soybean_MeditE_IRR_lo
Soybean_MeditE_RFD_hi
Soybean_MeditE_RFD_lo
Soybean_MeditS_RFD_hi
Soybean_MeditS_RFD_lo
Soybean_Mekong_IRR_hi
Soybean_Mekong_IRR_lo
Soybean_Mekong_RFD_hi
Soybean_Mekong_RFD_lo
Soybean_MexCstNW_IRR_hi
Soybean_MexCstNW_IRR_lo
Soybean_MexCstW_IRR_hi
Soybean_MexCstW_IRR_lo
Soybean_MexGulf_IRR_hi
Soybean_MexGulf_IRR_lo
Soybean_MexInt_IRR_hi
Soybean_MexInt_IRR_lo
Soybean_MissouriR_IRR_hi
Soybean_MissouriR_IRR_lo
Soybean_MissouriR_RFD_hi
Soybean_MissouriR_RFD_lo
Soybean_MissppRN_IRR_hi
Soybean_MissppRN_IRR_lo
Soybean_MissppRN_RFD_hi
Soybean_MissppRN_RFD_lo
Soybean_MissppRS_IRR_hi
Soybean_MissppRS_IRR_lo
Soybean_MissppRS_RFD_hi
Soybean_MissppRS_RFD_lo
Soybean_MurrayDrlg_RFD_hi
Soybean_MurrayDrlg_RFD_lo
Soybean_NarmadaR_IRR_hi
Soybean_NarmadaR_IRR_lo
Soybean_NarmadaR_RFD_hi
Soybean_NarmadaR_RFD_lo
Soybean_NarvaR_RFD_hi
Soybean_NarvaR_RFD_lo
Soybean_NegroR_RFD_hi
Soybean_NegroR_RFD_lo
Soybean_NelsonR_IRR_hi
Soybean_NelsonR_IRR_lo
Soybean_NelsonR_RFD_hi
Soybean_NelsonR_RFD_lo
Soybean_NemanR_RFD_hi
Soybean_NemanR_RFD_lo
Soybean_NevaR_RFD_hi
Soybean_NevaR_RFD_lo
Soybean_NigerR_RFD_hi
Soybean_NigerR_RFD_lo
Soybean_NileR_IRR_hi
Soybean_NileR_IRR_lo
Soybean_NileR_RFD_hi
Soybean_NileR_RFD_lo
Soybean_ObR_IRR_hi
Soybean_ObR_IRR_lo
Soybean_ObR_RFD_hi
Soybean_ObR_RFD_lo
Soybean_OderR_RFD_hi
Soybean_OderR_RFD_lo
Soybean_OhioR_IRR_hi
Soybean_OhioR_IRR_lo
Soybean_OhioR_RFD_hi
Soybean_OhioR_RFD_lo
Soybean_OrangeR_IRR_hi
Soybean_OrangeR_IRR_lo
Soybean_OrangeR_RFD_hi
Soybean_OrangeR_RFD_lo
Soybean_OrinocoR_RFD_hi
Soybean_OrinocoR_RFD_lo
Soybean_Pampas_IRR_hi
Soybean_Pampas_IRR_lo
Soybean_Pampas_RFD_hi
Soybean_Pampas_RFD_lo
Soybean_ParnaibaR_IRR_hi

Soybean_ParnaibaR_IRR_lo
Soybean_ParnaibaR_RFD_hi
Soybean_ParnaibaR_RFD_lo
Soybean_PennarR_IRR_hi
Soybean_PennarR_IRR_lo
Soybean_PennarR_RFD_hi
Soybean_PennarR_RFD_lo
Soybean_PersianGulf_IRR_hi
Soybean_PersianGulf_IRR_lo
Soybean_PersianGulf_RFD_hi
Soybean_PersianGulf_RFD_lo
Soybean_PeruCst_RFD_hi
Soybean_PeruCst_RFD_lo
Soybean_Phlppns_RFD_hi
Soybean_Phlppns_RFD_lo
Soybean_PolandCst_RFD_hi
Soybean_PolandCst_RFD_lo
Soybean_PoR_IRR_hi
Soybean_PoR_IRR_lo
Soybean_PoR_RFD_hi
Soybean_PoR_RFD_lo
Soybean_RhineR_IRR_hi
Soybean_RhineR_IRR_lo
Soybean_RhineR_RFD_hi
Soybean_RhineR_RFD_lo
Soybean_RhoneR_IRR_hi
Soybean_RhoneR_IRR_lo
Soybean_RhoneR_RFD_hi
Soybean_RhoneR_RFD_lo
Soybean_RiftValley_IRR_hi
Soybean_RiftValley_IRR_lo
Soybean_RiftValley_RFD_hi
Soybean_RiftValley_RFD_lo
Soybean_RioBalsas_IRR_hi
Soybean_RioBalsas_IRR_lo
Soybean_RioGrande_IRR_hi
Soybean_RioGrande_IRR_lo
Soybean_RioGrande_RFD_hi
Soybean_RioGrande_RFD_lo
Soybean_RioLaPlata_IRR_hi
Soybean_RioLaPlata_IRR_lo
Soybean_RioLaPlata_RFD_hi
Soybean_RioLaPlata_RFD_lo
Soybean_RioLerma_IRR_hi
Soybean_RioLerma_IRR_lo
Soybean_RioVerde_IRR_hi
Soybean_RioVerde_IRR_lo
Soybean_RusCstSE_IRR_hi
Soybean_RusCstSE_IRR_lo
Soybean_RusCstSE_RFD_hi
Soybean_RusCstSE_RFD_lo
Soybean_SabarmatiR_IRR_hi
Soybean_SabarmatiR_IRR_lo
Soybean_SabarmatiR_RFD_hi
Soybean_SabarmatiR_RFD_lo
Soybean_Salinas_IRR_hi
Soybean_Salinas_IRR_lo
Soybean_Salinas_RFD_hi
Soybean_Salinas_RFD_lo
Soybean_Salween_IRR_hi
Soybean_Salween_IRR_lo
Soybean_Salween_RFD_hi
Soybean_Salween_RFD_lo
Soybean_SAmerCstN_RFD_hi
Soybean_SAmerCstN_RFD_lo
Soybean_SAmerCstNE_RFD_hi
Soybean_SAmerCstNE_RFD_lo
Soybean_SaoFrancR_IRR_hi
Soybean_SaoFrancR_IRR_lo
Soybean_SaoFrancR_RFD_hi
Soybean_SaoFrancR_RFD_lo
Soybean_SChinaSea_IRR_hi
Soybean_SChinaSea_IRR_lo
Soybean_SChinaSea_RFD_hi
Soybean_SChinaSea_RFD_lo
Soybean_SeineR_IRR_hi
Soybean_SeineR_IRR_lo
Soybean_SeineR_RFD_hi
Soybean_SeineR_RFD_lo
Soybean_SenegalR_RFD_hi
Soybean_SenegalR_RFD_lo
Soybean_SepikR_RFD_hi
Soybean_SepikR_RFD_lo
Soybean_ShebJubR_IRR_hi
Soybean_ShebJubR_IRR_lo
Soybean_ShebJubR_RFD_hi
Soybean_ShebJubR_RFD_lo
Soybean_SiberiaW_RFD_hi
Soybean_SiberiaW_RFD_lo
Soybean_SinaiP_IRR_hi
Soybean_SinaiP_IRR_lo
Soybean_SinaiP_RFD_hi
Soybean_SinaiP_RFD_lo
Soybean_SittaungR_RFD_hi
Soybean_SittaungR_RFD_lo
Soybean_SpainCstSE_IRR_hi

Soybean_SpainCstSE_IRR_lo
Soybean_SpainCstSE_RFD_hi
Soybean_SpainCstSE_RFD_lo
Soybean_SriLanka_RFD_hi
Soybean_SriLanka_RFD_lo
Soybean_StLwrncR_RFD_hi
Soybean_StLwrncR_RFD_lo
Soybean_Sulawesi_IRR_hi
Soybean_Sulawesi_IRR_lo
Soybean_Sulawesi_RFD_hi
Soybean_Sulawesi_RFD_lo
Soybean_Sumatra_IRR_hi
Soybean_Sumatra_IRR_lo
Soybean_Sumatra_RFD_hi
Soybean_Sumatra_RFD_lo
Soybean_SyrDaryaR_IRR_hi
Soybean_SyrDaryaR_IRR_lo
Soybean_SyrDaryaR_RFD_hi
Soybean_SyrDaryaR_RFD_lo
Soybean_TagusR_IRR_hi
Soybean_TagusR_IRR_lo
Soybean_Taiwan_RFD_hi
Soybean_Taiwan_RFD_lo
Soybean_TaptiR_IRR_hi
Soybean_TaptiR_IRR_lo
Soybean_TaptiR_RFD_hi
Soybean_TaptiR_RFD_lo
Soybean_Tarim_IRR_hi
Soybean_Tarim_IRR_lo
Soybean_Tarim_RFD_hi
Soybean_Tarim_RFD_lo
Soybean_Tehuantpc_IRR_hi
Soybean_Tehuantpc_IRR_lo
Soybean_TennR_IRR_hi
Soybean_TennR_IRR_lo
Soybean_TennR_RFD_hi
Soybean_TennR_RFD_lo
Soybean_TexasCst_IRR_hi
Soybean_TexasCst_IRR_lo
Soybean_TexasCst_RFD_hi
Soybean_TexasCst_RFD_lo
Soybean_ThaiGulf_RFD_hi
Soybean_ThaiGulf_RFD_lo
Soybean_TiberR_IRR_hi
Soybean_TiberR_IRR_lo
Soybean_TiberR_RFD_hi
Soybean_TiberR_RFD_lo
Soybean_TigrEuphR_IRR_hi
Soybean_TigrEuphR_IRR_lo
Soybean_TigrEuphR_RFD_hi
Soybean_TigrEuphR_RFD_lo
Soybean_TocantinsR_IRR_hi
Soybean_TocantinsR_IRR_lo
Soybean_TocantinsR_RFD_hi
Soybean_TocantinsR_RFD_lo
Soybean_UralR_RFD_hi
Soybean_UralR_RFD_lo
Soybean_UsaCstE_IRR_hi
Soybean_UsaCstE_IRR_lo
Soybean_UsaCstE_RFD_hi
Soybean_UsaCstE_RFD_lo
Soybean_UsaCstNE_RFD_hi
Soybean_UsaCstNE_RFD_lo
Soybean_UsaCstSE_IRR_hi
Soybean_UsaCstSE_IRR_lo
Soybean_UsaCstSE_RFD_hi
Soybean_UsaCstSE_RFD_lo
Soybean_VietnamCst_RFD_hi
Soybean_VietnamCst_RFD_lo
Soybean_VolgaR_RFD_hi
Soybean_VolgaR_RFD_lo
Soybean_VoltaR_RFD_hi
Soybean_VoltaR_RFD_lo
Soybean_WislaR_RFD_hi
Soybean_WislaR_RFD_lo
Soybean_XunJiang_IRR_hi
Soybean_XunJiang_IRR_lo
Soybean_XunJiang_RFD_hi
Soybean_XunJiang_RFD_lo
Soybean_Yangtze_IRR_hi
Soybean_Yangtze_IRR_lo
Soybean_Yangtze_RFD_hi
Soybean_Yangtze_RFD_lo
Soybean_YeniseiR_RFD_hi
Soybean_YeniseiR_RFD_lo
Soybean_YucatanP_IRR_hi
Soybean_YucatanP_IRR_lo
Soybean_YucatanP_RFD_hi
Soybean_YucatanP_RFD_lo
Soybean_ZambeziR_IRR_hi
Soybean_ZambeziR_IRR_lo
Soybean_ZambeziR_RFD_hi
Soybean_ZambeziR_RFD_lo
Soybean_ZiyaHe_IRR_hi
Soybean_ZiyaHe_IRR_lo
Soybean_ZiyaHe_RFD_hi

Soybean_ZiyaHe_RFD_lo
sugar cane ethanol
SugarCrop_AdrBlkSea_IRR_hi
SugarCrop_AdrBlkSea_IRR_lo
SugarCrop_AdrBlkSea_RFD_hi
SugarCrop_AdrBlkSea_RFD_lo
SugarCrop_AfrCstNW_IRR_hi
SugarCrop_AfrCstNW_IRR_lo
SugarCrop_AfrCstW_RFD_hi
SugarCrop_AfrCstW_RFD_lo
SugarCrop_AfrIntN_IRR_hi
SugarCrop_AfrIntN_IRR_lo
SugarCrop_AfrIntN_RFD_hi
SugarCrop_AfrIntN_RFD_lo
SugarCrop_AmazonR_RFD_hi
SugarCrop_AmazonR_RFD_lo
SugarCrop_AmuDaryaR_IRR_hi
SugarCrop_AmuDaryaR_IRR_lo
SugarCrop_AmuDaryaR_RFD_hi
SugarCrop_AmuDaryaR_RFD_lo
SugarCrop_AmurR_RFD_hi
SugarCrop_AmurR_RFD_lo
SugarCrop_ArabianSea_RFD_hi
SugarCrop_ArabianSea_RFD_lo
SugarCrop_ArgColoR_RFD_hi
SugarCrop_ArgColoR_RFD_lo
SugarCrop_ArgCstS_RFD_hi
SugarCrop_ArgCstS_RFD_lo
SugarCrop_BalticSea_IRR_hi
SugarCrop_BalticSea_IRR_lo
SugarCrop_BalticSea_RFD_hi
SugarCrop_BalticSea_RFD_lo
SugarCrop_BengalBay_IRR_hi
SugarCrop_BengalBay_IRR_lo
SugarCrop_BengalBay_RFD_hi
SugarCrop_BengalBay_RFD_lo
SugarCrop_BlackSeaN_IRR_hi
SugarCrop_BlackSeaN_IRR_lo
SugarCrop_BlackSeaN_RFD_hi
SugarCrop_BlackSeaN_RFD_lo
SugarCrop_BlackSeaS_IRR_hi
SugarCrop_BlackSeaS_IRR_lo
SugarCrop_BlackSeaS_RFD_hi
SugarCrop_BlackSeaS_RFD_lo
SugarCrop_BoHai_RFD_hi
SugarCrop_BoHai_RFD_lo
SugarCrop_BorneoCstN_IRR_hi
SugarCrop_BorneoCstN_IRR_lo
SugarCrop_BorneoCstN_RFD_hi
SugarCrop_BorneoCstN_RFD_lo
SugarCrop_California_IRR_hi
SugarCrop_California_IRR_lo
SugarCrop_California_RFD_hi
SugarCrop_California_RFD_lo
SugarCrop_CaspianE_IRR_hi
SugarCrop_CaspianE_IRR_lo
SugarCrop_CaspianE_RFD_hi
SugarCrop_CaspianE_RFD_lo
SugarCrop_CaspianNE_IRR_hi
SugarCrop_CaspianNE_IRR_lo
SugarCrop_CaspianNE_RFD_hi
SugarCrop_CaspianNE_RFD_lo
SugarCrop_CaspianSW_IRR_hi
SugarCrop_CaspianSW_IRR_lo
SugarCrop_CaspianSW_RFD_hi
SugarCrop_CaspianSW_RFD_lo
SugarCrop_ChileCstN_IRR_hi
SugarCrop_ChileCstN_IRR_lo
SugarCrop_ChileCstN_RFD_hi
SugarCrop_ChileCstN_RFD_lo
SugarCrop_ChileCstS_IRR_hi
SugarCrop_ChileCstS_IRR_lo
SugarCrop_ChileCstS_RFD_hi
SugarCrop_ChileCstS_RFD_lo
SugarCrop_ChinaCst_RFD_hi
SugarCrop_ChinaCst_RFD_lo
SugarCrop_CntAmer_RFD_hi
SugarCrop_CntAmer_RFD_lo
SugarCrop_ColEcuaCst_RFD_hi
SugarCrop_ColEcuaCst_RFD_lo
SugarCrop_DanubeR_IRR_hi
SugarCrop_DanubeR_IRR_lo
SugarCrop_DanubeR_RFD_hi
SugarCrop_DanubeR_RFD_lo
SugarCrop_DaugavaR_IRR_hi
SugarCrop_DaugavaR_IRR_lo
SugarCrop_DaugavaR_RFD_hi
SugarCrop_DaugavaR_RFD_lo
SugarCrop_DeadSea_IRR_hi
SugarCrop_DeadSea_IRR_lo
SugarCrop_DeadSea_RFD_hi
SugarCrop_DeadSea_RFD_lo
SugarCrop_DnieperR_IRR_hi
SugarCrop_DnieperR_IRR_lo
SugarCrop_DnieperR_RFD_hi
SugarCrop_DnieperR_RFD_lo

SugarCrop_DniesterR_IRR_hi
SugarCrop_DniesterR_IRR_lo
SugarCrop_DniesterR_RFD_hi
SugarCrop_DniesterR_RFD_lo
SugarCrop_DnkGrmCst_IRR_hi
SugarCrop_DnkGrmCst_IRR_lo
SugarCrop_DnkGrmCst_RFD_hi
SugarCrop_DnkGrmCst_RFD_lo
SugarCrop_DonR_IRR_hi
SugarCrop_DonR_IRR_lo
SugarCrop_DonR_RFD_hi
SugarCrop_DonR_RFD_lo
SugarCrop_DouroR_IRR_hi
SugarCrop_DouroR_IRR_lo
SugarCrop_DouroR_RFD_hi
SugarCrop_DouroR_RFD_lo
SugarCrop_EbroR_IRR_hi
SugarCrop_EbroR_IRR_lo
SugarCrop_EbroR_RFD_hi
SugarCrop_EbroR_RFD_lo
SugarCrop_EJrdnSyr_IRR_hi
SugarCrop_EJrdnSyr_IRR_lo
SugarCrop_EJrdnSyr_RFD_hi
SugarCrop_EJrdnSyr_RFD_lo
SugarCrop_ElbeR_IRR_hi
SugarCrop_ElbeR_IRR_lo
SugarCrop_ElbeR_RFD_hi
SugarCrop_ElbeR_RFD_lo
SugarCrop_EmsWeserR_IRR_hi
SugarCrop_EmsWeserR_IRR_lo
SugarCrop_EmsWeserR_RFD_hi
SugarCrop_EmsWeserR_RFD_lo
SugarCrop_EngWales_IRR_hi
SugarCrop_EngWales_IRR_lo
SugarCrop_EngWales_RFD_hi
SugarCrop_EngWales_RFD_lo
SugarCrop_FarahrudR_IRR_hi
SugarCrop_FarahrudR_IRR_lo
SugarCrop_FarahrudR_RFD_hi
SugarCrop_FarahrudR_RFD_lo
SugarCrop_Finland_IRR_hi
SugarCrop_Finland_IRR_lo
SugarCrop_Finland_RFD_hi
SugarCrop_Finland_RFD_lo
SugarCrop_FlyR_RFD_hi
SugarCrop_FlyR_RFD_lo
SugarCrop_FranceCstS_IRR_hi
SugarCrop_FranceCstS_IRR_lo
SugarCrop_FranceCstS_RFD_hi
SugarCrop_FranceCstS_RFD_lo
SugarCrop_FranceCstW_IRR_hi
SugarCrop_FranceCstW_IRR_lo
SugarCrop_FranceCstW_RFD_hi
SugarCrop_FranceCstW_RFD_lo
SugarCrop_GangesR_IRR_hi
SugarCrop_GangesR_IRR_lo
SugarCrop_GangesR_RFD_hi
SugarCrop_GangesR_RFD_lo
SugarCrop_Gironde_IRR_hi
SugarCrop_Gironde_IRR_lo
SugarCrop_Gironde_RFD_hi
SugarCrop_Gironde_RFD_lo
SugarCrop_Gobi_IRR_hi
SugarCrop_Gobi_IRR_lo
SugarCrop_Gobi_RFD_hi
SugarCrop_Gobi_RFD_lo
SugarCrop_GreatBasin_IRR_hi
SugarCrop_GreatBasin_IRR_lo
SugarCrop_GreatBasin_RFD_hi
SugarCrop_GreatBasin_RFD_lo
SugarCrop_GreatLakes_RFD_hi
SugarCrop_GreatLakes_RFD_lo
SugarCrop_GrijUsuR_RFD_hi
SugarCrop_GrijUsuR_RFD_lo
SugarCrop_GuadalqR_IRR_hi
SugarCrop_GuadalqR_IRR_lo
SugarCrop_GuadalqR_RFD_hi
SugarCrop_GuadalqR_RFD_lo
SugarCrop_GuadianaR_IRR_hi
SugarCrop_GuadianaR_IRR_lo
SugarCrop_GuadianaR_RFD_hi
SugarCrop_GuadianaR_RFD_lo
SugarCrop_HamuMashR_RFD_hi
SugarCrop_HamuMashR_RFD_lo
SugarCrop_Helmand_RFD_hi
SugarCrop_Helmand_RFD_lo
SugarCrop_Hong_RFD_hi
SugarCrop_Hong_RFD_lo
SugarCrop_HuangHeR_RFD_hi
SugarCrop_HuangHeR_RFD_lo
SugarCrop_IberiaCst_IRR_hi
SugarCrop_IberiaCst_IRR_lo
SugarCrop_IberiaCst_RFD_hi
SugarCrop_IberiaCst_RFD_lo
SugarCrop_IdnE_IRR_hi
SugarCrop_IdnE_IRR_lo

SugarCrop_IdnE_RFD_hi
SugarCrop_IdnE_RFD_lo
SugarCrop_IndusR_RFD_hi
SugarCrop_IndusR_RFD_lo
SugarCrop_Iran_IRR_hi
SugarCrop_Iran_IRR_lo
SugarCrop_Iran_RFD_hi
SugarCrop_Iran_RFD_lo
SugarCrop_Ireland_RFD_hi
SugarCrop_Ireland_RFD_lo
SugarCrop_IrianJaya_IRR_hi
SugarCrop_IrianJaya_IRR_lo
SugarCrop_IrianJaya_RFD_hi
SugarCrop_IrianJaya_RFD_lo
SugarCrop_IrrawaddyR_IRR_hi
SugarCrop_IrrawaddyR_IRR_lo
SugarCrop_IrrawaddyR_RFD_hi
SugarCrop_IrrawaddyR_RFD_lo
SugarCrop_ItalyCstE_IRR_hi
SugarCrop_ItalyCstE_IRR_lo
SugarCrop_ItalyCstE_RFD_hi
SugarCrop_ItalyCstE_RFD_lo
SugarCrop_ItalyCstW_IRR_hi
SugarCrop_ItalyCstW_IRR_lo
SugarCrop_ItalyCstW_RFD_hi
SugarCrop_ItalyCstW_RFD_lo
SugarCrop_Japan_IRR_hi
SugarCrop_Japan_IRR_lo
SugarCrop_Japan_RFD_hi
SugarCrop_Japan_RFD_lo
SugarCrop_JavaTimor_IRR_hi
SugarCrop_JavaTimor_IRR_lo
SugarCrop_JavaTimor_RFD_hi
SugarCrop_JavaTimor_RFD_lo
SugarCrop_Kalimantan_IRR_hi
SugarCrop_Kalimantan_IRR_lo
SugarCrop_Kalimantan_RFD_hi
SugarCrop_Kalimantan_RFD_lo
SugarCrop_LaPuna_RFD_hi
SugarCrop_LaPuna_RFD_lo
SugarCrop_LBalkash_IRR_hi
SugarCrop_LBalkash_IRR_lo
SugarCrop_LBalkash_RFD_hi
SugarCrop_LBalkash_RFD_lo
SugarCrop_LoireR_IRR_hi
SugarCrop_LoireR_IRR_lo
SugarCrop_LoireR_RFD_hi
SugarCrop_LoireR_RFD_lo
SugarCrop_Mackenzie_RFD_hi
SugarCrop_Mackenzie_RFD_lo
SugarCrop_MagdalenaR_RFD_hi
SugarCrop_MagdalenaR_RFD_lo
SugarCrop_MalaysiaP_IRR_hi
SugarCrop_MalaysiaP_IRR_lo
SugarCrop_MalaysiaP_RFD_hi
SugarCrop_MalaysiaP_RFD_lo
SugarCrop_MeditE_IRR_hi
SugarCrop_MeditE_IRR_lo
SugarCrop_MeditE_RFD_hi
SugarCrop_MeditE_RFD_lo
SugarCrop_MeditIsl_IRR_hi
SugarCrop_MeditIsl_IRR_lo
SugarCrop_MeditIsl_RFD_hi
SugarCrop_MeditIsl_RFD_lo
SugarCrop_MeditS_IRR_hi
SugarCrop_MeditS_IRR_lo
SugarCrop_MeditS_RFD_hi
SugarCrop_MeditS_RFD_lo
SugarCrop_Mekong_IRR_hi
SugarCrop_Mekong_IRR_lo
SugarCrop_Mekong_RFD_hi
SugarCrop_Mekong_RFD_lo
SugarCrop_MexBaja_RFD_hi
SugarCrop_MexBaja_RFD_lo
SugarCrop_MexCstNW_RFD_hi
SugarCrop_MexCstNW_RFD_lo
SugarCrop_MexCstW_RFD_hi
SugarCrop_MexCstW_RFD_lo
SugarCrop_MexGulf_RFD_hi
SugarCrop_MexGulf_RFD_lo
SugarCrop_MexInt_RFD_hi
SugarCrop_MexInt_RFD_lo
SugarCrop_MissouriR_IRR_hi
SugarCrop_MissouriR_IRR_lo
SugarCrop_MissouriR_RFD_hi
SugarCrop_MissouriR_RFD_lo
SugarCrop_MissppRN_IRR_hi
SugarCrop_MissppRN_IRR_lo
SugarCrop_MissppRN_RFD_hi
SugarCrop_MissppRN_RFD_lo
SugarCrop_NarvaR_IRR_hi
SugarCrop_NarvaR_IRR_lo
SugarCrop_NarvaR_RFD_hi
SugarCrop_NarvaR_RFD_lo
SugarCrop_NegroR_RFD_hi
SugarCrop_NegroR_RFD_lo

SugarCrop_NelsonR_IRR_hi
SugarCrop_NelsonR_IRR_lo
SugarCrop_NelsonR_RFD_hi
SugarCrop_NelsonR_RFD_lo
SugarCrop_NemanR_IRR_hi
SugarCrop_NemanR_IRR_lo
SugarCrop_NemanR_RFD_hi
SugarCrop_NemanR_RFD_lo
SugarCrop_NevaR_IRR_hi
SugarCrop_NevaR_IRR_lo
SugarCrop_NevaR_RFD_hi
SugarCrop_NevaR_RFD_lo
SugarCrop_NigerR_RFD_hi
SugarCrop_NigerR_RFD_lo
SugarCrop_NileR_IRR_hi
SugarCrop_NileR_IRR_lo
SugarCrop_NWTerr_RFD_hi
SugarCrop_NWTerr_RFD_lo
SugarCrop_ObR_IRR_hi
SugarCrop_ObR_IRR_lo
SugarCrop_ObR_RFD_hi
SugarCrop_ObR_RFD_lo
SugarCrop_OderR_IRR_hi
SugarCrop_OderR_IRR_lo
SugarCrop_OderR_RFD_hi
SugarCrop_OderR_RFD_lo
SugarCrop_OrinocoR_RFD_hi
SugarCrop_OrinocoR_RFD_lo
SugarCrop_Papaloapan_RFD_hi
SugarCrop_Papaloapan_RFD_lo
SugarCrop_PersianGulf_IRR_hi
SugarCrop_PersianGulf_IRR_lo
SugarCrop_PersianGulf_RFD_hi
SugarCrop_PersianGulf_RFD_lo
SugarCrop_PeruCst_RFD_hi
SugarCrop_PeruCst_RFD_lo
SugarCrop_PolandCst_IRR_hi
SugarCrop_PolandCst_IRR_lo
SugarCrop_PolandCst_RFD_hi
SugarCrop_PolandCst_RFD_lo
SugarCrop_PoR_IRR_hi
SugarCrop_PoR_IRR_lo
SugarCrop_PoR_RFD_hi
SugarCrop_PoR_RFD_lo
SugarCrop_RhineR_IRR_hi
SugarCrop_RhineR_IRR_lo
SugarCrop_RhineR_RFD_hi
SugarCrop_RhineR_RFD_lo
SugarCrop_RhoneR_IRR_hi
SugarCrop_RhoneR_IRR_lo
SugarCrop_RhoneR_RFD_hi
SugarCrop_RhoneR_RFD_lo
SugarCrop_RioBalsas_RFD_hi
SugarCrop_RioBalsas_RFD_lo
SugarCrop_RioGrande_RFD_hi
SugarCrop_RioGrande_RFD_lo
SugarCrop_RioLerma_RFD_hi
SugarCrop_RioLerma_RFD_lo
SugarCrop_RioVerde_RFD_hi
SugarCrop_RioVerde_RFD_lo
SugarCrop_RusCstSE_RFD_hi
SugarCrop_RusCstSE_RFD_lo
SugarCrop_SabarmatiR_RFD_hi
SugarCrop_SabarmatiR_RFD_lo
SugarCrop_Salween_IRR_hi
SugarCrop_Salween_IRR_lo
SugarCrop_Salween_RFD_hi
SugarCrop_Salween_RFD_lo
SugarCrop_SAmerCstN_RFD_hi
SugarCrop_SAmerCstN_RFD_lo
SugarCrop_SAmerCstNE_RFD_hi
SugarCrop_SAmerCstNE_RFD_lo
SugarCrop_ScheldtR_IRR_hi
SugarCrop_ScheldtR_IRR_lo
SugarCrop_ScheldtR_RFD_hi
SugarCrop_ScheldtR_RFD_lo
SugarCrop_SChinaSea_RFD_hi
SugarCrop_SChinaSea_RFD_lo
SugarCrop_Scotland_RFD_hi
SugarCrop_Scotland_RFD_lo
SugarCrop_SeineR_IRR_hi
SugarCrop_SeineR_IRR_lo
SugarCrop_SeineR_RFD_hi
SugarCrop_SeineR_RFD_lo
SugarCrop_SenegalR_RFD_hi
SugarCrop_SenegalR_RFD_lo
SugarCrop_SepikR_RFD_hi
SugarCrop_SepikR_RFD_lo
SugarCrop_SinaiP_IRR_hi
SugarCrop_SinaiP_IRR_lo
SugarCrop_SittaungR_IRR_hi
SugarCrop_SittaungR_IRR_lo
SugarCrop_SittaungR_RFD_hi
SugarCrop_SittaungR_RFD_lo
SugarCrop_SpainCstSE_IRR_hi
SugarCrop_SpainCstSE_IRR_lo

SugarCrop_SpainCstSE_RFD_hi
SugarCrop_SpainCstSE_RFD_lo
SugarCrop_Sulawesi_IRR_hi
SugarCrop_Sulawesi_IRR_lo
SugarCrop_Sulawesi_RFD_hi
SugarCrop_Sulawesi_RFD_lo
SugarCrop_Sumatra_IRR_hi
SugarCrop_Sumatra_IRR_lo
SugarCrop_Sumatra_RFD_hi
SugarCrop_Sumatra_RFD_lo
SugarCrop_Sweden_IRR_hi
SugarCrop_Sweden_IRR_lo
SugarCrop_Sweden_RFD_hi
SugarCrop_Sweden_RFD_lo
SugarCrop_SyrDaryaR_IRR_hi
SugarCrop_SyrDaryaR_IRR_lo
SugarCrop_SyrDaryaR_RFD_hi
SugarCrop_SyrDaryaR_RFD_lo
SugarCrop_TagusR_IRR_hi
SugarCrop_TagusR_IRR_lo
SugarCrop_TagusR_RFD_hi
SugarCrop_TagusR_RFD_lo
SugarCrop_Taiwan_IRR_hi
SugarCrop_Taiwan_IRR_lo
SugarCrop_Taiwan_RFD_hi
SugarCrop_Taiwan_RFD_lo
SugarCrop_Tarim_RFD_hi
SugarCrop_Tarim_RFD_lo
SugarCrop_Tehuantpc_RFD_hi
SugarCrop_Tehuantpc_RFD_lo
SugarCrop_TiberR_IRR_hi
SugarCrop_TiberR_IRR_lo
SugarCrop_TiberR_RFD_hi
SugarCrop_TiberR_RFD_lo
SugarCrop_TigrEuphR_IRR_hi
SugarCrop_TigrEuphR_IRR_lo
SugarCrop_TigrEuphR_RFD_hi
SugarCrop_TigrEuphR_RFD_lo
SugarCrop_UralR_IRR_hi
SugarCrop_UralR_IRR_lo
SugarCrop_UralR_RFD_hi
SugarCrop_UralR_RFD_lo
SugarCrop_UsaColoRN_IRR_hi
SugarCrop_UsaColoRN_IRR_lo
SugarCrop_UsaColoRN_RFD_hi
SugarCrop_UsaColoRN_RFD_lo
SugarCrop_UsaColoRS_IRR_hi
SugarCrop_UsaColoRS_IRR_lo
SugarCrop_UsaColoRS_RFD_hi
SugarCrop_UsaColoRS_RFD_lo
SugarCrop_UsaPacNW_IRR_hi
SugarCrop_UsaPacNW_IRR_lo
SugarCrop_UsaPacNW_RFD_hi
SugarCrop_UsaPacNW_RFD_lo
SugarCrop_VolgaR_IRR_hi
SugarCrop_VolgaR_IRR_lo
SugarCrop_VolgaR_RFD_hi
SugarCrop_VolgaR_RFD_lo
SugarCrop_VoltaR_RFD_hi
SugarCrop_VoltaR_RFD_lo
SugarCrop_WislaR_IRR_hi
SugarCrop_WislaR_IRR_lo
SugarCrop_WislaR_RFD_hi
SugarCrop_WislaR_RFD_lo
SugarCrop_XunJiang_RFD_hi
SugarCrop_XunJiang_RFD_lo
SugarCrop_Yangtze_RFD_hi
SugarCrop_Yangtze_RFD_lo
SugarCrop_YucatanP_RFD_hi
SugarCrop_YucatanP_RFD_lo
SugarCrop_ZiyaHe_RFD_hi
SugarCrop_ZiyaHe_RFD_lo
SugarCropC4_AfrCstE_IRR_hi
SugarCropC4_AfrCstE_IRR_lo
SugarCropC4_AfrCstE_RFD_hi
SugarCropC4_AfrCstE_RFD_lo
SugarCropC4_AfrCstNE_IRR_hi
SugarCropC4_AfrCstNE_IRR_lo
SugarCropC4_AfrCstNW_IRR_hi
SugarCropC4_AfrCstNW_IRR_lo
SugarCropC4_AfrCstS_IRR_hi
SugarCropC4_AfrCstS_IRR_lo
SugarCropC4_AfrCstS_RFD_hi
SugarCropC4_AfrCstS_RFD_lo
SugarCropC4_AfrCstSE_IRR_hi
SugarCropC4_AfrCstSE_IRR_lo
SugarCropC4_AfrCstSE_RFD_hi
SugarCropC4_AfrCstSE_RFD_lo
SugarCropC4_AfrCstSSW_IRR_hi
SugarCropC4_AfrCstSSW_IRR_lo
SugarCropC4_AfrCstW_IRR_hi
SugarCropC4_AfrCstW_IRR_lo
SugarCropC4_AfrCstW_RFD_hi
SugarCropC4_AfrCstW_RFD_lo
SugarCropC4_AfrIntN_IRR_hi
SugarCropC4_AfrIntN_IRR_lo

SugarCropC4_AfrIntN_RFD_hi
SugarCropC4_AfrIntN_RFD_lo
SugarCropC4_AfrIntS_IRR_hi
SugarCropC4_AfrIntS_IRR_lo
SugarCropC4_AfrIntS_RFD_hi
SugarCropC4_AfrIntS_RFD_lo
SugarCropC4_AmazonR_IRR_hi
SugarCropC4_AmazonR_IRR_lo
SugarCropC4_AmazonR_RFD_hi
SugarCropC4_AmazonR_RFD_lo
SugarCropC4_AngolaCst_IRR_hi
SugarCropC4_AngolaCst_IRR_lo
SugarCropC4_AngolaCst_RFD_hi
SugarCropC4_AngolaCst_RFD_lo
SugarCropC4_ArabianP_RFD_hi
SugarCropC4_ArabianP_RFD_lo
SugarCropC4_ArabianSea_IRR_hi
SugarCropC4_ArabianSea_IRR_lo
SugarCropC4_ArabianSea_RFD_hi
SugarCropC4_ArabianSea_RFD_lo
SugarCropC4_AusCstE_IRR_hi
SugarCropC4_AusCstE_IRR_lo
SugarCropC4_AusCstE_RFD_hi
SugarCropC4_AusCstE_RFD_lo
SugarCropC4_AusCstN_IRR_hi
SugarCropC4_AusCstN_IRR_lo
SugarCropC4_AusCstN_RFD_hi
SugarCropC4_AusCstN_RFD_lo
SugarCropC4_BengalBay_IRR_hi
SugarCropC4_BengalBay_IRR_lo
SugarCropC4_BengalBay_RFD_hi
SugarCropC4_BengalBay_RFD_lo
SugarCropC4_BengalW_IRR_hi
SugarCropC4_BengalW_IRR_lo
SugarCropC4_BengalW_RFD_hi
SugarCropC4_BengalW_RFD_lo
SugarCropC4_BorneoCstN_IRR_hi
SugarCropC4_BorneoCstN_IRR_lo
SugarCropC4_BorneoCstN_RFD_hi
SugarCropC4_BorneoCstN_RFD_lo
SugarCropC4_BrahmaniR_IRR_hi
SugarCropC4_BrahmaniR_IRR_lo
SugarCropC4_BrahmaniR_RFD_hi
SugarCropC4_BrahmaniR_RFD_lo
SugarCropC4_BrzCstE_IRR_hi
SugarCropC4_BrzCstE_IRR_lo
SugarCropC4_BrzCstE_RFD_hi
SugarCropC4_BrzCstE_RFD_lo
SugarCropC4_BrzCstN_IRR_hi
SugarCropC4_BrzCstN_IRR_lo
SugarCropC4_BrzCstN_RFD_hi
SugarCropC4_BrzCstN_RFD_lo
SugarCropC4_BrzCstS_IRR_hi
SugarCropC4_BrzCstS_IRR_lo
SugarCropC4_BrzCstS_RFD_hi
SugarCropC4_BrzCstS_RFD_lo
SugarCropC4_Caribbean_IRR_hi
SugarCropC4_Caribbean_IRR_lo
SugarCropC4_Caribbean_RFD_hi
SugarCropC4_Caribbean_RFD_lo
SugarCropC4_CaspianE_RFD_hi
SugarCropC4_CaspianE_RFD_lo
SugarCropC4_CaspianSW_RFD_hi
SugarCropC4_CaspianSW_RFD_lo
SugarCropC4_CauveryR_IRR_hi
SugarCropC4_CauveryR_IRR_lo
SugarCropC4_CauveryR_RFD_hi
SugarCropC4_CauveryR_RFD_lo
SugarCropC4_ChaoPhrR_IRR_hi
SugarCropC4_ChaoPhrR_IRR_lo
SugarCropC4_ChaoPhrR_RFD_hi
SugarCropC4_ChaoPhrR_RFD_lo
SugarCropC4_ChinaCst_IRR_hi
SugarCropC4_ChinaCst_IRR_lo
SugarCropC4_ChinaCst_RFD_hi
SugarCropC4_ChinaCst_RFD_lo
SugarCropC4_CntAmer_IRR_hi
SugarCropC4_CntAmer_IRR_lo
SugarCropC4_CntAmer_RFD_hi
SugarCropC4_CntAmer_RFD_lo
SugarCropC4_ColEcuaCst_IRR_hi
SugarCropC4_ColEcuaCst_IRR_lo
SugarCropC4_ColEcuaCst_RFD_hi
SugarCropC4_ColEcuaCst_RFD_lo
SugarCropC4_CongoR_IRR_hi
SugarCropC4_CongoR_IRR_lo
SugarCropC4_CongoR_RFD_hi
SugarCropC4_CongoR_RFD_lo
SugarCropC4_DeadSea_RFD_hi
SugarCropC4_DeadSea_RFD_lo
SugarCropC4_DouroR_IRR_hi
SugarCropC4_DouroR_IRR_lo
SugarCropC4_DouroR_RFD_hi
SugarCropC4_DouroR_RFD_lo
SugarCropC4_EbroR_IRR_hi
SugarCropC4_EbroR_IRR_lo

SugarCropC4_EbroR_RFD_hi
SugarCropC4_EbroR_RFD_lo
SugarCropC4_EJrdnSyr_RFD_hi
SugarCropC4_EJrdnSyr_RFD_lo
SugarCropC4_FarahrudR_RFD_hi
SugarCropC4_FarahrudR_RFD_lo
SugarCropC4_FlyR_RFD_hi
SugarCropC4_FlyR_RFD_lo
SugarCropC4_FranceCstS_IRR_hi
SugarCropC4_GangesR_IRR_hi
SugarCropC4_GangesR_IRR_lo
SugarCropC4_GangesR_RFD_hi
SugarCropC4_GangesR_RFD_lo
SugarCropC4_GodavariR_IRR_hi
SugarCropC4_GodavariR_IRR_lo
SugarCropC4_GodavariR_RFD_hi
SugarCropC4_GodavariR_RFD_lo
SugarCropC4_GrijUsuR_IRR_hi
SugarCropC4_GrijUsuR_IRR_lo
SugarCropC4_GrijUsuR_RFD_hi
SugarCropC4_GrijUsuR_RFD_lo
SugarCropC4_GuadalqR_IRR_hi
SugarCropC4_GuadalqR_IRR_lo
SugarCropC4_GuadalqR_RFD_hi
SugarCropC4_GuadalqR_RFD_lo
SugarCropC4_GuadianaR_IRR_hi
SugarCropC4_GuadianaR_IRR_lo
SugarCropC4_GuadianaR_RFD_hi
SugarCropC4_GuadianaR_RFD_lo
SugarCropC4_GuineaGulf_IRR_hi
SugarCropC4_GuineaGulf_IRR_lo
SugarCropC4_GuineaGulf_RFD_hi
SugarCropC4_GuineaGulf_RFD_lo
SugarCropC4_Hainan_IRR_hi
SugarCropC4_Hainan_IRR_lo
SugarCropC4_Hainan_RFD_hi
SugarCropC4_Hainan_RFD_lo
SugarCropC4_HamuMashR_IRR_hi
SugarCropC4_HamuMashR_IRR_lo
SugarCropC4_HamuMashR_RFD_hi
SugarCropC4_HamuMashR_RFD_lo
SugarCropC4_Helmand_IRR_hi
SugarCropC4_Helmand_IRR_lo
SugarCropC4_Helmand_RFD_hi
SugarCropC4_Helmand_RFD_lo
SugarCropC4_Hong_IRR_hi
SugarCropC4_Hong_IRR_lo
SugarCropC4_Hong_RFD_hi
SugarCropC4_Hong_RFD_lo
SugarCropC4_HuangHeR_IRR_hi
SugarCropC4_HuangHeR_IRR_lo
SugarCropC4_IberiaCst_IRR_hi
SugarCropC4_IberiaCst_IRR_lo
SugarCropC4_IdnE_IRR_hi
SugarCropC4_IdnE_IRR_lo
SugarCropC4_IdnE_RFD_hi
SugarCropC4_IdnE_RFD_lo
SugarCropC4_IndCstE_IRR_hi
SugarCropC4_IndCstE_IRR_lo
SugarCropC4_IndCstE_RFD_hi
SugarCropC4_IndCstE_RFD_lo
SugarCropC4_IndCstNE_IRR_hi
SugarCropC4_IndCstNE_IRR_lo
SugarCropC4_IndCstS_IRR_hi
SugarCropC4_IndCstS_IRR_lo
SugarCropC4_IndCstS_RFD_hi
SugarCropC4_IndCstS_RFD_lo
SugarCropC4_IndCstW_IRR_hi
SugarCropC4_IndCstW_IRR_lo
SugarCropC4_IndCstW_RFD_hi
SugarCropC4_IndCstW_RFD_lo
SugarCropC4_IndusR_IRR_hi
SugarCropC4_IndusR_IRR_lo
SugarCropC4_IndusR_RFD_hi
SugarCropC4_IndusR_RFD_lo
SugarCropC4_Iran_RFD_hi
SugarCropC4_Iran_RFD_lo
SugarCropC4_IrianJaya_IRR_hi
SugarCropC4_IrianJaya_IRR_lo
SugarCropC4_IrianJaya_RFD_hi
SugarCropC4_IrianJaya_RFD_lo
SugarCropC4_IrrawaddyR_IRR_hi
SugarCropC4_IrrawaddyR_IRR_lo
SugarCropC4_IrrawaddyR_RFD_hi
SugarCropC4_IrrawaddyR_RFD_lo
SugarCropC4_Japan_IRR_hi
SugarCropC4_Japan_IRR_lo
SugarCropC4_Japan_RFD_hi
SugarCropC4_Japan_RFD_lo
SugarCropC4_JavaTimor_IRR_hi
SugarCropC4_JavaTimor_IRR_lo
SugarCropC4_JavaTimor_RFD_hi
SugarCropC4_JavaTimor_RFD_lo
SugarCropC4_Kalimantan_IRR_hi
SugarCropC4_Kalimantan_IRR_lo
SugarCropC4_Kalimantan_RFD_hi

SugarCropC4_Kalimantan_RFD_lo
SugarCropC4_KrishnaR_IRR_hi
SugarCropC4_KrishnaR_IRR_lo
SugarCropC4_KrishnaR_RFD_hi
SugarCropC4_KrishnaR_RFD_lo
SugarCropC4_LaPuna_IRR_hi
SugarCropC4_LaPuna_IRR_lo
SugarCropC4_LaPuna_RFD_hi
SugarCropC4_LaPuna_RFD_lo
SugarCropC4_LChad_IRR_hi
SugarCropC4_LChad_IRR_lo
SugarCropC4_LChad_RFD_hi
SugarCropC4_LChad_RFD_lo
SugarCropC4_LimpopoR_IRR_hi
SugarCropC4_LimpopoR_IRR_lo
SugarCropC4_LimpopoR_RFD_hi
SugarCropC4_LimpopoR_RFD_lo
SugarCropC4_Madagascar_IRR_hi
SugarCropC4_Madagascar_IRR_lo
SugarCropC4_Madagascar_RFD_hi
SugarCropC4_Madagascar_RFD_lo
SugarCropC4_MagdalenaR_IRR_hi
SugarCropC4_MagdalenaR_IRR_lo
SugarCropC4_MagdalenaR_RFD_hi
SugarCropC4_MagdalenaR_RFD_lo
SugarCropC4_MahanadiR_IRR_hi
SugarCropC4_MahanadiR_IRR_lo
SugarCropC4_MahanadiR_RFD_hi
SugarCropC4_MahanadiR_RFD_lo
SugarCropC4_MahiR_IRR_hi
SugarCropC4_MahiR_IRR_lo
SugarCropC4_MahiR_RFD_hi
SugarCropC4_MahiR_RFD_lo
SugarCropC4_MalaysiaP_IRR_hi
SugarCropC4_MalaysiaP_IRR_lo
SugarCropC4_MalaysiaP_RFD_hi
SugarCropC4_MalaysiaP_RFD_lo
SugarCropC4_MarChiq_IRR_hi
SugarCropC4_MarChiq_IRR_lo
SugarCropC4_MarChiq_RFD_hi
SugarCropC4_MarChiq_RFD_lo
SugarCropC4_MeditE_IRR_hi
SugarCropC4_MeditE_IRR_lo
SugarCropC4_MeditE_RFD_hi
SugarCropC4_MeditE_RFD_lo
SugarCropC4_MeditIsl_IRR_hi
SugarCropC4_MeditIsl_IRR_lo
SugarCropC4_MeditS_IRR_hi
SugarCropC4_MeditS_IRR_lo
SugarCropC4_Mekong_IRR_hi
SugarCropC4_Mekong_IRR_lo
SugarCropC4_Mekong_RFD_hi
SugarCropC4_Mekong_RFD_lo
SugarCropC4_MexBaja_IRR_hi
SugarCropC4_MexBaja_IRR_lo
SugarCropC4_MexBaja_RFD_hi
SugarCropC4_MexBaja_RFD_lo
SugarCropC4_MexCstNW_IRR_hi
SugarCropC4_MexCstNW_IRR_lo
SugarCropC4_MexCstNW_RFD_hi
SugarCropC4_MexCstNW_RFD_lo
SugarCropC4_MexCstW_IRR_hi
SugarCropC4_MexCstW_IRR_lo
SugarCropC4_MexCstW_RFD_hi
SugarCropC4_MexCstW_RFD_lo
SugarCropC4_MexGulf_IRR_hi
SugarCropC4_MexGulf_IRR_lo
SugarCropC4_MexGulf_RFD_hi
SugarCropC4_MexGulf_RFD_lo
SugarCropC4_MexInt_IRR_hi
SugarCropC4_MexInt_IRR_lo
SugarCropC4_MexInt_RFD_hi
SugarCropC4_MexInt_RFD_lo
SugarCropC4_MissppRS_IRR_hi
SugarCropC4_MissppRS_IRR_lo
SugarCropC4_MissppRS_RFD_hi
SugarCropC4_MissppRS_RFD_lo
SugarCropC4_MurrayDrlg_IRR_hi
SugarCropC4_MurrayDrlg_IRR_lo
SugarCropC4_MurrayDrlg_RFD_hi
SugarCropC4_MurrayDrlg_RFD_lo
SugarCropC4_NarmadaR_IRR_hi
SugarCropC4_NarmadaR_IRR_lo
SugarCropC4_NarmadaR_RFD_hi
SugarCropC4_NarmadaR_RFD_lo
SugarCropC4_NewCaledn_RFD_hi
SugarCropC4_NewCaledn_RFD_lo
SugarCropC4_NigerR_IRR_hi
SugarCropC4_NigerR_IRR_lo
SugarCropC4_NigerR_RFD_hi
SugarCropC4_NigerR_RFD_lo
SugarCropC4_NileR_IRR_hi
SugarCropC4_NileR_IRR_lo
SugarCropC4_NileR_RFD_hi
SugarCropC4_NileR_RFD_lo
SugarCropC4_OrangeR_IRR_hi

SugarCropC4_OrangeR_IRR_lo
SugarCropC4_OrinocoR_IRR_hi
SugarCropC4_OrinocoR_IRR_lo
SugarCropC4_OrinocoR_RFD_hi
SugarCropC4_OrinocoR_RFD_lo
SugarCropC4_Papaloapan_IRR_hi
SugarCropC4_Papaloapan_IRR_lo
SugarCropC4_Papaloapan_RFD_hi
SugarCropC4_Papaloapan_RFD_lo
SugarCropC4_PapuaCst_RFD_hi
SugarCropC4_PapuaCst_RFD_lo
SugarCropC4_ParnaibaR_IRR_hi
SugarCropC4_ParnaibaR_IRR_lo
SugarCropC4_ParnaibaR_RFD_hi
SugarCropC4_ParnaibaR_RFD_lo
SugarCropC4_PennarR_IRR_hi
SugarCropC4_PennarR_IRR_lo
SugarCropC4_PersianGulf_RFD_hi
SugarCropC4_PersianGulf_RFD_lo
SugarCropC4_PeruCst_IRR_hi
SugarCropC4_PeruCst_IRR_lo
SugarCropC4_PeruCst_RFD_hi
SugarCropC4_PeruCst_RFD_lo
SugarCropC4_Phlppns_IRR_hi
SugarCropC4_Phlppns_IRR_lo
SugarCropC4_Phlppns_RFD_hi
SugarCropC4_Phlppns_RFD_lo
SugarCropC4_RiftValley_IRR_hi
SugarCropC4_RiftValley_IRR_lo
SugarCropC4_RiftValley_RFD_hi
SugarCropC4_RiftValley_RFD_lo
SugarCropC4_RioBalsas_IRR_hi
SugarCropC4_RioBalsas_IRR_lo
SugarCropC4_RioBalsas_RFD_hi
SugarCropC4_RioBalsas_RFD_lo
SugarCropC4_RioGrande_IRR_hi
SugarCropC4_RioGrande_IRR_lo
SugarCropC4_RioGrande_RFD_hi
SugarCropC4_RioGrande_RFD_lo
SugarCropC4_RioLaPlata_IRR_hi
SugarCropC4_RioLaPlata_IRR_lo
SugarCropC4_RioLaPlata_RFD_hi
SugarCropC4_RioLaPlata_RFD_lo
SugarCropC4_RioLerma_IRR_hi
SugarCropC4_RioLerma_IRR_lo
SugarCropC4_RioLerma_RFD_hi
SugarCropC4_RioLerma_RFD_lo
SugarCropC4_RioVerde_IRR_hi
SugarCropC4_RioVerde_IRR_lo
SugarCropC4_RioVerde_RFD_hi
SugarCropC4_RioVerde_RFD_lo
SugarCropC4_SabarmatiR_IRR_hi
SugarCropC4_SabarmatiR_IRR_lo
SugarCropC4_SabarmatiR_RFD_hi
SugarCropC4_SabarmatiR_RFD_lo
SugarCropC4_Salinas_RFD_hi
SugarCropC4_Salinas_RFD_lo
SugarCropC4_Salween_IRR_hi
SugarCropC4_Salween_IRR_lo
SugarCropC4_Salween_RFD_hi
SugarCropC4_Salween_RFD_lo
SugarCropC4_SAmerCstN_IRR_hi
SugarCropC4_SAmerCstN_IRR_lo
SugarCropC4_SAmerCstN_RFD_hi
SugarCropC4_SAmerCstN_RFD_lo
SugarCropC4_SAmerCstNE_IRR_hi
SugarCropC4_SAmerCstNE_IRR_lo
SugarCropC4_SAmerCstNE_RFD_hi
SugarCropC4_SAmerCstNE_RFD_lo
SugarCropC4_SaoFrancR_IRR_hi
SugarCropC4_SaoFrancR_IRR_lo
SugarCropC4_SaoFrancR_RFD_hi
SugarCropC4_SaoFrancR_RFD_lo
SugarCropC4_SChinaSea_IRR_hi
SugarCropC4_SChinaSea_IRR_lo
SugarCropC4_SChinaSea_RFD_hi
SugarCropC4_SChinaSea_RFD_lo
SugarCropC4_SenegalR_IRR_hi
SugarCropC4_SenegalR_IRR_lo
SugarCropC4_SenegalR_RFD_hi
SugarCropC4_SenegalR_RFD_lo
SugarCropC4_SepikR_RFD_hi
SugarCropC4_SepikR_RFD_lo
SugarCropC4_ShebJubR_IRR_hi
SugarCropC4_ShebJubR_IRR_lo
SugarCropC4_ShebJubR_RFD_hi
SugarCropC4_ShebJubR_RFD_lo
SugarCropC4_SinaiP_IRR_hi
SugarCropC4_SinaiP_IRR_lo
SugarCropC4_SittaungR_IRR_hi
SugarCropC4_SittaungR_IRR_lo
SugarCropC4_SittaungR_RFD_hi
SugarCropC4_SittaungR_RFD_lo
SugarCropC4_SpainCstSE_IRR_hi
SugarCropC4_SpainCstSE_IRR_lo
SugarCropC4_SpainCstSE_RFD_hi

SugarCropC4_SpainCstSE_RFD_lo
SugarCropC4_SriLanka_IRR_hi
SugarCropC4_SriLanka_IRR_lo
SugarCropC4_Sulawesi_IRR_hi
SugarCropC4_Sulawesi_IRR_lo
SugarCropC4_Sulawesi_RFD_hi
SugarCropC4_Sulawesi_RFD_lo
SugarCropC4_Sumatra_IRR_hi
SugarCropC4_Sumatra_IRR_lo
SugarCropC4_Sumatra_RFD_hi
SugarCropC4_Sumatra_RFD_lo
SugarCropC4_TagusR_IRR_hi
SugarCropC4_TagusR_IRR_lo
SugarCropC4_TagusR_RFD_hi
SugarCropC4_TagusR_RFD_lo
SugarCropC4_Taiwan_IRR_hi
SugarCropC4_Taiwan_IRR_lo
SugarCropC4_Taiwan_RFD_hi
SugarCropC4_Taiwan_RFD_lo
SugarCropC4_TaptiR_IRR_hi
SugarCropC4_TaptiR_IRR_lo
SugarCropC4_TaptiR_RFD_hi
SugarCropC4_TaptiR_RFD_lo
SugarCropC4_Tehuantpc_IRR_hi
SugarCropC4_Tehuantpc_IRR_lo
SugarCropC4_Tehuantpc_RFD_hi
SugarCropC4_Tehuantpc_RFD_lo
SugarCropC4_TexasCst_IRR_hi
SugarCropC4_TexasCst_IRR_lo
SugarCropC4_TexasCst_RFD_hi
SugarCropC4_TexasCst_RFD_lo
SugarCropC4_ThaiGulf_IRR_hi
SugarCropC4_ThaiGulf_IRR_lo
SugarCropC4_ThaiGulf_RFD_hi
SugarCropC4_ThaiGulf_RFD_lo
SugarCropC4_TigrEuphR_RFD_hi
SugarCropC4_TigrEuphR_RFD_lo
SugarCropC4_TocantinsR_IRR_hi
SugarCropC4_TocantinsR_IRR_lo
SugarCropC4_TocantinsR_RFD_hi
SugarCropC4_TocantinsR_RFD_lo
SugarCropC4_UsaCstSE_IRR_hi
SugarCropC4_UsaCstSE_IRR_lo
SugarCropC4_UsaCstSE_RFD_hi
SugarCropC4_UsaCstSE_RFD_lo
SugarCropC4_VietnamCst_IRR_hi
SugarCropC4_VietnamCst_IRR_lo
SugarCropC4_VietnamCst_RFD_hi
SugarCropC4_VietnamCst_RFD_lo
SugarCropC4_VoltaR_IRR_hi
SugarCropC4_VoltaR_IRR_lo
SugarCropC4_VoltaR_RFD_hi
SugarCropC4_VoltaR_RFD_lo
SugarCropC4_XunJiang_IRR_hi
SugarCropC4_XunJiang_IRR_lo
SugarCropC4_XunJiang_RFD_hi
SugarCropC4_XunJiang_RFD_lo
SugarCropC4_Yangtze_IRR_hi
SugarCropC4_Yangtze_IRR_lo
SugarCropC4_Yangtze_RFD_hi
SugarCropC4_Yangtze_RFD_lo
SugarCropC4_YucatanP_IRR_hi
SugarCropC4_YucatanP_IRR_lo
SugarCropC4_YucatanP_RFD_hi
SugarCropC4_YucatanP_RFD_lo
SugarCropC4_ZambeziR_IRR_hi
SugarCropC4_ZambeziR_IRR_lo
SugarCropC4_ZambeziR_RFD_hi
SugarCropC4_ZambeziR_RFD_lo
SugarCropC4_ZiyaHe_IRR_hi
SugarCropC4_ZiyaHe_IRR_lo
traditional biomass
Vegetables_AdrBlkSea_IRR_hi
Vegetables_AdrBlkSea_IRR_lo
Vegetables_AdrBlkSea_RFD_hi
Vegetables_AdrBlkSea_RFD_lo
Vegetables_AfrCstE_IRR_hi
Vegetables_AfrCstE_IRR_lo
Vegetables_AfrCstE_RFD_hi
Vegetables_AfrCstE_RFD_lo
Vegetables_AfrCstNE_IRR_hi
Vegetables_AfrCstNE_IRR_lo
Vegetables_AfrCstNE_RFD_hi
Vegetables_AfrCstNE_RFD_lo
Vegetables_AfrCstNW_IRR_hi
Vegetables_AfrCstNW_IRR_lo
Vegetables_AfrCstNW_RFD_hi
Vegetables_AfrCstNW_RFD_lo
Vegetables_AfrCstS_IRR_hi
Vegetables_AfrCstS_IRR_lo
Vegetables_AfrCstS_RFD_hi
Vegetables_AfrCstS_RFD_lo
Vegetables_AfrCstSE_IRR_hi
Vegetables_AfrCstSE_IRR_lo
Vegetables_AfrCstSE_RFD_hi
Vegetables_AfrCstSE_RFD_lo

Vegetables_AfrCstSSW_IRR_hi
Vegetables_AfrCstSSW_IRR_lo
Vegetables_AfrCstSSW_RFD_hi
Vegetables_AfrCstSSW_RFD_lo
Vegetables_AfrCstSW_IRR_hi
Vegetables_AfrCstSW_IRR_lo
Vegetables_AfrCstSW_RFD_hi
Vegetables_AfrCstSW_RFD_lo
Vegetables_AfrCstW_IRR_hi
Vegetables_AfrCstW_IRR_lo
Vegetables_AfrCstW_RFD_hi
Vegetables_AfrCstW_RFD_lo
Vegetables_AfrIntN_IRR_hi
Vegetables_AfrIntN_IRR_lo
Vegetables_AfrIntN_RFD_hi
Vegetables_AfrIntN_RFD_lo
Vegetables_AfrIntS_IRR_hi
Vegetables_AfrIntS_IRR_lo
Vegetables_AfrIntS_RFD_hi
Vegetables_AfrIntS_RFD_lo
Vegetables_AmazonR_IRR_hi
Vegetables_AmazonR_IRR_lo
Vegetables_AmazonR_RFD_hi
Vegetables_AmazonR_RFD_lo
Vegetables_AmuDaryaR_IRR_hi
Vegetables_AmuDaryaR_IRR_lo
Vegetables_AmuDaryaR_RFD_hi
Vegetables_AmuDaryaR_RFD_lo
Vegetables_AmurR_IRR_hi
Vegetables_AmurR_IRR_lo
Vegetables_AmurR_RFD_hi
Vegetables_AmurR_RFD_lo
Vegetables_AngolaCst_IRR_hi
Vegetables_AngolaCst_IRR_lo
Vegetables_AngolaCst_RFD_hi
Vegetables_AngolaCst_RFD_lo
Vegetables_ArabianP_IRR_hi
Vegetables_ArabianP_IRR_lo
Vegetables_ArabianP_RFD_hi
Vegetables_ArabianP_RFD_lo
Vegetables_ArabianSea_IRR_hi
Vegetables_ArabianSea_IRR_lo
Vegetables_ArgColoR_IRR_hi
Vegetables_ArgColoR_IRR_lo
Vegetables_ArgColoR_RFD_hi
Vegetables_ArgColoR_RFD_lo
Vegetables_ArgCstN_IRR_hi
Vegetables_ArgCstN_IRR_lo
Vegetables_ArgCstN_RFD_hi
Vegetables_ArgCstN_RFD_lo
Vegetables_ArgCstS_IRR_hi
Vegetables_ArgCstS_IRR_lo
Vegetables_ArgCstS_RFD_hi
Vegetables_ArgCstS_RFD_lo
Vegetables_ArkWhtRedR_IRR_hi
Vegetables_ArkWhtRedR_IRR_lo
Vegetables_ArkWhtRedR_RFD_hi
Vegetables_ArkWhtRedR_RFD_lo
Vegetables_AusCstE_IRR_hi
Vegetables_AusCstE_IRR_lo
Vegetables_AusCstE_RFD_hi
Vegetables_AusCstE_RFD_lo
Vegetables_AusCstN_RFD_hi
Vegetables_AusCstN_RFD_lo
Vegetables_AusCstS_IRR_hi
Vegetables_AusCstS_IRR_lo
Vegetables_AusCstS_RFD_hi
Vegetables_AusCstS_RFD_lo
Vegetables_AusCstW_IRR_hi
Vegetables_AusCstW_IRR_lo
Vegetables_AusCstW_RFD_hi
Vegetables_AusCstW_RFD_lo
Vegetables_AusInt_RFD_hi
Vegetables_AusInt_RFD_lo
Vegetables_BalticSea_IRR_hi
Vegetables_BalticSea_IRR_lo
Vegetables_BalticSea_RFD_hi
Vegetables_BalticSea_RFD_lo
Vegetables_BarentsSea_IRR_hi
Vegetables_BarentsSea_IRR_lo
Vegetables_BarentsSea_RFD_hi
Vegetables_BarentsSea_RFD_lo
Vegetables_BengalBay_IRR_hi
Vegetables_BengalBay_IRR_lo
Vegetables_BengalBay_RFD_hi
Vegetables_BengalBay_RFD_lo
Vegetables_BengalW_IRR_hi
Vegetables_BengalW_IRR_lo
Vegetables_BengalW_RFD_hi
Vegetables_BengalW_RFD_lo
Vegetables_BlackSeaN_IRR_hi
Vegetables_BlackSeaN_IRR_lo
Vegetables_BlackSeaN_RFD_hi
Vegetables_BlackSeaN_RFD_lo
Vegetables_BlackSeaS_IRR_hi
Vegetables_BlackSeaS_IRR_lo

Vegetables_BlackSeaS_RFD_hi
Vegetables_BlackSeaS_RFD_lo
Vegetables_BoHai_IRR_hi
Vegetables_BoHai_IRR_lo
Vegetables_BoHai_RFD_hi
Vegetables_BoHai_RFD_lo
Vegetables_BorneoCstN_IRR_hi
Vegetables_BorneoCstN_IRR_lo
Vegetables_BorneoCstN_RFD_hi
Vegetables_BorneoCstN_RFD_lo
Vegetables_BrahmaniR_IRR_hi
Vegetables_BrahmaniR_IRR_lo
Vegetables_BrahmaniR_RFD_hi
Vegetables_BrahmaniR_RFD_lo
Vegetables_BrzCstE_IRR_hi
Vegetables_BrzCstE_IRR_lo
Vegetables_BrzCstE_RFD_hi
Vegetables_BrzCstE_RFD_lo
Vegetables_BrzCstN_IRR_hi
Vegetables_BrzCstN_IRR_lo
Vegetables_BrzCstN_RFD_hi
Vegetables_BrzCstN_RFD_lo
Vegetables_BrzCstS_IRR_hi
Vegetables_BrzCstS_IRR_lo
Vegetables_BrzCstS_RFD_hi
Vegetables_BrzCstS_RFD_lo
Vegetables_California_IRR_hi
Vegetables_California_IRR_lo
Vegetables_California_RFD_hi
Vegetables_California_RFD_lo
Vegetables_CanAtl_RFD_hi
Vegetables_CanAtl_RFD_lo
Vegetables_Caribbean_IRR_hi
Vegetables_Caribbean_IRR_lo
Vegetables_Caribbean_RFD_hi
Vegetables_Caribbean_RFD_lo
Vegetables_CaspianE_IRR_hi
Vegetables_CaspianE_IRR_lo
Vegetables_CaspianE_RFD_hi
Vegetables_CaspianE_RFD_lo
Vegetables_CaspianNE_IRR_hi
Vegetables_CaspianNE_IRR_lo
Vegetables_CaspianNE_RFD_hi
Vegetables_CaspianNE_RFD_lo
Vegetables_CaspianSW_IRR_hi
Vegetables_CaspianSW_IRR_lo
Vegetables_CaspianSW_RFD_hi
Vegetables_CaspianSW_RFD_lo
Vegetables_CauveryR_IRR_hi
Vegetables_CauveryR_IRR_lo
Vegetables_CauveryR_RFD_hi
Vegetables_CauveryR_RFD_lo
Vegetables_ChaoPhrR_IRR_hi
Vegetables_ChaoPhrR_IRR_lo
Vegetables_ChaoPhrR_RFD_hi
Vegetables_ChaoPhrR_RFD_lo
Vegetables_ChileCstN_IRR_hi
Vegetables_ChileCstN_IRR_lo
Vegetables_ChileCstS_IRR_hi
Vegetables_ChileCstS_IRR_lo
Vegetables_ChileCstS_RFD_hi
Vegetables_ChileCstS_RFD_lo
Vegetables_ChinaCst_IRR_hi
Vegetables_ChinaCst_IRR_lo
Vegetables_ChinaCst_RFD_hi
Vegetables_ChinaCst_RFD_lo
Vegetables_CntAmer_IRR_hi
Vegetables_CntAmer_IRR_lo
Vegetables_CntAmer_RFD_hi
Vegetables_CntAmer_RFD_lo
Vegetables_ColEcuaCst_IRR_hi
Vegetables_ColEcuaCst_IRR_lo
Vegetables_ColEcuaCst_RFD_hi
Vegetables_ColEcuaCst_RFD_lo
Vegetables_CongoR_IRR_hi
Vegetables_CongoR_IRR_lo
Vegetables_CongoR_RFD_hi
Vegetables_CongoR_RFD_lo
Vegetables_DanubeR_IRR_hi
Vegetables_DanubeR_IRR_lo
Vegetables_DanubeR_RFD_hi
Vegetables_DanubeR_RFD_lo
Vegetables_DaugavaR_IRR_hi
Vegetables_DaugavaR_IRR_lo
Vegetables_DaugavaR_RFD_hi
Vegetables_DaugavaR_RFD_lo
Vegetables_DeadSea_IRR_hi
Vegetables_DeadSea_IRR_lo
Vegetables_DeadSea_RFD_hi
Vegetables_DeadSea_RFD_lo
Vegetables_DnieperR_IRR_hi
Vegetables_DnieperR_IRR_lo
Vegetables_DnieperR_RFD_hi
Vegetables_DnieperR_RFD_lo
Vegetables_DniesterR_IRR_hi
Vegetables_DniesterR_IRR_lo

Vegetables_DniesterR_RFD_hi
Vegetables_DniesterR_RFD_lo
Vegetables_DnkGrmCst_IRR_hi
Vegetables_DnkGrmCst_IRR_lo
Vegetables_DnkGrmCst_RFD_hi
Vegetables_DnkGrmCst_RFD_lo
Vegetables_DonR_IRR_hi
Vegetables_DonR_IRR_lo
Vegetables_DonR_RFD_hi
Vegetables_DonR_RFD_lo
Vegetables_DouroR_IRR_hi
Vegetables_DouroR_IRR_lo
Vegetables_DouroR_RFD_hi
Vegetables_DouroR_RFD_lo
Vegetables_DvinaRN_IRR_hi
Vegetables_DvinaRN_IRR_lo
Vegetables_DvinaRN_RFD_hi
Vegetables_DvinaRN_RFD_lo
Vegetables_EbroR_IRR_hi
Vegetables_EbroR_IRR_lo
Vegetables_EbroR_RFD_hi
Vegetables_EbroR_RFD_lo
Vegetables_EJrdnSyr_IRR_hi
Vegetables_EJrdnSyr_IRR_lo
Vegetables_EJrdnSyr_RFD_hi
Vegetables_EJrdnSyr_RFD_lo
Vegetables_ElbeR_IRR_hi
Vegetables_ElbeR_IRR_lo
Vegetables_ElbeR_RFD_hi
Vegetables_ElbeR_RFD_lo
Vegetables_EmsWeserR_IRR_hi
Vegetables_EmsWeserR_IRR_lo
Vegetables_EmsWeserR_RFD_hi
Vegetables_EmsWeserR_RFD_lo
Vegetables_EngWales_IRR_hi
Vegetables_EngWales_IRR_lo
Vegetables_EngWales_RFD_hi
Vegetables_EngWales_RFD_lo
Vegetables_FarahrudR_IRR_hi
Vegetables_FarahrudR_IRR_lo
Vegetables_Finland_IRR_hi
Vegetables_Finland_IRR_lo
Vegetables_Finland_RFD_hi
Vegetables_Finland_RFD_lo
Vegetables_FlyR_RFD_hi
Vegetables_FlyR_RFD_lo
Vegetables_FranceCstS_IRR_hi
Vegetables_FranceCstS_IRR_lo
Vegetables_FranceCstS_RFD_hi
Vegetables_FranceCstS_RFD_lo
Vegetables_FranceCstW_IRR_hi
Vegetables_FranceCstW_IRR_lo
Vegetables_FranceCstW_RFD_hi
Vegetables_FranceCstW_RFD_lo
Vegetables_FraserR_IRR_hi
Vegetables_FraserR_IRR_lo
Vegetables_FraserR_RFD_hi
Vegetables_FraserR_RFD_lo
Vegetables_GangesR_IRR_hi
Vegetables_GangesR_IRR_lo
Vegetables_GangesR_RFD_hi
Vegetables_GangesR_RFD_lo
Vegetables_Gironde_IRR_hi
Vegetables_Gironde_IRR_lo
Vegetables_Gironde_RFD_hi
Vegetables_Gironde_RFD_lo
Vegetables_Gobi_IRR_hi
Vegetables_Gobi_IRR_lo
Vegetables_Gobi_RFD_hi
Vegetables_Gobi_RFD_lo
Vegetables_GodavariR_IRR_hi
Vegetables_GodavariR_IRR_lo
Vegetables_GodavariR_RFD_hi
Vegetables_GodavariR_RFD_lo
Vegetables_GreatBasin_IRR_hi
Vegetables_GreatBasin_IRR_lo
Vegetables_GreatBasin_RFD_hi
Vegetables_GreatBasin_RFD_lo
Vegetables_GreatLakes_IRR_hi
Vegetables_GreatLakes_IRR_lo
Vegetables_GreatLakes_RFD_hi
Vegetables_GreatLakes_RFD_lo
Vegetables_GrijUsuR_IRR_hi
Vegetables_GrijUsuR_IRR_lo
Vegetables_GrijUsuR_RFD_hi
Vegetables_GrijUsuR_RFD_lo
Vegetables_GuadalqR_IRR_hi
Vegetables_GuadalqR_IRR_lo
Vegetables_GuadalqR_RFD_hi
Vegetables_GuadalqR_RFD_lo
Vegetables_GuadianaR_IRR_hi
Vegetables_GuadianaR_IRR_lo
Vegetables_GuadianaR_RFD_hi
Vegetables_GuadianaR_RFD_lo
Vegetables_GuineaGulf_IRR_hi
Vegetables_GuineaGulf_IRR_lo

Vegetables_GuineaGulf_RFD_hi
Vegetables_GuineaGulf_RFD_lo
Vegetables_Hainan_IRR_hi
Vegetables_Hainan_IRR_lo
Vegetables_Hainan_RFD_hi
Vegetables_Hainan_RFD_lo
Vegetables_HamuMashR_IRR_hi
Vegetables_HamuMashR_IRR_lo
Vegetables_Helmand_IRR_hi
Vegetables_Helmand_IRR_lo
Vegetables_Hong_IRR_hi
Vegetables_Hong_IRR_lo
Vegetables_Hong_RFD_hi
Vegetables_Hong_RFD_lo
Vegetables_HuangHeR_IRR_hi
Vegetables_HuangHeR_IRR_lo
Vegetables_HuangHeR_RFD_hi
Vegetables_HuangHeR_RFD_lo
Vegetables_HudsonBay_RFD_hi
Vegetables_HudsonBay_RFD_lo
Vegetables_IberiaCst_IRR_hi
Vegetables_IberiaCst_IRR_lo
Vegetables_IberiaCst_RFD_hi
Vegetables_IberiaCst_RFD_lo
Vegetables_Iceland_RFD_hi
Vegetables_Iceland_RFD_lo
Vegetables_IdnE_IRR_hi
Vegetables_IdnE_IRR_lo
Vegetables_IdnE_RFD_hi
Vegetables_IdnE_RFD_lo
Vegetables_IndCstE_IRR_hi
Vegetables_IndCstE_IRR_lo
Vegetables_IndCstE_RFD_hi
Vegetables_IndCstE_RFD_lo
Vegetables_IndCstNE_IRR_hi
Vegetables_IndCstNE_IRR_lo
Vegetables_IndCstNE_RFD_hi
Vegetables_IndCstNE_RFD_lo
Vegetables_IndCstS_IRR_hi
Vegetables_IndCstS_IRR_lo
Vegetables_IndCstS_RFD_hi
Vegetables_IndCstS_RFD_lo
Vegetables_IndCstW_IRR_hi
Vegetables_IndCstW_IRR_lo
Vegetables_IndCstW_RFD_hi
Vegetables_IndCstW_RFD_lo
Vegetables_IndusR_IRR_hi
Vegetables_IndusR_IRR_lo
Vegetables_IndusR_RFD_hi
Vegetables_IndusR_RFD_lo
Vegetables_Iran_IRR_hi
Vegetables_Iran_IRR_lo
Vegetables_Ireland_IRR_hi
Vegetables_Ireland_IRR_lo
Vegetables_Ireland_RFD_hi
Vegetables_Ireland_RFD_lo
Vegetables_IrianJaya_IRR_hi
Vegetables_IrianJaya_IRR_lo
Vegetables_IrianJaya_RFD_hi
Vegetables_IrianJaya_RFD_lo
Vegetables_IrrawaddyR_IRR_hi
Vegetables_IrrawaddyR_IRR_lo
Vegetables_IrrawaddyR_RFD_hi
Vegetables_IrrawaddyR_RFD_lo
Vegetables_ItalyCstE_IRR_hi
Vegetables_ItalyCstE_IRR_lo
Vegetables_ItalyCstE_RFD_hi
Vegetables_ItalyCstE_RFD_lo
Vegetables_ItalyCstW_IRR_hi
Vegetables_ItalyCstW_IRR_lo
Vegetables_ItalyCstW_RFD_hi
Vegetables_ItalyCstW_RFD_lo
Vegetables_Japan_IRR_hi
Vegetables_Japan_IRR_lo
Vegetables_Japan_RFD_hi
Vegetables_Japan_RFD_lo
Vegetables_JavaTimor_IRR_hi
Vegetables_JavaTimor_IRR_lo
Vegetables_JavaTimor_RFD_hi
Vegetables_JavaTimor_RFD_lo
Vegetables_Kalimantan_IRR_hi
Vegetables_Kalimantan_IRR_lo
Vegetables_Kalimantan_RFD_hi
Vegetables_Kalimantan_RFD_lo
Vegetables_Korea_IRR_hi
Vegetables_Korea_IRR_lo
Vegetables_Korea_RFD_hi
Vegetables_Korea_RFD_lo
Vegetables_KrishnaR_IRR_hi
Vegetables_KrishnaR_IRR_lo
Vegetables_KrishnaR_RFD_hi
Vegetables_KrishnaR_RFD_lo
Vegetables_LaPuna_IRR_hi
Vegetables_LaPuna_IRR_lo
Vegetables_LaPuna_RFD_hi
Vegetables_LaPuna_RFD_lo

Vegetables_LBalkash_IRR_hi
Vegetables_LBalkash_IRR_lo
Vegetables_LBalkash_RFD_hi
Vegetables_LBalkash_RFD_lo
Vegetables_LChad_IRR_hi
Vegetables_LChad_IRR_lo
Vegetables_LChad_RFD_hi
Vegetables_LChad_RFD_lo
Vegetables_LenaR_IRR_hi
Vegetables_LenaR_IRR_lo
Vegetables_LenaR_RFD_hi
Vegetables_LenaR_RFD_lo
Vegetables_LimpopoR_IRR_hi
Vegetables_LimpopoR_IRR_lo
Vegetables_LimpopoR_RFD_hi
Vegetables_LimpopoR_RFD_lo
Vegetables_LoireR_IRR_hi
Vegetables_LoireR_IRR_lo
Vegetables_LoireR_RFD_hi
Vegetables_LoireR_RFD_lo
Vegetables_Mackenzie_RFD_hi
Vegetables_Mackenzie_RFD_lo
Vegetables_Madagascar_IRR_hi
Vegetables_Madagascar_IRR_lo
Vegetables_Madagascar_RFD_hi
Vegetables_Madagascar_RFD_lo
Vegetables_MagdalenaR_IRR_hi
Vegetables_MagdalenaR_IRR_lo
Vegetables_MagdalenaR_RFD_hi
Vegetables_MagdalenaR_RFD_lo
Vegetables_MahanadiR_IRR_hi
Vegetables_MahanadiR_IRR_lo
Vegetables_MahanadiR_RFD_hi
Vegetables_MahanadiR_RFD_lo
Vegetables_MahiR_IRR_hi
Vegetables_MahiR_IRR_lo
Vegetables_MahiR_RFD_hi
Vegetables_MahiR_RFD_lo
Vegetables_MalaysiaP_IRR_hi
Vegetables_MalaysiaP_IRR_lo
Vegetables_MalaysiaP_RFD_hi
Vegetables_MalaysiaP_RFD_lo
Vegetables_MarChiq_IRR_hi
Vegetables_MarChiq_IRR_lo
Vegetables_MarChiq_RFD_hi
Vegetables_MarChiq_RFD_lo
Vegetables_MeditE_IRR_hi
Vegetables_MeditE_IRR_lo
Vegetables_MeditE_RFD_hi
Vegetables_MeditE_RFD_lo
Vegetables_MeditIsl_IRR_hi
Vegetables_MeditIsl_IRR_lo
Vegetables_MeditIsl_RFD_hi
Vegetables_MeditIsl_RFD_lo
Vegetables_MeditS_IRR_hi
Vegetables_MeditS_IRR_lo
Vegetables_MeditS_RFD_hi
Vegetables_MeditS_RFD_lo
Vegetables_Mekong_IRR_hi
Vegetables_Mekong_IRR_lo
Vegetables_Mekong_RFD_hi
Vegetables_Mekong_RFD_lo
Vegetables_MexBaja_IRR_hi
Vegetables_MexBaja_IRR_lo
Vegetables_MexBaja_RFD_hi
Vegetables_MexBaja_RFD_lo
Vegetables_MexCstNW_IRR_hi
Vegetables_MexCstNW_IRR_lo
Vegetables_MexCstNW_RFD_hi
Vegetables_MexCstNW_RFD_lo
Vegetables_MexCstW_IRR_hi
Vegetables_MexCstW_IRR_lo
Vegetables_MexCstW_RFD_hi
Vegetables_MexCstW_RFD_lo
Vegetables_MexGulf_IRR_hi
Vegetables_MexGulf_IRR_lo
Vegetables_MexGulf_RFD_hi
Vegetables_MexGulf_RFD_lo
Vegetables_MexInt_IRR_hi
Vegetables_MexInt_IRR_lo
Vegetables_MexInt_RFD_hi
Vegetables_MexInt_RFD_lo
Vegetables_MissouriR_IRR_hi
Vegetables_MissouriR_IRR_lo
Vegetables_MissouriR_RFD_hi
Vegetables_MissouriR_RFD_lo
Vegetables_MissppRN_IRR_hi
Vegetables_MissppRN_IRR_lo
Vegetables_MissppRN_RFD_hi
Vegetables_MissppRN_RFD_lo
Vegetables_MissppRS_IRR_hi
Vegetables_MissppRS_IRR_lo
Vegetables_MissppRS_RFD_hi
Vegetables_MissppRS_RFD_lo
Vegetables_MurrayDrlg_IRR_hi
Vegetables_MurrayDrlg_IRR_lo

Vegetables_MurrayDrlg_RFD_hi
Vegetables_MurrayDrlg_RFD_lo
Vegetables_NarmadaR_IRR_hi
Vegetables_NarmadaR_IRR_lo
Vegetables_NarmadaR_RFD_hi
Vegetables_NarmadaR_RFD_lo
Vegetables_NarvaR_IRR_hi
Vegetables_NarvaR_IRR_lo
Vegetables_NarvaR_RFD_hi
Vegetables_NarvaR_RFD_lo
Vegetables_NegroR_IRR_hi
Vegetables_NegroR_IRR_lo
Vegetables_NegroR_RFD_hi
Vegetables_NegroR_RFD_lo
Vegetables_NelsonR_IRR_hi
Vegetables_NelsonR_IRR_lo
Vegetables_NelsonR_RFD_hi
Vegetables_NelsonR_RFD_lo
Vegetables_NemanR_IRR_hi
Vegetables_NemanR_IRR_lo
Vegetables_NemanR_RFD_hi
Vegetables_NemanR_RFD_lo
Vegetables_NevaR_IRR_hi
Vegetables_NevaR_IRR_lo
Vegetables_NevaR_RFD_hi
Vegetables_NevaR_RFD_lo
Vegetables_NewCaledn_RFD_hi
Vegetables_NewCaledn_RFD_lo
Vegetables_NewZealand_IRR_hi
Vegetables_NewZealand_IRR_lo
Vegetables_NewZealand_RFD_hi
Vegetables_NewZealand_RFD_lo
Vegetables_NigerR_IRR_hi
Vegetables_NigerR_IRR_lo
Vegetables_NigerR_RFD_hi
Vegetables_NigerR_RFD_lo
Vegetables_NileR_IRR_hi
Vegetables_NileR_IRR_lo
Vegetables_NileR_RFD_hi
Vegetables_NileR_RFD_lo
Vegetables_NWTerr_RFD_hi
Vegetables_NWTerr_RFD_lo
Vegetables_ObR_IRR_hi
Vegetables_ObR_IRR_lo
Vegetables_ObR_RFD_hi
Vegetables_ObR_RFD_lo
Vegetables_OderR_IRR_hi
Vegetables_OderR_IRR_lo
Vegetables_OderR_RFD_hi
Vegetables_OderR_RFD_lo
Vegetables_OhioR_IRR_hi
Vegetables_OhioR_IRR_lo
Vegetables_OhioR_RFD_hi
Vegetables_OhioR_RFD_lo
Vegetables_OrangeR_IRR_hi
Vegetables_OrangeR_IRR_lo
Vegetables_OrangeR_RFD_hi
Vegetables_OrangeR_RFD_lo
Vegetables_OrinocoR_IRR_hi
Vegetables_OrinocoR_IRR_lo
Vegetables_OrinocoR_RFD_hi
Vegetables_OrinocoR_RFD_lo
Vegetables_PacArctic_IRR_hi
Vegetables_PacArctic_IRR_lo
Vegetables_PacArctic_RFD_hi
Vegetables_PacArctic_RFD_lo
Vegetables_Pampas_IRR_hi
Vegetables_Pampas_IRR_lo
Vegetables_Pampas_RFD_hi
Vegetables_Pampas_RFD_lo
Vegetables_Papaloapan_IRR_hi
Vegetables_Papaloapan_IRR_lo
Vegetables_Papaloapan_RFD_hi
Vegetables_Papaloapan_RFD_lo
Vegetables_PapuaCst_RFD_hi
Vegetables_PapuaCst_RFD_lo
Vegetables_ParnaibaR_IRR_hi
Vegetables_ParnaibaR_IRR_lo
Vegetables_ParnaibaR_RFD_hi
Vegetables_ParnaibaR_RFD_lo
Vegetables_Patagonia_IRR_hi
Vegetables_Patagonia_IRR_lo
Vegetables_Patagonia_RFD_hi
Vegetables_Patagonia_RFD_lo
Vegetables_PennarR_IRR_hi
Vegetables_PennarR_IRR_lo
Vegetables_PennarR_RFD_hi
Vegetables_PennarR_RFD_lo
Vegetables_PersianGulf_IRR_hi
Vegetables_PersianGulf_IRR_lo
Vegetables_PeruCst_IRR_hi
Vegetables_PeruCst_IRR_lo
Vegetables_PeruCst_RFD_hi
Vegetables_PeruCst_RFD_lo
Vegetables_Phlppns_IRR_hi
Vegetables_Phlppns_IRR_lo

Vegetables_Phlppns_RFD_hi
Vegetables_Phlppns_RFD_lo
Vegetables_PolandCst_IRR_hi
Vegetables_PolandCst_IRR_lo
Vegetables_PolandCst_RFD_hi
Vegetables_PolandCst_RFD_lo
Vegetables_PoR_IRR_hi
Vegetables_PoR_IRR_lo
Vegetables_PoR_RFD_hi
Vegetables_PoR_RFD_lo
Vegetables_RedSeaE_IRR_hi
Vegetables_RedSeaE_IRR_lo
Vegetables_RedSeaE_RFD_hi
Vegetables_RedSeaE_RFD_lo
Vegetables_RhineR_IRR_hi
Vegetables_RhineR_IRR_lo
Vegetables_RhineR_RFD_hi
Vegetables_RhineR_RFD_lo
Vegetables_RhoneR_IRR_hi
Vegetables_RhoneR_IRR_lo
Vegetables_RhoneR_RFD_hi
Vegetables_RhoneR_RFD_lo
Vegetables_RiftValley_IRR_hi
Vegetables_RiftValley_IRR_lo
Vegetables_RiftValley_RFD_hi
Vegetables_RiftValley_RFD_lo
Vegetables_RioBalsas_IRR_hi
Vegetables_RioBalsas_IRR_lo
Vegetables_RioBalsas_RFD_hi
Vegetables_RioBalsas_RFD_lo
Vegetables_RioGrande_IRR_hi
Vegetables_RioGrande_IRR_lo
Vegetables_RioGrande_RFD_hi
Vegetables_RioGrande_RFD_lo
Vegetables_RioLaPlata_IRR_hi
Vegetables_RioLaPlata_IRR_lo
Vegetables_RioLaPlata_RFD_hi
Vegetables_RioLaPlata_RFD_lo
Vegetables_RioLerma_IRR_hi
Vegetables_RioLerma_IRR_lo
Vegetables_RioLerma_RFD_hi
Vegetables_RioLerma_RFD_lo
Vegetables_RioVerde_IRR_hi
Vegetables_RioVerde_IRR_lo
Vegetables_RioVerde_RFD_hi
Vegetables_RioVerde_RFD_lo
Vegetables_RusCstSE_IRR_hi
Vegetables_RusCstSE_IRR_lo
Vegetables_RusCstSE_RFD_hi
Vegetables_RusCstSE_RFD_lo
Vegetables_SabarmatiR_IRR_hi
Vegetables_SabarmatiR_IRR_lo
Vegetables_SabarmatiR_RFD_hi
Vegetables_SabarmatiR_RFD_lo
Vegetables_Salinas_IRR_hi
Vegetables_Salinas_IRR_lo
Vegetables_Salinas_RFD_hi
Vegetables_Salinas_RFD_lo
Vegetables_Salween_IRR_hi
Vegetables_Salween_IRR_lo
Vegetables_Salween_RFD_hi
Vegetables_Salween_RFD_lo
Vegetables_SAmerCstN_IRR_hi
Vegetables_SAmerCstN_IRR_lo
Vegetables_SAmerCstN_RFD_hi
Vegetables_SAmerCstN_RFD_lo
Vegetables_SAmerCstNE_IRR_hi
Vegetables_SAmerCstNE_IRR_lo
Vegetables_SAmerCstNE_RFD_hi
Vegetables_SAmerCstNE_RFD_lo
Vegetables_SaoFrancR_IRR_hi
Vegetables_SaoFrancR_IRR_lo
Vegetables_SaoFrancR_RFD_hi
Vegetables_SaoFrancR_RFD_lo
Vegetables_ScheldtR_IRR_hi
Vegetables_ScheldtR_IRR_lo
Vegetables_ScheldtR_RFD_hi
Vegetables_ScheldtR_RFD_lo
Vegetables_SChinaSea_IRR_hi
Vegetables_SChinaSea_IRR_lo
Vegetables_SChinaSea_RFD_hi
Vegetables_SChinaSea_RFD_lo
Vegetables_ScndnvN_IRR_hi
Vegetables_ScndnvN_IRR_lo
Vegetables_ScndnvN_RFD_hi
Vegetables_ScndnvN_RFD_lo
Vegetables_Scotland_IRR_hi
Vegetables_Scotland_IRR_lo
Vegetables_Scotland_RFD_hi
Vegetables_Scotland_RFD_lo
Vegetables_SeineR_IRR_hi
Vegetables_SeineR_IRR_lo
Vegetables_SeineR_RFD_hi
Vegetables_SeineR_RFD_lo
Vegetables_SenegalR_IRR_hi
Vegetables_SenegalR_IRR_lo

Vegetables_SenegalR_RFD_hi
Vegetables_SenegalR_RFD_lo
Vegetables_SepikR_RFD_hi
Vegetables_SepikR_RFD_lo
Vegetables_ShebJubR_IRR_hi
Vegetables_ShebJubR_IRR_lo
Vegetables_ShebJubR_RFD_hi
Vegetables_ShebJubR_RFD_lo
Vegetables_SiberiaW_IRR_hi
Vegetables_SiberiaW_IRR_lo
Vegetables_SiberiaW_RFD_hi
Vegetables_SiberiaW_RFD_lo
Vegetables_SinaiP_IRR_hi
Vegetables_SinaiP_IRR_lo
Vegetables_SinaiP_RFD_hi
Vegetables_SinaiP_RFD_lo
Vegetables_SittaungR_IRR_hi
Vegetables_SittaungR_IRR_lo
Vegetables_SittaungR_RFD_hi
Vegetables_SittaungR_RFD_lo
Vegetables_SolomonIsl_RFD_hi
Vegetables_SolomonIsl_RFD_lo
Vegetables_SpainCstSE_IRR_hi
Vegetables_SpainCstSE_IRR_lo
Vegetables_SpainCstSE_RFD_hi
Vegetables_SpainCstSE_RFD_lo
Vegetables_SriLanka_IRR_hi
Vegetables_SriLanka_IRR_lo
Vegetables_SriLanka_RFD_hi
Vegetables_SriLanka_RFD_lo
Vegetables_StLwrncR_IRR_hi
Vegetables_StLwrncR_IRR_lo
Vegetables_StLwrncR_RFD_hi
Vegetables_StLwrncR_RFD_lo
Vegetables_Sulawesi_IRR_hi
Vegetables_Sulawesi_IRR_lo
Vegetables_Sulawesi_RFD_hi
Vegetables_Sulawesi_RFD_lo
Vegetables_Sumatra_IRR_hi
Vegetables_Sumatra_IRR_lo
Vegetables_Sumatra_RFD_hi
Vegetables_Sumatra_RFD_lo
Vegetables_Sweden_IRR_hi
Vegetables_Sweden_IRR_lo
Vegetables_Sweden_RFD_hi
Vegetables_Sweden_RFD_lo
Vegetables_SyrDaryaR_IRR_hi
Vegetables_SyrDaryaR_IRR_lo
Vegetables_SyrDaryaR_RFD_hi
Vegetables_SyrDaryaR_RFD_lo
Vegetables_TagusR_IRR_hi
Vegetables_TagusR_IRR_lo
Vegetables_TagusR_RFD_hi
Vegetables_TagusR_RFD_lo
Vegetables_Taiwan_IRR_hi
Vegetables_Taiwan_IRR_lo
Vegetables_Taiwan_RFD_hi
Vegetables_Taiwan_RFD_lo
Vegetables_TaptiR_IRR_hi
Vegetables_TaptiR_IRR_lo
Vegetables_TaptiR_RFD_hi
Vegetables_TaptiR_RFD_lo
Vegetables_Tarim_IRR_hi
Vegetables_Tarim_IRR_lo
Vegetables_Tarim_RFD_hi
Vegetables_Tarim_RFD_lo
Vegetables_Tasmania_IRR_hi
Vegetables_Tasmania_IRR_lo
Vegetables_Tasmania_RFD_hi
Vegetables_Tasmania_RFD_lo
Vegetables_Tehuantpc_IRR_hi
Vegetables_Tehuantpc_IRR_lo
Vegetables_Tehuantpc_RFD_hi
Vegetables_Tehuantpc_RFD_lo
Vegetables_TennR_IRR_hi
Vegetables_TennR_IRR_lo
Vegetables_TennR_RFD_hi
Vegetables_TennR_RFD_lo
Vegetables_TexasCst_IRR_hi
Vegetables_TexasCst_IRR_lo
Vegetables_TexasCst_RFD_hi
Vegetables_TexasCst_RFD_lo
Vegetables_ThaiGulf_IRR_hi
Vegetables_ThaiGulf_IRR_lo
Vegetables_ThaiGulf_RFD_hi
Vegetables_ThaiGulf_RFD_lo
Vegetables_TiberR_IRR_hi
Vegetables_TiberR_IRR_lo
Vegetables_TiberR_RFD_hi
Vegetables_TiberR_RFD_lo
Vegetables_TigrEuphR_IRR_hi
Vegetables_TigrEuphR_IRR_lo
Vegetables_TigrEuphR_RFD_hi
Vegetables_TigrEuphR_RFD_lo
Vegetables_TocantinsR_IRR_hi
Vegetables_TocantinsR_IRR_lo

Vegetables_TocantinsR_RFD_hi
Vegetables_TocantinsR_RFD_lo
Vegetables_UralR_IRR_hi
Vegetables_UralR_IRR_lo
Vegetables_UralR_RFD_hi
Vegetables_UralR_RFD_lo
Vegetables_UsaColoRN_IRR_hi
Vegetables_UsaColoRN_IRR_lo
Vegetables_UsaColoRN_RFD_hi
Vegetables_UsaColoRN_RFD_lo
Vegetables_UsaColoRS_IRR_hi
Vegetables_UsaColoRS_IRR_lo
Vegetables_UsaColoRS_RFD_hi
Vegetables_UsaColoRS_RFD_lo
Vegetables_UsaCstE_IRR_hi
Vegetables_UsaCstE_IRR_lo
Vegetables_UsaCstE_RFD_hi
Vegetables_UsaCstE_RFD_lo
Vegetables_UsaCstNE_IRR_hi
Vegetables_UsaCstNE_IRR_lo
Vegetables_UsaCstNE_RFD_hi
Vegetables_UsaCstNE_RFD_lo
Vegetables_UsaCstSE_IRR_hi
Vegetables_UsaCstSE_IRR_lo
Vegetables_UsaCstSE_RFD_hi
Vegetables_UsaCstSE_RFD_lo
Vegetables_UsaPacNW_IRR_hi
Vegetables_UsaPacNW_IRR_lo
Vegetables_UsaPacNW_RFD_hi
Vegetables_UsaPacNW_RFD_lo
Vegetables_VietnamCst_IRR_hi
Vegetables_VietnamCst_IRR_lo
Vegetables_VietnamCst_RFD_hi
Vegetables_VietnamCst_RFD_lo
Vegetables_VolgaR_IRR_hi
Vegetables_VolgaR_IRR_lo
Vegetables_VolgaR_RFD_hi
Vegetables_VolgaR_RFD_lo
Vegetables_VoltaR_IRR_hi
Vegetables_VoltaR_IRR_lo
Vegetables_VoltaR_RFD_hi
Vegetables_VoltaR_RFD_lo
Vegetables_WislaR_IRR_hi
Vegetables_WislaR_IRR_lo
Vegetables_WislaR_RFD_hi
Vegetables_WislaR_RFD_lo
Vegetables_XunJiang_IRR_hi
Vegetables_XunJiang_IRR_lo
Vegetables_XunJiang_RFD_hi
Vegetables_XunJiang_RFD_lo
Vegetables_Yangtze_IRR_hi
Vegetables_Yangtze_IRR_lo
Vegetables_Yangtze_RFD_hi
Vegetables_Yangtze_RFD_lo
Vegetables_YeniseiR_IRR_hi
Vegetables_YeniseiR_IRR_lo
Vegetables_YeniseiR_RFD_hi
Vegetables_YeniseiR_RFD_lo
Vegetables_YucatanP_IRR_hi
Vegetables_YucatanP_IRR_lo
Vegetables_YucatanP_RFD_hi
Vegetables_YucatanP_RFD_lo
Vegetables_ZambeziR_IRR_hi
Vegetables_ZambeziR_IRR_lo
Vegetables_ZambeziR_RFD_hi
Vegetables_ZambeziR_RFD_lo
Vegetables_ZiyaHe_IRR_hi
Vegetables_ZiyaHe_IRR_lo
Vegetables_ZiyaHe_RFD_hi
Vegetables_ZiyaHe_RFD_lo
waste_incineration
wastewater
Wheat_AdrBlkSea_IRR_hi
Wheat_AdrBlkSea_IRR_lo
Wheat_AdrBlkSea_RFD_hi
Wheat_AdrBlkSea_RFD_lo
Wheat_AfrCstE_RFD_hi
Wheat_AfrCstE_RFD_lo
Wheat_AfrCstNE_IRR_hi
Wheat_AfrCstNE_IRR_lo
Wheat_AfrCstNE_RFD_hi
Wheat_AfrCstNE_RFD_lo
Wheat_AfrCstNW_IRR_hi
Wheat_AfrCstNW_IRR_lo
Wheat_AfrCstNW_RFD_hi
Wheat_AfrCstNW_RFD_lo
Wheat_AfrCstS_IRR_hi
Wheat_AfrCstS_IRR_lo
Wheat_AfrCstS_RFD_hi
Wheat_AfrCstS_RFD_lo
Wheat_AfrCstSE_IRR_hi
Wheat_AfrCstSE_IRR_lo
Wheat_AfrCstSE_RFD_hi
Wheat_AfrCstSE_RFD_lo
Wheat_AfrCstSSW_IRR_hi
Wheat_AfrCstSSW_IRR_lo

Wheat_AfrCstSSW_RFD_hi
Wheat_AfrCstSSW_RFD_lo
Wheat_AfrCstSW_IRR_hi
Wheat_AfrCstSW_IRR_lo
Wheat_AfrCstW_IRR_hi
Wheat_AfrCstW_IRR_lo
Wheat_AfrCstW_RFD_hi
Wheat_AfrCstW_RFD_lo
Wheat_AfrIntN_IRR_hi
Wheat_AfrIntN_IRR_lo
Wheat_AfrIntN_RFD_hi
Wheat_AfrIntN_RFD_lo
Wheat_AfrIntS_IRR_hi
Wheat_AfrIntS_IRR_lo
Wheat_AfrIntS_RFD_hi
Wheat_AfrIntS_RFD_lo
Wheat_AmazonR_IRR_hi
Wheat_AmazonR_IRR_lo
Wheat_AmazonR_RFD_hi
Wheat_AmazonR_RFD_lo
Wheat_AmuDaryaR_IRR_hi
Wheat_AmuDaryaR_IRR_lo
Wheat_AmuDaryaR_RFD_hi
Wheat_AmuDaryaR_RFD_lo
Wheat_AmurR_IRR_hi
Wheat_AmurR_IRR_lo
Wheat_AmurR_RFD_hi
Wheat_AmurR_RFD_lo
Wheat_AngolaCst_RFD_hi
Wheat_AngolaCst_RFD_lo
Wheat_ArabianP_IRR_hi
Wheat_ArabianP_IRR_lo
Wheat_ArabianP_RFD_hi
Wheat_ArabianP_RFD_lo
Wheat_ArabianSea_IRR_hi
Wheat_ArabianSea_IRR_lo
Wheat_ArabianSea_RFD_hi
Wheat_ArabianSea_RFD_lo
Wheat_ArgColoR_IRR_hi
Wheat_ArgColoR_IRR_lo
Wheat_ArgColoR_RFD_hi
Wheat_ArgColoR_RFD_lo
Wheat_ArgCstN_IRR_hi
Wheat_ArgCstN_IRR_lo
Wheat_ArgCstN_RFD_hi
Wheat_ArgCstN_RFD_lo
Wheat_ArgCstS_IRR_hi
Wheat_ArgCstS_IRR_lo
Wheat_ArgCstS_RFD_hi
Wheat_ArgCstS_RFD_lo
Wheat_ArkWhtRedR_IRR_hi
Wheat_ArkWhtRedR_IRR_lo
Wheat_ArkWhtRedR_RFD_hi
Wheat_ArkWhtRedR_RFD_lo
Wheat_AusCstE_IRR_hi
Wheat_AusCstE_IRR_lo
Wheat_AusCstE_RFD_hi
Wheat_AusCstE_RFD_lo
Wheat_AusCstN_IRR_hi
Wheat_AusCstN_IRR_lo
Wheat_AusCstN_RFD_hi
Wheat_AusCstN_RFD_lo
Wheat_AusCstS_IRR_hi
Wheat_AusCstS_IRR_lo
Wheat_AusCstS_RFD_hi
Wheat_AusCstS_RFD_lo
Wheat_AusCstW_IRR_hi
Wheat_AusCstW_IRR_lo
Wheat_AusCstW_RFD_hi
Wheat_AusCstW_RFD_lo
Wheat_AusInt_IRR_hi
Wheat_AusInt_IRR_lo
Wheat_AusInt_RFD_hi
Wheat_AusInt_RFD_lo
Wheat_BalticSea_IRR_hi
Wheat_BalticSea_IRR_lo
Wheat_BalticSea_RFD_hi
Wheat_BalticSea_RFD_lo
Wheat_BarentsSea_IRR_hi
Wheat_BarentsSea_IRR_lo
Wheat_BarentsSea_RFD_hi
Wheat_BarentsSea_RFD_lo
Wheat_BengalBay_IRR_hi
Wheat_BengalBay_IRR_lo
Wheat_BengalBay_RFD_hi
Wheat_BengalBay_RFD_lo
Wheat_BengalW_IRR_hi
Wheat_BengalW_IRR_lo
Wheat_BengalW_RFD_hi
Wheat_BengalW_RFD_lo
Wheat_BlackSeaN_IRR_hi
Wheat_BlackSeaN_IRR_lo
Wheat_BlackSeaN_RFD_hi
Wheat_BlackSeaN_RFD_lo
Wheat_BlackSeaS_IRR_hi
Wheat_BlackSeaS_IRR_lo

Wheat_BlackSeaS_RFD_hi
Wheat_BlackSeaS_RFD_lo
Wheat_BoHai_IRR_hi
Wheat_BoHai_IRR_lo
Wheat_BoHai_RFD_hi
Wheat_BoHai_RFD_lo
Wheat_BrahmaniR_IRR_hi
Wheat_BrahmaniR_IRR_lo
Wheat_BrahmaniR_RFD_hi
Wheat_BrahmaniR_RFD_lo
Wheat_BrzCstS_IRR_hi
Wheat_BrzCstS_IRR_lo
Wheat_BrzCstS_RFD_hi
Wheat_BrzCstS_RFD_lo
Wheat_California_IRR_hi
Wheat_California_IRR_lo
Wheat_California_RFD_hi
Wheat_California_RFD_lo
Wheat_CanAtl_IRR_hi
Wheat_CanAtl_IRR_lo
Wheat_CanAtl_RFD_hi
Wheat_CanAtl_RFD_lo
Wheat_CaspianE_IRR_hi
Wheat_CaspianE_IRR_lo
Wheat_CaspianE_RFD_hi
Wheat_CaspianE_RFD_lo
Wheat_CaspianNE_IRR_hi
Wheat_CaspianNE_IRR_lo
Wheat_CaspianNE_RFD_hi
Wheat_CaspianNE_RFD_lo
Wheat_CaspianSW_IRR_hi
Wheat_CaspianSW_IRR_lo
Wheat_CaspianSW_RFD_hi
Wheat_CaspianSW_RFD_lo
Wheat_CauveryR_IRR_hi
Wheat_CauveryR_IRR_lo
Wheat_CauveryR_RFD_hi
Wheat_CauveryR_RFD_lo
Wheat_ChaoPhrR_RFD_hi
Wheat_ChaoPhrR_RFD_lo
Wheat_ChileCstN_IRR_hi
Wheat_ChileCstN_IRR_lo
Wheat_ChileCstN_RFD_hi
Wheat_ChileCstN_RFD_lo
Wheat_ChileCstS_IRR_hi
Wheat_ChileCstS_IRR_lo
Wheat_ChileCstS_RFD_hi
Wheat_ChileCstS_RFD_lo
Wheat_ChinaCst_IRR_hi
Wheat_ChinaCst_IRR_lo
Wheat_ChinaCst_RFD_hi
Wheat_ChinaCst_RFD_lo
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Wheat_CntAmer_RFD_lo
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Wheat_ColEcuaCst_IRR_lo
Wheat_ColEcuaCst_RFD_hi
Wheat_ColEcuaCst_RFD_lo
Wheat_CongoR_IRR_hi
Wheat_CongoR_IRR_lo
Wheat_CongoR_RFD_hi
Wheat_CongoR_RFD_lo
Wheat_DanubeR_IRR_hi
Wheat_DanubeR_IRR_lo
Wheat_DanubeR_RFD_hi
Wheat_DanubeR_RFD_lo
Wheat_DaugavaR_IRR_hi
Wheat_DaugavaR_IRR_lo
Wheat_DaugavaR_RFD_hi
Wheat_DaugavaR_RFD_lo
Wheat_DeadSea_IRR_hi
Wheat_DeadSea_IRR_lo
Wheat_DeadSea_RFD_hi
Wheat_DeadSea_RFD_lo
Wheat_DnieperR_IRR_hi
Wheat_DnieperR_IRR_lo
Wheat_DnieperR_RFD_hi
Wheat_DnieperR_RFD_lo
Wheat_DniesterR_IRR_hi
Wheat_DniesterR_IRR_lo
Wheat_DniesterR_RFD_hi
Wheat_DniesterR_RFD_lo
Wheat_DnkGrmCst_IRR_hi
Wheat_DnkGrmCst_IRR_lo
Wheat_DnkGrmCst_RFD_hi
Wheat_DnkGrmCst_RFD_lo
Wheat_DonR_IRR_hi
Wheat_DonR_IRR_lo
Wheat_DonR_RFD_hi
Wheat_DonR_RFD_lo
Wheat_DouroR_IRR_hi
Wheat_DouroR_IRR_lo
Wheat_DouroR_RFD_hi
Wheat_DouroR_RFD_lo

Wheat_DvinaRN_IRR_hi
Wheat_DvinaRN_IRR_lo
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Wheat_DvinaRN_RFD_lo
Wheat_EbroR_IRR_hi
Wheat_EbroR_IRR_lo
Wheat_EbroR_RFD_hi
Wheat_EbroR_RFD_lo
Wheat_EJrdnSyr_IRR_hi
Wheat_EJrdnSyr_IRR_lo
Wheat_EJrdnSyr_RFD_hi
Wheat_EJrdnSyr_RFD_lo
Wheat_ElbeR_IRR_hi
Wheat_ElbeR_IRR_lo
Wheat_ElbeR_RFD_hi
Wheat_ElbeR_RFD_lo
Wheat_EmsWeserR_RFD_hi
Wheat_EmsWeserR_RFD_lo
Wheat_EngWales_IRR_hi
Wheat_EngWales_IRR_lo
Wheat_EngWales_RFD_hi
Wheat_EngWales_RFD_lo
Wheat_FarahrudR_IRR_hi
Wheat_FarahrudR_IRR_lo
Wheat_FarahrudR_RFD_hi
Wheat_FarahrudR_RFD_lo
Wheat_Finland_RFD_hi
Wheat_Finland_RFD_lo
Wheat_FranceCstS_IRR_hi
Wheat_FranceCstS_IRR_lo
Wheat_FranceCstS_RFD_hi
Wheat_FranceCstS_RFD_lo
Wheat_FranceCstW_IRR_hi
Wheat_FranceCstW_IRR_lo
Wheat_FranceCstW_RFD_hi
Wheat_FranceCstW_RFD_lo
Wheat_FraserR_IRR_hi
Wheat_FraserR_IRR_lo
Wheat_FraserR_RFD_hi
Wheat_FraserR_RFD_lo
Wheat_GangesR_IRR_hi
Wheat_GangesR_IRR_lo
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Wheat_GangesR_RFD_lo
Wheat_Gironde_IRR_hi
Wheat_Gironde_IRR_lo
Wheat_Gironde_RFD_hi
Wheat_Gironde_RFD_lo
Wheat_Gobi_IRR_hi
Wheat_Gobi_IRR_lo
Wheat_Gobi_RFD_hi
Wheat_Gobi_RFD_lo
Wheat_GodavariR_IRR_hi
Wheat_GodavariR_IRR_lo
Wheat_GodavariR_RFD_hi
Wheat_GodavariR_RFD_lo
Wheat_GreatBasin_IRR_hi
Wheat_GreatBasin_IRR_lo
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Wheat_GreatBasin_RFD_lo
Wheat_GreatLakes_IRR_hi
Wheat_GreatLakes_IRR_lo
Wheat_GreatLakes_RFD_hi
Wheat_GreatLakes_RFD_lo
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Wheat_GrijUsuR_IRR_lo
Wheat_GrijUsuR_RFD_hi
Wheat_GrijUsuR_RFD_lo
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Wheat_GuadalqR_IRR_lo
Wheat_GuadalqR_RFD_hi
Wheat_GuadalqR_RFD_lo
Wheat_GuadianaR_IRR_hi
Wheat_GuadianaR_IRR_lo
Wheat_GuadianaR_RFD_hi
Wheat_GuadianaR_RFD_lo
Wheat_GuineaGulf_IRR_hi
Wheat_GuineaGulf_IRR_lo
Wheat_GuineaGulf_RFD_hi
Wheat_GuineaGulf_RFD_lo
Wheat_HamuMashR_IRR_hi
Wheat_HamuMashR_IRR_lo
Wheat_HamuMashR_RFD_hi
Wheat_HamuMashR_RFD_lo
Wheat_Helmand_IRR_hi
Wheat_Helmand_IRR_lo
Wheat_Helmand_RFD_hi
Wheat_Helmand_RFD_lo
Wheat_Hong_IRR_hi
Wheat_Hong_IRR_lo
Wheat_Hong_RFD_hi
Wheat_Hong_RFD_lo
Wheat_HuangHeR_IRR_hi
Wheat_HuangHeR_IRR_lo
Wheat_HuangHeR_RFD_hi
Wheat_HuangHeR_RFD_lo

Wheat_HudsonBay_RFD_hi
Wheat_HudsonBay_RFD_lo
Wheat_IberiaCst_IRR_hi
Wheat_IberiaCst_IRR_lo
Wheat_IberiaCst_RFD_hi
Wheat_IberiaCst_RFD_lo
Wheat_IndCstE_IRR_hi
Wheat_IndCstE_IRR_lo
Wheat_IndCstNE_IRR_hi
Wheat_IndCstNE_IRR_lo
Wheat_IndCstNE_RFD_hi
Wheat_IndCstNE_RFD_lo
Wheat_IndCstS_RFD_hi
Wheat_IndCstS_RFD_lo
Wheat_IndCstW_IRR_hi
Wheat_IndCstW_IRR_lo
Wheat_IndCstW_RFD_hi
Wheat_IndCstW_RFD_lo
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Wheat_IndusR_IRR_lo
Wheat_IndusR_RFD_hi
Wheat_IndusR_RFD_lo
Wheat_Iran_IRR_hi
Wheat_Iran_IRR_lo
Wheat_Iran_RFD_hi
Wheat_Iran_RFD_lo
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Wheat_Ireland_IRR_lo
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Wheat_Ireland_RFD_lo
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Wheat_IrrawaddyR_IRR_lo
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Wheat_IrrawaddyR_RFD_lo
Wheat_ItalyCstE_IRR_hi
Wheat_ItalyCstE_IRR_lo
Wheat_ItalyCstE_RFD_hi
Wheat_ItalyCstE_RFD_lo
Wheat_ItalyCstW_IRR_hi
Wheat_ItalyCstW_IRR_lo
Wheat_ItalyCstW_RFD_hi
Wheat_ItalyCstW_RFD_lo
Wheat_Japan_IRR_hi
Wheat_Japan_IRR_lo
Wheat_Japan_RFD_hi
Wheat_Japan_RFD_lo
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Wheat_Korea_RFD_lo
Wheat_KrishnaR_IRR_hi
Wheat_KrishnaR_IRR_lo
Wheat_KrishnaR_RFD_hi
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Wheat_LBalkash_IRR_lo
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Wheat_LChad_IRR_hi
Wheat_LChad_IRR_lo
Wheat_LChad_RFD_hi
Wheat_LChad_RFD_lo
Wheat_LenaR_RFD_hi
Wheat_LenaR_RFD_lo
Wheat_LimpopoR_IRR_hi
Wheat_LimpopoR_IRR_lo
Wheat_LimpopoR_RFD_hi
Wheat_LimpopoR_RFD_lo
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Wheat_LoireR_IRR_lo
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Wheat_LoireR_RFD_lo
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Wheat_Mackenzie_RFD_lo
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Wheat_Madagascar_RFD_lo
Wheat_MagdalenaR_RFD_hi
Wheat_MagdalenaR_RFD_lo
Wheat_MahanadiR_IRR_hi
Wheat_MahanadiR_IRR_lo
Wheat_MahanadiR_RFD_hi
Wheat_MahanadiR_RFD_lo
Wheat_MahiR_IRR_hi
Wheat_MahiR_IRR_lo
Wheat_MahiR_RFD_hi
Wheat_MahiR_RFD_lo
Wheat_MalaysiaP_IRR_hi
Wheat_MalaysiaP_IRR_lo
Wheat_MalaysiaP_RFD_hi
Wheat_MalaysiaP_RFD_lo
Wheat_MarChiq_IRR_hi
Wheat_MarChiq_IRR_lo

Wheat_MarChiq_RFD_hi
Wheat_MarChiq_RFD_lo
Wheat_MeditE_IRR_hi
Wheat_MeditE_IRR_lo
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Wheat_MeditIsl_IRR_hi
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Wheat_MeditIsl_RFD_lo
Wheat_MeditS_IRR_hi
Wheat_MeditS_IRR_lo
Wheat_MeditS_RFD_hi
Wheat_MeditS_RFD_lo
Wheat_Mekong_IRR_hi
Wheat_Mekong_IRR_lo
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Wheat_Mekong_RFD_lo
Wheat_MexBaja_IRR_hi
Wheat_MexBaja_IRR_lo
Wheat_MexCstNW_IRR_hi
Wheat_MexCstNW_IRR_lo
Wheat_MexCstNW_RFD_hi
Wheat_MexCstNW_RFD_lo
Wheat_MexCstW_IRR_hi
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Wheat_MexGulf_IRR_lo
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Wheat_MexInt_IRR_lo
Wheat_MissouriR_IRR_hi
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Wheat_MissppRN_IRR_lo
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Wheat_MissppRS_IRR_hi
Wheat_MissppRS_IRR_lo
Wheat_MissppRS_RFD_hi
Wheat_MissppRS_RFD_lo
Wheat_MurrayDrlg_IRR_hi
Wheat_MurrayDrlg_IRR_lo
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Wheat_MurrayDrlg_RFD_lo
Wheat_NarmadaR_IRR_hi
Wheat_NarmadaR_IRR_lo
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Wheat_NarmadaR_RFD_lo
Wheat_NarvaR_IRR_hi
Wheat_NarvaR_IRR_lo
Wheat_NarvaR_RFD_hi
Wheat_NarvaR_RFD_lo
Wheat_NegroR_IRR_hi
Wheat_NegroR_IRR_lo
Wheat_NegroR_RFD_hi
Wheat_NegroR_RFD_lo
Wheat_NelsonR_IRR_hi
Wheat_NelsonR_IRR_lo
Wheat_NelsonR_RFD_hi
Wheat_NelsonR_RFD_lo
Wheat_NemanR_IRR_hi
Wheat_NemanR_IRR_lo
Wheat_NemanR_RFD_hi
Wheat_NemanR_RFD_lo
Wheat_NevaR_IRR_hi
Wheat_NevaR_IRR_lo
Wheat_NevaR_RFD_hi
Wheat_NevaR_RFD_lo
Wheat_NewCaledn_RFD_hi
Wheat_NewCaledn_RFD_lo
Wheat_NewZealand_RFD_hi
Wheat_NewZealand_RFD_lo
Wheat_NigerR_IRR_hi
Wheat_NigerR_IRR_lo
Wheat_NigerR_RFD_hi
Wheat_NigerR_RFD_lo
Wheat_NileR_IRR_hi
Wheat_NileR_IRR_lo
Wheat_NileR_RFD_hi
Wheat_NileR_RFD_lo
Wheat_NWTerr_IRR_hi
Wheat_NWTerr_IRR_lo
Wheat_NWTerr_RFD_hi
Wheat_NWTerr_RFD_lo
Wheat_ObR_IRR_hi
Wheat_ObR_IRR_lo
Wheat_ObR_RFD_hi
Wheat_ObR_RFD_lo
Wheat_OderR_IRR_hi
Wheat_OderR_IRR_lo
Wheat_OderR_RFD_hi
Wheat_OderR_RFD_lo
Wheat_OhioR_IRR_hi
Wheat_OhioR_IRR_lo

Wheat_OhioR_RFD_hi
Wheat_OhioR_RFD_lo
Wheat_OrangeR_IRR_hi
Wheat_OrangeR_IRR_lo
Wheat_OrangeR_RFD_hi
Wheat_OrangeR_RFD_lo
Wheat_OrinocoR_RFD_hi
Wheat_OrinocoR_RFD_lo
Wheat_Pampas_IRR_hi
Wheat_Pampas_IRR_lo
Wheat_Pampas_RFD_hi
Wheat_Pampas_RFD_lo
Wheat_Papaloapan_IRR_hi
Wheat_Papaloapan_IRR_lo
Wheat_PennarR_IRR_hi
Wheat_PennarR_IRR_lo
Wheat_PennarR_RFD_hi
Wheat_PennarR_RFD_lo
Wheat_PersianGulf_IRR_hi
Wheat_PersianGulf_IRR_lo
Wheat_PersianGulf_RFD_hi
Wheat_PersianGulf_RFD_lo
Wheat_PeruCst_IRR_hi
Wheat_PeruCst_IRR_lo
Wheat_PeruCst_RFD_hi
Wheat_PeruCst_RFD_lo
Wheat_PolandCst_IRR_hi
Wheat_PolandCst_IRR_lo
Wheat_PolandCst_RFD_hi
Wheat_PolandCst_RFD_lo
Wheat_PoR_IRR_hi
Wheat_PoR_IRR_lo
Wheat_PoR_RFD_hi
Wheat_PoR_RFD_lo
Wheat_RedSeaE_IRR_hi
Wheat_RedSeaE_IRR_lo
Wheat_RedSeaE_RFD_hi
Wheat_RedSeaE_RFD_lo
Wheat_RhineR_IRR_hi
Wheat_RhineR_IRR_lo
Wheat_RhineR_RFD_hi
Wheat_RhineR_RFD_lo
Wheat_RhoneR_IRR_hi
Wheat_RhoneR_IRR_lo
Wheat_RhoneR_RFD_hi
Wheat_RhoneR_RFD_lo
Wheat_RiftValley_IRR_hi
Wheat_RiftValley_IRR_lo
Wheat_RiftValley_RFD_hi
Wheat_RiftValley_RFD_lo
Wheat_RioBalsas_IRR_hi
Wheat_RioBalsas_IRR_lo
Wheat_RioGrande_IRR_hi
Wheat_RioGrande_IRR_lo
Wheat_RioGrande_RFD_hi
Wheat_RioGrande_RFD_lo
Wheat_RioLaPlata_IRR_hi
Wheat_RioLaPlata_IRR_lo
Wheat_RioLaPlata_RFD_hi
Wheat_RioLaPlata_RFD_lo
Wheat_RioLerma_IRR_hi
Wheat_RioLerma_IRR_lo
Wheat_RioVerde_IRR_hi
Wheat_RioVerde_IRR_lo
Wheat_RusCstSE_IRR_hi
Wheat_RusCstSE_IRR_lo
Wheat_RusCstSE_RFD_hi
Wheat_RusCstSE_RFD_lo
Wheat_SabarmatiR_IRR_hi
Wheat_SabarmatiR_IRR_lo
Wheat_SabarmatiR_RFD_hi
Wheat_SabarmatiR_RFD_lo
Wheat_Salinas_IRR_hi
Wheat_Salinas_IRR_lo
Wheat_Salinas_RFD_hi
Wheat_Salinas_RFD_lo
Wheat_Salween_IRR_hi
Wheat_Salween_IRR_lo
Wheat_Salween_RFD_hi
Wheat_Salween_RFD_lo
Wheat_SAmerCstN_RFD_hi
Wheat_SAmerCstN_RFD_lo
Wheat_SAmerCstNE_RFD_hi
Wheat_SAmerCstNE_RFD_lo
Wheat_SaoFrancR_IRR_hi
Wheat_SaoFrancR_IRR_lo
Wheat_SaoFrancR_RFD_hi
Wheat_SaoFrancR_RFD_lo
Wheat_ScheldtR_IRR_hi
Wheat_ScheldtR_IRR_lo
Wheat_ScheldtR_RFD_hi
Wheat_ScheldtR_RFD_lo
Wheat_SChinaSea_IRR_hi
Wheat_SChinaSea_IRR_lo
Wheat_ScndnvN_RFD_hi
Wheat_ScndnvN_RFD_lo

Wheat_Scotland_IRR_hi
Wheat_Scotland_IRR_lo
Wheat_Scotland_RFD_hi
Wheat_Scotland_RFD_lo
Wheat_SeineR_IRR_hi
Wheat_SeineR_IRR_lo
Wheat_SeineR_RFD_hi
Wheat_SeineR_RFD_lo
Wheat_SenegalR_IRR_hi
Wheat_SenegalR_IRR_lo
Wheat_SenegalR_RFD_hi
Wheat_SenegalR_RFD_lo
Wheat_ShebJubR_IRR_hi
Wheat_ShebJubR_IRR_lo
Wheat_ShebJubR_RFD_hi
Wheat_ShebJubR_RFD_lo
Wheat_SinaiP_IRR_hi
Wheat_SinaiP_IRR_lo
Wheat_SinaiP_RFD_hi
Wheat_SinaiP_RFD_lo
Wheat_SittaungR_IRR_hi
Wheat_SittaungR_IRR_lo
Wheat_SittaungR_RFD_hi
Wheat_SittaungR_RFD_lo
Wheat_SpainCstSE_IRR_hi
Wheat_SpainCstSE_IRR_lo
Wheat_SpainCstSE_RFD_hi
Wheat_SpainCstSE_RFD_lo
Wheat_StLwrncR_IRR_hi
Wheat_StLwrncR_IRR_lo
Wheat_StLwrncR_RFD_hi
Wheat_StLwrncR_RFD_lo
Wheat_Sweden_IRR_hi
Wheat_Sweden_IRR_lo
Wheat_Sweden_RFD_hi
Wheat_Sweden_RFD_lo
Wheat_SyrDaryaR_IRR_hi
Wheat_SyrDaryaR_IRR_lo
Wheat_SyrDaryaR_RFD_hi
Wheat_SyrDaryaR_RFD_lo
Wheat_TagusR_IRR_hi
Wheat_TagusR_IRR_lo
Wheat_TagusR_RFD_hi
Wheat_TagusR_RFD_lo
Wheat_Taiwan_RFD_hi
Wheat_Taiwan_RFD_lo
Wheat_TaptiR_IRR_hi
Wheat_TaptiR_IRR_lo
Wheat_TaptiR_RFD_hi
Wheat_TaptiR_RFD_lo
Wheat_Tarim_IRR_hi
Wheat_Tarim_IRR_lo
Wheat_Tarim_RFD_hi
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Wheat_Tasmania_IRR_hi
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Wheat_TennR_RFD_lo
Wheat_TexasCst_IRR_hi
Wheat_TexasCst_IRR_lo
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Wheat_TexasCst_RFD_lo
Wheat_ThaiGulf_RFD_hi
Wheat_ThaiGulf_RFD_lo
Wheat_TiberR_IRR_hi
Wheat_TiberR_IRR_lo
Wheat_TiberR_RFD_hi
Wheat_TiberR_RFD_lo
Wheat_TigrEuphR_IRR_hi
Wheat_TigrEuphR_IRR_lo
Wheat_TigrEuphR_RFD_hi
Wheat_TigrEuphR_RFD_lo
Wheat_TocantinsR_IRR_hi
Wheat_TocantinsR_IRR_lo
Wheat_TocantinsR_RFD_hi
Wheat_TocantinsR_RFD_lo
Wheat_UralR_IRR_hi
Wheat_UralR_IRR_lo
Wheat_UralR_RFD_hi
Wheat_UralR_RFD_lo
Wheat_UsaColoRN_IRR_hi
Wheat_UsaColoRN_IRR_lo
Wheat_UsaColoRN_RFD_hi
Wheat_UsaColoRN_RFD_lo
Wheat_UsaColoRS_IRR_hi
Wheat_UsaColoRS_IRR_lo
Wheat_UsaColoRS_RFD_hi
Wheat_UsaColoRS_RFD_lo
Wheat_UsaCstE_IRR_hi
Wheat_UsaCstE_IRR_lo

Wheat_UsaCstE_RFD_hi
Wheat_UsaCstE_RFD_lo
Wheat_UsaCstNE_IRR_hi
Wheat_UsaCstNE_IRR_lo
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Wheat_UsaCstSE_IRR_hi
Wheat_UsaCstSE_IRR_lo
Wheat_UsaCstSE_RFD_hi
Wheat_UsaCstSE_RFD_lo
Wheat_UsaPacNW_IRR_hi
Wheat_UsaPacNW_IRR_lo
Wheat_UsaPacNW_RFD_hi
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Wheat_VolgaR_IRR_lo
Wheat_VolgaR_RFD_hi
Wheat_VolgaR_RFD_lo
Wheat_WislaR_IRR_hi
Wheat_WislaR_IRR_lo
Wheat_WislaR_RFD_hi
Wheat_WislaR_RFD_lo
Wheat_XunJiang_IRR_hi
Wheat_XunJiang_IRR_lo
Wheat_XunJiang_RFD_hi
Wheat_XunJiang_RFD_lo
Wheat_Yangtze_IRR_hi
Wheat_Yangtze_IRR_lo
Wheat_Yangtze_RFD_hi
Wheat_Yangtze_RFD_lo
Wheat_YeniseiR_IRR_hi
Wheat_YeniseiR_IRR_lo
Wheat_YeniseiR_RFD_hi
Wheat_YeniseiR_RFD_lo
Wheat_YucatanP_RFD_hi
Wheat_YucatanP_RFD_lo
Wheat_ZambeziR_IRR_hi
Wheat_ZambeziR_IRR_lo
Wheat_ZambeziR_RFD_hi
Wheat_ZambeziR_RFD_lo
Wheat_ZiyaHe_IRR_hi
Wheat_ZiyaHe_IRR_lo
Wheat_ZiyaHe_RFD_hi
Wheat_ZiyaHe_RFD_lo

| sector | subsector | technology | input | Units | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| trn_aviation_intl | International Aviation | BEV | elect_td_trn | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_aviation_intl | International Aviation | Hydrogen | H2 wholesale dispensing | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_aviation_intl | International Aviation | Liquids | refined liquids enduse | EJ | 451360 | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_freight | Domestic Ship | BEV | elect_td_trn | EJ | | | | | 427350 | 428400 | 429450 | 430500 |
| trn_freight | Domestic Ship | FCEV | H2 wholesale dispensing | EJ | | | | | 427350 | 428400 | 429450 | 430500 |
| trn_freight | Domestic Ship | Hybrid Liquids | refined liquids enduse | EJ | | 424200 | 425250 | 426300 | 427350 | 428400 | 429450 | 430500 |
| trn_freight | Domestic Ship | Liquids | refined liquids enduse | EJ | 423150 | 424200 | 425250 | 426300 | 427350 | 428400 | 429450 | 430500 |
| trn_freight | Freight Rail | BEV | elect_td_trn | EJ | | | 439425 | 440510 | 441595 | 442680 | 443765 | 444850 |
| trn_freight | Freight Rail | Coal | delivered coal | EJ | 112840 | | | | | | | |
| trn_freight | Freight Rail | Electric | elect_td_trn | EJ | 338520 | 339360 | 340200 | 341040 | 341880 | 342720 | 343560 | 344400 |
| trn_freight | Freight Rail | FCEV | H2 wholesale dispensing | EJ | | | 439425 | 440510 | 441595 | 442680 | 443765 | 444850 |
| trn_freight | Freight Rail | Hybrid Liquids | refined liquids enduse | EJ | | | 439425 | 440510 | 441595 | 442680 | 443765 | 444850 |
| trn_freight | Freight Rail | Liquids | refined liquids enduse | EJ | 437255 | 438340 | 439425 | 440510 | 441595 | 442680 | 443765 | 444850 |
| trn_freight_road | Heavy truck | BEV | elect_td_trn | EJ | | | 1381050 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Heavy truck | FCEV | H2 retail dispensing | EJ | | | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Heavy truck | Hybrid Liquids | refined liquids enduse | EJ | | 1696800 | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Heavy truck | Liquids | refined liquids enduse | EJ | 1692600 | 1696800 | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Light truck | BEV | elect_td_trn | EJ | | | 1757700 | 1762040 | 1766380 | 1328040 | 887530 | 444850 |
| trn_freight_road | Light truck | FCEV | H2 retail dispensing | EJ | | | 1757700 | 1762040 | 1766380 | 1328040 | 887530 | 444850 |
| trn_freight_road | Light truck | Hybrid Liquids | refined liquids enduse | EJ | | 1753360 | 1757700 | 1762040 | 1766380 | 1328040 | 887530 | 444850 |
| trn_freight_road | Light truck | Liquids | refined liquids enduse | EJ | 1749020 | 1753360 | 1757700 | 1762040 | 1766380 | 1328040 | 887530 | 444850 |
| trn_freight_road | Light truck | NG | delivered gas | EJ | 56420 | 56560 | 56700 | 56840 | 56980 | 42840 | 28630 | 14350 |
| trn_freight_road | Medium truck | BEV | elect_td_trn | EJ | | | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Medium truck | FCEV | H2 retail dispensing | EJ | | | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Medium truck | Hybrid Liquids | refined liquids enduse | EJ | | 1696800 | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_freight_road | Medium truck | Liquids | refined liquids enduse | EJ | 1692600 | 1696800 | 1701000 | 1705200 | 1709400 | 1285200 | 858900 | 430500 |
| trn_pass | Domestic Aviation | BEV | elect_td_trn | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_pass | Domestic Aviation | Hydrogen | H2 wholesale dispensing | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_pass | Domestic Aviation | Liquids | refined liquids enduse | EJ | 451360 | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_pass | HSR | Electric | elect_td_trn | EJ | 84630 | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_pass | Passenger Rail | Electric | elect_td_trn | EJ | 394940 | 395920 | 396900 | 397880 | 398860 | 399840 | 400820 | 401800 |
| trn_pass | Passenger Rail | Liquids | refined liquids enduse | EJ | 437255 | 438340 | 439425 | 440510 | 441595 | 442680 | 443765 | 444850 |
| trn_pass_road | Bus | BEV | elect_td_trn | EJ | | | 1360800 | 1364160 | 1367520 | 1370880 | 916160 | 459200 |
| trn_pass_road | Bus | FCEV | H2 retail dispensing | EJ | | | 1360800 | 1364160 | 1367520 | 1370880 | 916160 | 459200 |
| trn_pass_road | Bus | Hybrid Liquids | refined liquids enduse | EJ | | 1357440 | 1360800 | 1364160 | 1367520 | 1370880 | 916160 | 459200 |
| trn_pass_road | Bus | Liquids | refined liquids enduse | EJ | 1354080 | 1357440 | 1360800 | 1364160 | 1367520 | 1370880 | 916160 | 459200 |
| trn_pass_road | Bus | NG | delivered gas | EJ | 1057875 | 1060500 | 1063125 | 1065750 | 1068375 | 1071000 | 715750 | 358750 |
| trn_pass_road_LDV | 2W and 3W | BEV | elect_td_trn | EJ | 14105 | | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_pass_road_LDV | 2W and 3W | LA-BEV | elect_td_trn | EJ | 14105 | 14140 | 14175 | 14210 | 14245 | 14280 | 14315 | |
| trn_pass_road_LDV | 2W and 3W | Liquids | refined liquids enduse | EJ | 451360 | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_pass_road_LDV | 2W and 3W | NG | delivered gas | EJ | 98735 | 98980 | 99225 | 99470 | 99715 | 99960 | 100205 | 100450 |
| trn_pass_road_LDV_4W | Car | BEV | elect_td_trn | EJ | | | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Car | FCEV | H2 retail dispensing | EJ | | | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Car | Hybrid Liquids | refined liquids enduse | EJ | 634725 | 1919000 | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Car | Liquids | refined liquids enduse | EJ | 2256800 | 1919000 | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Car | NG | delivered gas | EJ | 1763125 | 1565500 | 1701000 | 1705200 | 1424500 | 1071000 | 715750 | 358750 |
| trn_pass_road_LDV_4W | Large Car and Truck | BEV | elect_td_trn | EJ | | | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Large Car and Truck | FCEV | H2 retail dispensing | EJ | | | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Large Car and Truck | Hybrid Liquids | refined liquids enduse | EJ | | 1919000 | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Large Car and Truck | Liquids | refined liquids enduse | EJ | 2256800 | 1919000 | 2075625 | 2202550 | 1823360 | 1370880 | 916160 | 459200 |
| trn_pass_road_LDV_4W | Large Car and Truck | NG | delivered gas | EJ | 1622075 | 1424100 | 1559250 | 1563100 | 1310540 | 985320 | 658490 | 330050 |
| trn_pass_road_LDV_4W | Mini Car | BEV | elect_td_trn | EJ | | | 1437750 | 1563100 | 1310540 | 985320 | 658490 | 330050 |
| trn_pass_road_LDV_4W | Mini Car | FCEV | H2 retail dispensing | EJ | | | 1437750 | 1563100 | 1310540 | 985320 | 658490 | 330050 |
| trn_pass_road_LDV_4W | Mini Car | Hybrid Liquids | refined liquids enduse | EJ | | 1353400 | 1437750 | 1563100 | 1310540 | 985320 | 658490 | 330050 |
| trn_pass_road_LDV_4W | Mini Car | Liquids | refined liquids enduse | EJ | 1622075 | 1353400 | 1437750 | 1563100 | 1310540 | 985320 | 658490 | 330050 |
| trn_pass_road_LDV_4W | Mini Car | NG | delivered gas | EJ | 1057875 | 929200 | 992250 | 994700 | 854700 | 642600 | 429450 | 215250 |
| trn_shipping_intl | International Ship | BEV | elect_td_trn | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_shipping_intl | International Ship | FCEV | H2 wholesale dispensing | EJ | | | | | 455840 | 456960 | 458080 | 459200 |
| trn_shipping_intl | International Ship | Hybrid Liquids | refined liquids enduse | EJ | | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |
| trn_shipping_intl | International Ship | Liquids | refined liquids enduse | EJ | 451360 | 452480 | 453600 | 454720 | 455840 | 456960 | 458080 | 459200 |

**From:** Francisco De La Chesnaye
**Sent:** Tue, 16 May 2023 16:41:19 +0000
**To:** Curry, Thomas; Iyer, Gokul; Skone, Timothy; Jasmine Greene; Whitman, Peter C
**Cc:** Harker-Steele, Amanda J (NETL); Sweeney, Amy; Edmonds, James A (Jae)
**Subject:** [EXTERNAL] LNG Project Coordination on Reports and Timeline
**Attachments:** DOE_FECM_LNG_2023_Docket_Outline_V1.docx
**Importance:** High

All,

Please see drafts of outlines for the eventual "Docket" report and Modeling and Analysis Report that we will need to write and support as deliverables for the LNG Export project. These are based on the lasts couple of docket submission and modeling.
There is also a "working schedule" to review.

Will go over this later today at 1 pm.

Best, paco

**********
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Use caution if this message contains attachments, links or requests for information.

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**ENERGY AND ECONOMIC MODELING AND ANALYSIS**
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**ORDER AMENDING LONG-TERM AUTHORIZATION TO EXPORT LIQUEFIED NATURAL GAS TO NON-FREE TRADE AGREEMENT NATIONS**
**DOE/FECM ORDER NO. XXXX-X (Date xx, 2023)**

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**Working Schedule**

| | **PPNL and OL Teams** | **Report Writing** | |
|---|---|---|---|
| **Dates w/o** | **Modeling efforts** | **MODELING AND ANALYSIS** | **ORDER** |
| 5/15/2023 | Decide on scenarios and align on key variables | | |
| | GCAM and NEMS (AEO23 & FECM) coordination | D: Background On LNG Export Studies | |
| | GCAM Run on Sce 1 to 6 | D: Introduction & Scenario Design | Introduction & Background |
| | GCAM Run on Sce 1 to 6 and Review | D: Study Methodology And Key Assumptions | Public Interest Standard |
| | PNNL pass results to OL and start NEMS runs | | |
| | NEMS Runs on Sce 1 - 6 | | Description Of Request |
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| | Review and comparison of NEMS and GCAM results | D: Natural Gas Market Results | FERC Proceeding |
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| | Possible model adjustments and new runs | | - Non-Environmental Issues |
| | | | - Environmental Issues |
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| 9/30/2023 | | FINAL VERSION | FINAL VERSION |

**Sent:** Tue, 27 Jun 2023 13:39:59 +0000
**To:** Jamieson, Matthew B.
**Subject:** RE: Index

Matt,

Good questions!

Option #2. This answers my question whether we need emission factor scalars by time interval or if we could use one single factor. Due to the embedded mitigation within GCAM we will have to model the index at the 5-year time interval for the US and each country.

LCA profile X Scaler to index

LCA-2020 g CO2/MJ LHV footprint per applicable GCAM boundary X (GCAM-2020 g CO2/MJ LHV Country-Y / GCAM-2020 g CO2/MJ LHV USA) X (GCAM-Year g CO2/MJ LHV Country-Y / GCAM-2020 g CO2/MJ LHV Country-Y)

---

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Monday, June 26, 2023 5:00 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: Index

DRAFT * DELIBERATIVE * PRE-DECISIONAL

Tim,

I was checking out the latest file a bit more today, specifically looked at the emissions factor reductions for the US over time. From 2015 to 2050, the US CO2e for just the natural gas sector non-CO2 emissions (mostly methane) go down by 29% - the biggest drop occurring between 2035 and 2040 (~12%). I mentioned to the team that we'll have to be thinking about this, but I also wanted to bring it to your attention to see if you had any specific reaction. I foresee three options:

1. Ignore the methane mitigation in GCAM when we insert our factors. I think this all means keeping the emissions factor constant for other countries as well (like modify them all to use the EF determined from 2020 data).
2. Apply the GCAM methane mitigation rates to the NETL natural gas data.
3. Determine our own reductions from NETL methane abatement curve. I see this as a pretty in-depth effort, and since these actions seem to be endogenous to GCAM (based on GCAM-determined market pricing and their abatement curves), will end up creating quite a bit of consistency. In other words, I recognize that this might be desirable to be consistent with our own analysis, but I really can't recommend it.

| scenario | sector | technology | year | output;EJ_TOTAL;USA | co2_eq_mt_TOTAL;USA | ef_usa | g CH4/M |
|---|---|---|---|---|---|---|---|

| | | | | | | | J (LHV) |
|---|---|---|---|---|---|---|---|
| S1: Existing Capacity | natural gas | natural gas | 2015 | 26.2 | 141.0 | 5.4 | 0.15 |
| S1: Existing Capacity | natural gas | natural gas | 2020 | 33.1 | 171.5 | 5.2 | 0.14 |
| S1: Existing Capacity | natural gas | natural gas | 2025 | 35.3 | 179.8 | 5.1 | 0.14 |
| S1: Existing Capacity | natural gas | natural gas | 2030 | 40.4 | 194.1 | 4.8 | 0.13 |
| S1: Existing Capacity | natural gas | natural gas | 2035 | 44.5 | 196.7 | 4.4 | 0.12 |
| S1: Existing Capacity | natural gas | natural gas | 2040 | 47.9 | 187.5 | 3.9 | 0.11 |
| S1: Existing Capacity | natural gas | natural gas | 2045 | 52.4 | 200.6 | 3.8 | 0.11 |
| S1: Existing Capacity | natural gas | natural gas | 2050 | 57.1 | 214.4 | 3.8 | 0.10 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2015 | 26.2 | 141.0 | 5.4 | 0.15 |
| S2: Remove LNG Export Capacity | natural gas | natural gas | 2020 | 33.1 | 171.5 | 5.2 | 0.14 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Constraint | | | | | | | |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2025 | 35.3 | 179.8 | 5.1 | 0.14 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2030 | 40.4 | 194.1 | 4.8 | 0.13 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2035 | 42.9 | 189.6 | 4.4 | 0.12 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2040 | 47.0 | 183.9 | 3.9 | 0.11 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2045 | 54.1 | 207.3 | 3.8 | 0.11 |
| S2: Remove LNG Export Capacity Constraint | natural gas | natural gas | 2050 | 62.3 | 233.9 | 3.8 | 0.10 |

Just for comparison, the One future report (Exhibit 6-2) shows a CH4 emission rate of 0.08 g CH4/MJ NG (HHV) – roughly converting to 0.09 g CH4/MJ NG (LHV). You can see that the GCAM values are significantly higher than that – probably more in line with the 2% leakage rate.

Matt Jamieson
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis &Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Thursday, June 22, 2023 1:21 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** RE: Index

DRAFT*DELIBERATIVE*PRE-DECISIONAL

The more I look at it, the Index file has everything from the output file joined to the aggregated emissions file.

Some of the output file entries are describing the flow of a commodity but do not have any associated emissions profiles.

Electricity and District Heat show up as zero for all sectors. I think this is because the electricity and district heat are handled separately and then distributed to the sector demanding the electricity. That means the regional electricity mix from the composite electricity profiles have the emissions data.

We will need to figure out how to assign the electricity mix regional emissions profiles to the economic sectors that are demanding electricity.

Examples:

1. Agricultural Energy Use/Electricity
2. Aluminum/Electricity
3. Chemical Energy Use/Electricity
4. CO2 Removal/hightemp DAC Elec
5. Comm Cooling/Electricity
6. Comm Heating/Electricity
7. Etc.

---

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, June 22, 2023 1:06 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: Index

Nevermind – looking at it now. I see for 1 that "natural gas/natural gas" has 0 for output. Note that Matt Binsted responded in the attached earlier today. Coal and crude oil would be similarly impacted.

It looks for the rest of the outputs that there won't be energy outputs – just mass that we're not worried about for this result.

Matt Jamieson
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis &Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

---

**From:** Jamieson, Matthew B.
**Sent:** Thursday, June 22, 2023 12:51 PM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: Index

I did make the request below btw.

Can you provide a specific example just to focus my review…or I might already have a response from my previous looks.

Matt Jamieson
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis &Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Thursday, June 22, 2023 12:43 PM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** RE: Index

Matt,

Looking at the data in the index file, there are a lot more zero entries then expected from the GCAM data.

CO2 emissions but no energy output data reported for the US or the regions.

Interested in your reactions once you have an opportunity to review.

Thanks,

Tim

**From:** Skone, Timothy
**Sent:** Thursday, June 22, 2023 11:38 AM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** RE: Index

Thanks Matt!

This is good!

Can you see if Mike can produce the same table but with Rows G, I, and L (GHG results) into three columns by mass of CO2, CH4, and N2O.

We can then apply the GWP values separately. Why – alignment with GCAM will need to be at the environmental flow level (species) and not GWP aggregated level.

Thanks,

Tim

---

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, June 22, 2023 11:26 AM
**To:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: Index

Oh sorry – I didn't even realize that was a link…I had just clicked on it.

Anyhow, it's up on HQ teams:
https://usdoe.sharepoint.com/:f:/r/sites/FECMNETLLCA/Shared%20Documents/General/LNG_regulatory_analysis?csf=1&web=1&e=g8a0U9

Matt Jamieson
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis &Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

---

**From:** Skone, Timothy <timothy.skone@hq.doe.gov>
**Sent:** Thursday, June 22, 2023 11:12 AM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Subject:** FW: Index

Matt,

Can you post to the FECM NETL LCA channel for me?

FYI - I am working on getting a Teams channel set-up for this project so we can directly share files without going through the general FECM LCA site.

Thanks,

Tim

---

**From:** Blackhurst, Michael (CONTR) <Michael.Blackhurst@netl.doe.gov>
**Sent:** Thursday, June 22, 2023 11:00 AM
**To:** Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Matthews, Howard Scott (CONTR) <scott.matthews@netl.doe.gov>
**Subject:** FW: Index

index.zip

---

**From:** Blackhurst, Michael (CONTR)
**Sent:** Thursday, June 22, 2023 10:52 AM
**To:** Skone, Timothy J <timothy.skone@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@netl.doe.gov>
**Cc:** Scott Matthews <scott.matthews@keylogic.com>
**Subject:** Index

Tim and Matt

Attached are estimates of the index Tim requested to the best of my understanding.

I expect to spend the remainder of my time organizing and preparing files to facilitate a smooth transition for others.

Best,

Mike

**From:** Francisco De La Chesnaye
**Sent:** Mon, 8 May 2023 21:30:48 +0000
**To:** Francisco De La Chesnaye; Iyer, Gokul; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson
**Cc:** Harker-Steele, Amanda J (NETL); Skone, Timothy; Curry, Thomas
**Subject:** DOE FECM LNG Export Project Status

This is best time early this week. Gokul and Amanda, please forward to others on your team as needed.

Focus for this meeting is on the following:

- Natural gas alignment
  - Teams will align on natural gas prices and qualities between NEMS and GCAM in Scenario 1
  - Compare results in Scenarios 2 to 6 to understand result and model differences
  - NEMS results can also provide insights into U.S. basin source and infrastructure insights

- Scenario 6 - Net Zero Alignment and comparison
  - GCAM to provide to FECM-NEMS:
    - Net Cap Target for $CO_2$ from Fossil Energy to 2050
    - U.S. LNG Export Demand
  - Align on tech assumptions on #6 between GCAM and FECM-NEMS ($H_2$, BECS, DAC, non-$CO_2$, others?)

---

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**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Monday, May 8, 2023 9:42 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Michael Blackhurst <michael.blackhurst@keylogic.com>; Edmonds, James A (Jae) <jae@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** DOE FECM LNG Export Project Status
**Importance:** High

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thank you all for very productive meeting last Friday. Below is a summary of my notes on next steps for meetings and continued team coordination. Please review and let me know if any priorities or key items are missing.
We will be in touch soon on setting up meeting ahead of Friday's standing meeting.

Best, Paco

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PNNL team please let us know when we can schedule a 1.5 hr meeting in those times.

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Additional meeting to focus on IRA provisions and modeling implementation, plan is to connect when Matt Binsted is back early in week of May 15. PNNL Team, please let us know available times to confirm meeting.

**Key issues / items to consider / Action Items as of May 8, 2023**

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    - Renamed Scenario 4 to "Regional Import Limits"

- Impose existing LNG export capacity constraint of 27.34 Bcf/d across all models in Scenario 1

- Natural gas alignment
  - Teams will align on natural gas prices and qualities between NEMS and GCAM in Scenario 1
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  - NEMS results can also provide insights into U.S. basin source and infrastructure insights

- Review of IRA Provisions
  - Teams to compare IRA implementation across GCAM, AEO23-NEMS and FECM-NEMS in the Reference Scenario 1 to understand different implementation and mitigation results

- Scenario 6 - Net Zero Alignment and comparison
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    - U.S. LNG Export Demand
  - Align on tech assumptions on #6 between GCAM and FECM-NEMS ($H_2$, BECS, DAC, non-$CO_2$, others?)
  - Evaluate GCAM global and regional GHG emission changes across scenarios

Pending Updates:
- Project Timeline & Coordination
- Draft annotated outline for Modeling Report for NEMS and GCAM and share with PNNL and LCA Teams

Francisco De La Chesnaye | **Vice President**
m: (b) (6) | onlocationinc.com

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**From:** Francisco De La Chesnaye
**Sent:** Fri, 1 Sep 2023 14:41:24 +0000
**To:** Francisco De La Chesnaye; Iyer, Gokul; Edmonds, James A (Jae); Binsted, Matthew; Wolfram, Paul; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Skone, Timothy
**Cc:** Curry, Thomas; Yarlagadda, Brinda; Sweeney, Amy; Harker-Steele, Amanda J (NETL); Robert Wallace; Agboola, Ajoke; Jamieson, Matthew B.; Wallace, Robert T. (CONTR); Scott Matthews; Matthews, Howard Scott (CONTR)
**Subject:** [EXTERNAL] Canceled: FECM LNG Export Project Coordination
**Importance:** High

**Removing from calendar and using time to finish latest version of Main Report.**

---

# Microsoft Teams meeting

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**********

**From:** Curry, Thomas
**Sent:** Fri, 28 Jul 2023 18:43:47 +0000
**To:** Harker-Steele, Amanda J (NETL); Skone, Timothy; Sweeney, Amy; Easley, Kevin
**Cc:** Robert Wallace; hartesingh@deloitte.com; Adder, Justin (NETL); Francisco De La Chesnaye
**Subject:** RE: LNG Regulatory Analysis FWP - Task 4 Deliverable
**Attachments:** Draft_Env.Review_Task4_LNG_LNGRegAnalysisSupport_FWP-DraftPreDecisional_7_28_23.docx

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Amanda and Team,

As Kevin mentioned in an earlier email, the HQ team has reviewed the updated draft and added edits and comments throughout, those are consolidated in the attached file. We appreciate that the team updated resources and we understand that you are adding additional resources based on conversations with Tim and Kevin.

In addition to the detailed comments in the attached, we wanted to provide the overarching comments listed below.

I am going to be on vacation next week, but I know Kevin and Tim have scheduled time to meet with you. Please stay in communication with Kevin and Tim as you are working on this next round of updates.

I hope you have a good weekend.

Tom

**Overarching Comments**

- Global: Chapters 2-7 should include a brief summary of the findings or key takeaways, this could be at the opening or the end of the chapter but should be consistent in each chapter.
- Chapter 1: The regulatory review should be shortened and kept at a high level.
- Remaining chapters:
  - Remove regulatory sections
  - Include R&D in each section but create a parallel section
- Chapter 7: revamp the current DRAFT as follows:
  - Provide a condensed, succinct explanation of justice concerns in general (perhaps <= 1 page)
  - Lay out a brief treatment of energy justice more specifically (**NOTE**: Kevin / Natenna to discuss)
  - Summarize literature available on potential justice impacts related to unconventional natural gas
    - Any academic type studies of impacts of unconventional natural gas production, and of LNG projects (e.g., pipeline buildout, community impacts – from fenceline to regionally)
    - If that literature is limited or non-existent in an academic context, broaden scope first to any kind of oil and/or gas project, then to other types of energy projects (e.g., power lines)
    - If even that literature is limited or non-existent, the Addendum must clearly state that EJ type literature is currently limited; additionally, in the interest of providing

useful information for decisions makers and the public in general, present EJ summary information from:

- FERC EISs for LNG projects – EJ sections
- State studies or guidelines?
- Revisit the 2022 Ethane Report and its EJ / Stakeholder Engagement content / findings
- Other sources detailing energy development and EJ (except news journals, Op Eds, etc.)

---

**From:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Sent:** Friday, July 21, 2023 3:52 PM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Easley, Kevin <kevin.easley@hq.doe.gov>
**Cc:** Robert Wallace <robert.wallace@keylogic.com>; hartesingh@deloitte.com; Adder, Justin (NETL) <justin.adder@netl.doe.gov>; Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Subject:** LNG Regulatory Analysis FWP - Task 4 Deliverable

Hi Tom, Amy, Tim, and Kevin,

*DRAFT*DELIBERATIVE*PRE-DECISIONAL*

Please find the revised draft of the update to the 2014 Addendum to the Environmental Review attached. We look forward to receiving your feedback and appreciate you allowing us the opportunity to improve the original draft.

I have also attached a .zip folder that contains notes from and slides presented during the meetings we had today.

I will be on travel next week but am reachable by email and in-person if you are in the D.C. area. I will be there for a conference.

I hope you all have a nice weekend!

Sincerely,
**Amanda J. Harker Steele, Ph.D.** (she/her)
Research Economist – EMAT, SSAE
National Energy Technology Laboratory (NETL)
Department of Energy
3610 Collins Ferry Rd.
Morgantown, WV 26508
Amanda.HarkerSteele@netl.doe.gov
304-285-0207



DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Amanda and Team,

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---

**From:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Sent:** Friday, July 21, 2023 3:52 PM

**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Easley, Kevin <kevin.easley@hq.doe.gov>
**Cc:** Robert Wallace <robert.wallace@keylogic.com>; hartesingh@deloitte.com; Adder, Justin (NETL) <justin.adder@netl.doe.gov>; Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Subject:** LNG Regulatory Analysis FWP - Task 4 Deliverable

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*DRAFT*DELIBERATIVE*PRE-DECISIONAL*

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I hope you all have a nice weekend!

Sincerely,
**Amanda J. Harker Steele, Ph.D.** (she/her)
Research Economist – EMAT, SSAE
National Energy Technology Laboratory (NETL)
Department of Energy
3610 Collins Ferry Rd.
Morgantown, WV 26508
Amanda.HarkerSteele@netl.doe.gov
304-285-0207



**From:** Edmonds, James A (Jae)
**Sent:** Mon, 8 May 2023 15:47:44 +0000
**To:** Iyer, Gokul; Francisco De La Chesnaye; Binsted, Matthew; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Curry, Thomas
**Cc:** Yarlagadda, Brinda; Sweeney, Amy; Harker-Steele, Amanda J (NETL); Robert Wallace; Agboola, Ajoke; Jamieson, Matthew B.; Michael Blackhurst; Wolfram, Paul; Skone, Timothy
**Subject:** RE: DOE FECM LNG Export Project Status

I'm tied up at the EPRI meeting Wednesday afternoon. But, I think you can make progress without me.

jae

---

**From:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>
**Sent:** Monday, May 8, 2023 11:42 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Michael Blackhurst <michael.blackhurst@keylogic.com>; Edmonds, James A (Jae) <jae@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: DOE FECM LNG Export Project Status

Hi Paco,

Thanks.

2-3:30 on Wednesday would work for us.

Gokul

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Monday, May 8, 2023 9:42 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Michael Blackhurst <michael.blackhurst@keylogic.com>; Edmonds, James A (Jae) <jae@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>

**Subject:** DOE FECM LNG Export Project Status
**Importance:** High

Check twice before you click! This email originated from outside PNNL.

DRAFT – DELIBERATIVE – PRE-DECISIONAL

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    - Evaluate GCAM global and regional GHG emission changes across scenarios

Pending Updates:

- Project Timeline & Coordination
- Draft annotated outline for Modeling Report for NEMS and GCAM and share with PNNL and LCA Teams

Francisco De La Chesnaye | **Vice President**
m: (b) (6) | onlocationinc.com






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**From:** Francisco De La Chesnaye
**Sent:** Fri, 11 Aug 2023 15:59:33 +0000
**To:** Iyer, Gokul; Edmonds, James A (Jae); Binsted, Matthew; Wolfram, Paul; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Skone, Timothy
**Cc:** Curry, Thomas; Yarlagadda, Brinda; Sweeney, Amy; Harker-Steele, Amanda J (NETL); Robert Wallace; Agboola, Ajoke; Jamieson, Matthew B.; Wallace, Robert T. (CONTR); Scott Matthews; Matthews, Howard Scott (CONTR)
**Subject:** [EXTERNAL] RE: FECM LNG Export Project Coordination

I'm going to be a few minutes late on call due to car issues.

---

**From:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>
**Sent:** Friday, August 11, 2023 9:11 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Curry, Thomas <thomas.curry@hq.doe.gov>; Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Wallace, Robert T. (CONTR) <robert.wallace@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Subject:** RE: FECM LNG Export Project Coordination

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thanks, Paco. I would like to include a discussion on the structure/ format for the executive summary. I worked on a first draft but it would be good to discuss the following questions as a group:

- Should the executive summary include a summary figure of some sort?
- What is the right proportion of background versus results?
- Should we put together some broader recommendations or simply leave it at objective analysis?
- Should we highlight any caveats?

Best,
Gokul

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Friday, August 11, 2023 8:53 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Cc:** Curry, Thomas <thomas.curry@hq.doe.gov>; Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Wallace, Robert T. (CONTR) <robert.wallace@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Subject:** FECM LNG Export Project Coordination

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

All,

For today's coordination meeting, I have the following proposed items to cover:

1. Final check on analysis and results for GCAM and NEMS with a focused discussion on comparison between S6 and S7
2. Update on the Task 3 - LCA
3. Review of Report Schedule
4. Planning for DOE cross office and leadership briefings on final results

Please advise if other items should be added to today's meeting.

Thanks, Paco

**Francisco De La Chesnaye | Vice President**
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**********

**From:** Curry, Thomas
**Sent:** Fri, 16 Jun 2023 15:59:28 +0000
**To:** Iyer, Gokul; Francisco De La Chesnaye; Edmonds, James A (Jae); Binsted, Matthew; Wolfram, Paul; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Sweeney, Amy
**Cc:** Harker-Steele, Amanda J (NETL); Robert Wallace; Agboola, Ajoke; Jamieson, Matthew B.; Michael Blackhurst; Wallace, Robert T. (CONTR)
**Subject:** RE: Friday, June 16: FECM LNG Export Project Coordination

DRAFT – DELIBERATIVE – PRE-DECISIONAL

For the leadership briefing, we will have people who were not on the previous briefing, I'd like to discuss the following outline:

- **Introduction to Modeling Team**
- **Overview of Analyses**
  - Current basis for regulatory decisions
  - Updated analyses
  - Scenarios
- **Preliminary GCAM results**
- **Preliminary NEMS results**
- **Initial Takeaways**
- **Next Steps**

We would like to send slides out COB Thursday (6/22) as a pre-read. The slides should include short descriptions of the scenarios.

For the GCAM results, I would like to discuss:

- where to cut slides from last time to provide time for the NEMS report out
- providing (or having available) regional output for Europe and Asia showing primary energy consumption and GHG emissions
- if we could / should have results of a version of S6 with an export constraint similar to S1

Tom

---

**From:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>
**Sent:** Friday, June 16, 2023 11:22 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Riera, Jefferson <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Harker-Steele, Amanda J (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <robert.wallace@netl.doe.gov>
**Subject:** RE: Friday, June 16: FECM LNG Export Project Coordination

This sounds good to me, thanks!

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Friday, June 16, 2023 8:47 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Harker-Steele, Amanda (NETL) <amanda.harkersteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Matthew.Jamieson@netl.doe.gov; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <robert.wallace@netl.doe.gov>
**Subject:** Friday, June 16: FECM LNG Export Project Coordination

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Items for today's Task 1 and Task 2 Coordination meeting:

1. Plan for Monday, June 26 FECM Leadership Briefing
2. Check on GCAM and NEMS model handshakes, inputs, outputs, tec.
3. Report Outlines
4. Project Timelines

Any others?

Thanks, Paco

**Francisco De La Chesnaye | Vice President**
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to the message.

**From:** Francisco De La Chesnaye
**Sent:** Thu, 31 Aug 2023 13:01:33 +0000
**To:** Curry, Thomas; Jamieson, Matthew B.; Scott Matthews; Iyer, Gokul
**Cc:** Skone, Timothy; Sweeney, Amy; Lavoie, Brian D.
**Subject:** [EXTERNAL] RE: Context for LCA results

Tom et al (and adding Gokul),

See responses below, Paco.

In the **Exec Summary**, the current GHG insight is, here is a proposed edit:

> "Third, even though U.S. LNG export continue to grow beyond existing and planned nameplate capacity across scenarios *S1* through *S5*, global and U.S. GHG emissions do not increase appreciably. GHG emissions in mitigation scenarios *S6* and *S7* are lower than the others as they are constrained by design. The Life Cycle Analysis, estimating market adjustment factors, also is consistent in indicating that the consequences of increasing U.S. LNG exports broadly do not lead to increased global GHG emissions."

This is a stronger and more robust statement supported by the data.

In the **Section V. Results, E. Global primary energy consumption and greenhouse gas emissions across all scenarios**

Overall, the seven scenarios explored in this study result in a range of outcomes for global energy consumption and emissions by 2050 (Figure 13). Fuel composition and sectoral allocation of GHG emissions are relatively similar across scenarios *S1* through *S5*. Total energy consumption and GHG emissions are the highest under the *S3* scenario driven by higher population growth and associated increases in energy demand. Total GHG emissions are lowest in the *S6* scenario due to lower projected costs of renewable energy. Important to note that total emissions in 2050 under scenarios *S1* through *S5* are relatively similar to 2015 levels because these scenarios include current policies and measures to reduce emissions.[11,12] By 2050 energy consumption is significantly higher compared to 2015 in these scenarios driven by growing population and economic growth. By contrast, total energy and emissions are lowest in scenarios *S6* and *S7* due to the emission pledges. As described earlier, these scenarios are also characterized by significant changes in the fuel composition of global energy consumption and the deployment of carbon dioxide removal technologies.

Made the above edits to reinforce that emissions differences between S2 to S5 are NOT due to changes in US LNG export but rather different assumptions (population, renewable costs) made in those respective sensitivity cases.

Edits on the interpretation of the "Interpretation of Market Adjustment Factor Results", I offer a few edits and leave the more technical interpretation to my LCA colleagues.

On an IPCC AR6 100-year basis, for S2-S1, the MAF result is approximately -5.3 g $CO_2$e/MJ. For purposes of comparison, NETL has estimated natural gas upstream emissions prior to delivery to a large industrial end user (like an LNG terminal) are 7.4 g $CO_2$e/MJ. The MAF indicates that as U.S. LNG exports increase, the induced global market effects result in an overall reduction in GHG emissions that is about 70% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S.

The MAF result for S7-S6 is about -3 g $CO_2$e/MJ. In a decarbonizing world, the overall reduction in emissions is 56% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S. This is consistent with the idea that as the global economy decarbonizes, the induced global decarbonization benefit of increased U.S. LNG will be less. Overall, both of these results are consistent with the overall GCAM results that increased U.S. exports do not lead to increased global GHG emissions. Global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. The GHG reductions represented by the negative MAF are not so large that U.S. LNG should be regarded as a major global climate reduction strategy but, at the same time, a negative MAF suggests that U.S. LNG is leading to some global decarbonization. A positive MAF would suggest U.S. LNG is leading to overall increased global emissions.

It is important to note that the MAF results are aggregated in relation to estimated future volumes of exported LNG from the U.S. in the context of a global model. They represent overall expected effects and not those of individual shipments or authorizations of LNG. It is not possible to conclude that every MJ of exported LNG from domestic gas sources would directly lead to the lower GHG emissions results suggested by the MAF.

---

**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Wednesday, August 30, 2023 6:33 PM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** Context for LCA results

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Team,

I'm trying to get my head around the LCA comparison. I don't think the results of the LCA or of GCAM suggest "U.S. LNG exports broadly lead to decarbonization in the global economy." Rather, I think we have found that exports support or at least are not inconsistent with decarbonization efforts. That is, global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. You should tell me if I'm off base with that conclusion.

Here is an attempt at redrafting the "Interpretation of Market Adjustment Factor Results" section of the LCA chapter, I think the comparison of the MAF for S2-S1 and the MAF for S7-S6 is a potentially important finding, if I've interpreted it correctly:

On an IPCC AR6 100-year basis, for S2-S1, the MAF result is approximately -5.3 g $CO_2$e/MJ. For purposes of comparison, NETL has estimated natural gas upstream emissions prior to delivery to a large industrial end user (like an LNG terminal) are 7.4 g $CO_2$e/MJ. The MAF indicates that as U.S. LNG exports increase, the induced global market effects result in an overall reduction in emissions that is about 70% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S.

The MAF result for S7-S6 is about -3 g $CO_2$e/MJ. In a decarbonizing world, the overall reduction in emissions is 56% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S. This is consistent with the idea that as the global economy decarbonizes, the induced global decarbonization benefit of increased U.S. LNG will be less.

Overall, both of these results are consistent with the overall GCAM results that increased U.S. exports support, or at least are not inconsistent with, global decarbonization efforts. Global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. The greenhouse gas reductions represented by the negative MAF are not so large that U.S. LNG should be regarded as a major global climate reduction strategy but, at the same time, a negative MAF suggests that U.S. LNG is leading to some global decarbonization. A positive MAF would suggest U.S. LNG is leading to overall increased global emissions.

It is important to note that the MAF results are aggregated in relation to estimated future volumes of exported LNG from the U.S. in the context of a global model. They represent overall expected effects and not those of individual shipments or authorizations of LNG. It is not possible to conclude that every MJ of exported LNG from domestic gas sources would directly lead to the lower GHG emissions results suggested by the MAF.

Tom Curry
Director, Division of Policy and Analysis
Office of Resource Sustainability
thomas.curry@hq.doe.gov
Tel: 202-586-5950
Cell: (b) (6)

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**From:** Curry, Thomas
**Sent:** Sat, 2 Sep 2023 16:52:59 +0000
**To:** Whitman, Peter C
**Cc:** Iyer, Gokul; Jamieson, Matthew B.; Sweeney, Amy; Daniel Hatchell; Francisco De La Chesnaye; Scott Matthews
**Subject:** Re: LNG export study key insights

Yes. Correct for the Exec Summary and expand in the conclusions.

Tom

**From:** Peter Whitman <peter.whitman@onlocationinc.com>
**Sent:** Saturday, September 2, 2023 10:24 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Iyer, Gokul <gokul.iyer@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Scott Matthews <scott.matthews@keylogic.com>
**Subject:** [EXTERNAL] RE: LNG export study key insights

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thanks, Tom. I believe your suggestion is to use these shortened bullet points for the executive summary and expand upon them for the conclusions section.

The Sharepoint question was not directed to you.

**Peter Whitman** | **Associate Director**
ph: 703.988.5927 | ext: 307 | m: (b) (6) | onlocationinc.com

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**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Saturday, September 2, 2023 9:25 AM
**To:** Scott Matthews <scott.matthews@keylogic.com>; Peter Whitman <peter.whitman@onlocationinc.com>
**Cc:** Iyer, Gokul C <gokul.iyer@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>
**Subject:** RE: LNG export study key insights

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thanks, Pete. I don't know the answer to Scott's question about SharePoint.

Yes, I think we should add an LCA insight. I took a shot at one below but would welcome edits and additional thoughts.

I rearranged the order below. I think it helps to have the GHG observations grouped together.

As I read through these, I think I had the order of the comparison reversed. But please correct me if I'm wrong.

A number of key insights emerge from this study:

1. Across all modeled scenarios, U.S. LNG exports and U.S. natural gas production increase beyond current levels ~~grow~~ through 2050.

2. Global natural gas consumption increases only slightly (<1 percent) in response to increased availability of U.S. natural gas exports when comparing ~~the reference case (S1) to a case that reflects global market demand for exports (S2)~~ a case that reflects global market demand for exports (S2) to the reference case (S1). The majority of U.S. natural gas substitutes for other global sources of gas.

4. U.S. natural gas prices as measured at Henry Hub increase modestly when comparing ~~the reference case (S1) to a case that reflects global market demand for exports (S2)~~ a case that reflects global market demand for exports (S2) to the reference case (S1). Across those scenarios, 2050 Henry Hub prices are projected to increase from $3.61/Mcf to $4.74/Mcf, both are less than the reference 2050 price expected in the most recent study DOE commissioned on the economic impacts from U.S. LNG exports in 2018.

5. U.S. residential prices are projected to be 4% higher in 2050 when comparing ~~the reference case (S1) to a case that reflects global market demand for exports (S2)~~ a case that reflects global market demand for exports (S2) to the reference case (S1).

6. The value of industrial shipments remains essentially unchanged (increasing less than .1% by 2050) when comparing ~~*S2 to S1*~~ a case that reflects global market demand for exports (S2) to the reference case (S1).

3. Global and U.S. GHG emissions do not change appreciably (global emissions range from 47.5-50.3 GtCO2e and U.S. emissions range from 4.3-4.6 GtCO2e) across the scenarios with current climate policy assumptions even though these scenarios vary widely in terms of U.S. LNG export outcomes (23-47 Bcf/day).

X. The induced global market effects of a case that reflects global market demand for exports (S2) compared to the reference case (S1) are equivalent to an overall reduction in GHG emissions that is about 70% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S.

7. Relative to the other scenarios, the scenarios in which countries are assumed to achieve GHG emissions pledges and pursue ambitious GHG mitigation policies (*S6* and *S7*) are characterized by lower energy consumption; lower fossil fuel consumption without carbon capture, utilization, and storage (CCUS); higher deployment of renewables and fossil fuels and biomass with CCUS; and higher deployment of carbon dioxide removal strategies.

---

**From:** Scott Matthews <scott.matthews@keylogic.com>
**Sent:** Saturday, September 2, 2023 8:18 AM
**To:** Whitman, Peter C <peter.whitman@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Iyer, Gokul <gokul.iyer@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>
**Subject:** [EXTERNAL] Re: LNG export study key insights

Making sure it's ok to directly edit the version on share point..?

Get Outlook for iOS

**Scott Matthews** | **Principal Scientist**
he/him
m: (b) (6) | keylogic.com
3168 Collins Ferry Rd, Morgantown, WV 26505



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**From:** Peter Whitman <peter.whitman@onlocationinc.com>
**Sent:** Friday, September 1, 2023 4:47:57 PM

**To:** thomas.curry@hq.doe.gov <thomas.curry@hq.doe.gov>
**Cc:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Jamieson, Matthew B. <Matthew.Jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>
**Subject:** LNG export study key insights

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Tom:

I took the latest version of the key insights and enclosed them below. If these look good, please tell us and we will use them as the basis for the conclusions section.
Is there something about the LCA that should go here?

Thank you.

A number of key insights emerge from this study:

1. Across all modeled scenarios, U.S. LNG exports and U.S. natural gas production grow through 2050 beyond current levels).

2. Global natural gas consumption increases only slightly (<1 percent) in response to increased availability of U.S. natural gas exports when comparing the reference case (S1) to a case that reflects global market demand for exports (S2). The majority of U.S. natural gas substitutes for other global sources of gas.

3. Global and U.S. GHG emissions do not change appreciably (global emissions range from 47.5-50.3 GtCO2e and U.S. emissions range from 4.3-4.6 GtCO2e) across the scenarios with current climate policy assumptions even though these scenarios vary widely in terms of U.S. LNG export outcomes (23-47 Bcf/day).

4. U.S. natural gas prices as measured at Henry Hub increase modestly when comparing the reference case (S1) to a case that reflects global market demand for exports (S2). Across those scenarios, 2050 Henry Hub prices are projected to increase from $3.61/Mcf to $4.74/Mcf, both are less than the reference 2050 price expected in the most recent study DOE commissioned on the economic impacts from U.S. LNG exports in 2018.

5. U.S. residential prices are projected to be 4% higher in 2050 when comparing the reference case (S1) to a case that reflects global market demand for exports (S2).

6. The value of industrial shipments remains essentially unchanged (increasing less than .1% by 2050) when comparing *S2* to *S1*.

7. Relative to the other scenarios, the scenarios in which countries are assumed to achieve GHG emissions pledges and pursue ambitious GHG mitigation policies (*S6* and *S7*) are characterized by lower energy consumption; lower fossil fuel consumption without carbon capture, utilization, and storage (CCUS); higher deployment of renewables and fossil fuels and biomass with CCUS; and higher deployment of carbon dioxide removal strategies.

**Peter Whitman | Associate Director**
ph: 703.988.5927 | ext: 307 | m: (b) (6) | onlocationinc.com






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**From:** Curry, Thomas
**Sent:** Fri, 16 Jun 2023 15:27:38 +0000
**To:** Harker-Steele, Amanda J (NETL); Francisco De La Chesnaye; Skone, Timothy; Sweeney, Amy
**Subject:** RE: Friday, June 16: FECM LNG Export Project Coordination

Hi Team,

I am in training today and will not be able to stay on for the full second hour. I believe Tim will be available for the second hour.

Tom

---

**From:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Sent:** Friday, June 16, 2023 9:26 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Riera, Jefferson <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <Robert.Wallace@NETL.DOE.GOV>
**Subject:** RE: Friday, June 16: FECM LNG Export Project Coordination

Sounds good! I saw your email about the Task 3 & 4 meeting after I sent my email. The outline seems to cover the bases. Thank you!

Sincerely,
**Amanda J. Harker Steele, Ph.D.** (she/her)
Research Economist – EMAT, SSAE
National Energy Technology Laboratory (NETL)
Department of Energy
3610 Collins Ferry Rd.
Morgantown, WV 26508
Amanda.HarkerSteele@netl.doe.gov
304-285-0207

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Friday, June 16, 2023 8:56 AM
**To:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>; Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T

<matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy R <amy.sweeney@hq.doe.gov>
**Cc:** Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <Robert.Wallace@NETL.DOE.GOV>
**Subject:** [EXTERNAL] RE: Friday, June 16: FECM LNG Export Project Coordination

Have not normally included PNNL on Task 3 & 4 meeting. I suggest we cover as much as possible on the 12 pm meeting and then see if need additional time at 1 pm. .

---

**From:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Sent:** Friday, June 16, 2023 8:49 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy R <amy.sweeney@hq.doe.gov>
**Cc:** Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <Robert.Wallace@NETL.DOE.GOV>
**Subject:** RE: Friday, June 16: FECM LNG Export Project Coordination

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Hi Paco,

Thanks! Will anyone from PNNL be on the call for the Task 3 & 4 update today? The bulk of the discussion will be on Task 3 since we are wrapping up the first draft for Task 4.

Sincerely,
**Amanda J. Harker Steele, Ph.D.** (she/her)
Research Economist – EMAT, SSAE
National Energy Technology Laboratory (NETL)
Department of Energy
3610 Collins Ferry Rd.
Morgantown, WV 26508

Amanda.HarkerSteele@netl.doe.gov
304-285-0207
NATIONAL ENERGY TECHNOLOGY LABORATORY

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Friday, June 16, 2023 8:47 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy R <amy.sweeney@hq.doe.gov>
**Cc:** Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Michael Blackhurst <michael.blackhurst@keylogic.com>; Wallace, Robert T. (CONTR) <Robert.Wallace@NETL.DOE.GOV>
**Subject:** [EXTERNAL] Friday, June 16: FECM LNG Export Project Coordination

Items for today's Task 1 and Task 2 Coordination meeting:

1. Plan for Monday, June 26 FECM Leadership Briefing
2. Check on GCAM and NEMS model handshakes, inputs, outputs, tec.
3. Report Outlines
4. Project Timelines

Any others?

Thanks, Paco

**Francisco De La Chesnaye** | **Vice President**
m: (b) (6) | onlocationinc.com
OnLocation
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**********

**From:** Curry, Thomas
**Sent:** Thu, 31 Aug 2023 14:31:59 +0000
**To:** Scott Matthews; Francisco De La Chesnaye; Iyer, Gokul; Jamieson, Matthew B.
**Cc:** Skone, Timothy; Sweeney, Amy; Lavoie, Brian D.
**Subject:** RE: Context for LCA results

Got it, thanks.

---

**From:** Scott Matthews <scott.matthews@keylogic.com>
**Sent:** Thursday, August 31, 2023 10:25 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** [EXTERNAL] Re: Context for LCA results

Tom: Yes sorry if not clear but on board with the message and all the text you had suggested (only issue was originally the "double negative").

Scott (and Matt)

Scott Matthews | **Principal Scientist**
he/him
m: (b) (6) | keylogic.com
3168 Collins Ferry Rd, Morgantown, WV 26505
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**From:** "Curry, Thomas" <thomas.curry@hq.doe.gov>
**Date:** Thursday, August 31, 2023 at 10:18 AM
**To:** Scott Matthews <scott.matthews@keylogic.com>, Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>, "Iyer, Gokul C" <gokul.iyer@pnnl.gov>, "Jamieson, Matthew B." <matthew.jamieson@netl.doe.gov>
**Cc:** "Skone, Timothy" <timothy.skone@hq.doe.gov>, "Sweeney, Amy" <amy.sweeney@hq.doe.gov>, "Lavoie, Brian D." <brian.lavoie@hq.doe.gov>
**Subject:** RE: Context for LCA results

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thanks, all.

Matt and Scott, are you OK with the other edits related to the interpretation of the MAF? I think we are going to have more work to do to explain it during briefings, etc. but the text below helps me start to get my head around it – if it is correct.

Tom

---

**From:** Scott Matthews <scott.matthews@keylogic.com>
**Sent:** Thursday, August 31, 2023 10:01 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Curry, Thomas <thomas.curry@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** [EXTERNAL] Re: Context for LCA results

All:

Matt and I discussed, and are good with Tom's take on the message, as well as the iteratively improved text this morning.

Our main thought from Tom's initial reply was trying to avoid the double negative ("not inconsistent with"), which I think the iterations have improved, assuming Tom thinks the tweaks are suitable.

Happy to further hone this message as it is critical to the conclusions.

[For perspective, in original text when we said "broadly" it was just meant to be saying "overall", but it was confusing/vague and removing that is an improvement.]

Scott

Scott Matthews | **Principal Scientist**
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m: (b) (6) | keylogic.com
3168 Collins Ferry Rd, Morgantown, WV 26505
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to the message.

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Date:** Thursday, August 31, 2023 at 9:49 AM
**To:** "Iyer, Gokul C" <Gokul.Iyer@pnnl.gov>, "Curry, Thomas" <thomas.curry@hq.doe.gov>, "Jamieson, Matthew B." <matthew.jamieson@netl.doe.gov>, Scott Matthews <scott.matthews@keylogic.com>
**Cc:** "Skone, Timothy" <timothy.skone@hq.doe.gov>, "Sweeney, Amy" <amy.sweeney@hq.doe.gov>, "Lavoie, Brian D." <brian.lavoie@hq.doe.gov>
**Subject:** RE: Context for LCA results

All,

I'm good with Gokul's first suggested edits.

Apologies for the statement "Total GHG emissions are lowest in the *S6* scenario due to lower projected costs of renewable energy". I meant to write S5 but that is just in the connect of the S1 to S5 range and maybe too confusing and better to delete.

Paco

**From:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>
**Sent:** Thursday, August 31, 2023 9:43 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Curry, Thomas <thomas.curry@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** RE: Context for LCA results

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Thanks, Paco.

Tom, I think your understanding is consistent with mine that additional U.S. LNG exports are not inconsistent with decarbonization efforts.

I include few edits to Paco's text in blue below.

- In S1 through S5, emissions across scenarios are either really the same (S1, S2, S4, S5) or slightly higher (S3) – see Figure 13. I therefore suggest not saying "GHG emissions do not increase appreciably" and instead say "GHG emissions do not change appreciably"
- Note that the statement "Total GHG emissions are lowest in the *S6* scenario due to lower projected costs of renewable energy" is not true and I suggest deleting it.

Gokul

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Thursday, August 31, 2023 9:02 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Iyer, Gokul C <Gokul.Iyer@pnnl.gov>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** RE: Context for LCA results

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Tom et al (and adding Gokul),

See responses below, Paco.

In the **Exec Summary**, the current GHG insight is, here is a proposed edit:

> "Third, even though U.S. LNG export continue to grow beyond existing and planned nameplate capacity across scenarios *S1* through *S5*, global and U.S. GHG emissions do not change ~~increase~~ appreciably. GHG emissions in the climate mitigation scenarios, namely, *S6* and *S7* are lower than the others as they are constrained by design. The Life Cycle Analysis, estimating market adjustment factors, also is consistent in indicating that the consequences of increasing U.S. LNG exports broadly do not lead to increased global GHG emissions."

This is a stronger and more robust statement supported by the data.

In the **Section V. Results, E. Global primary energy consumption and greenhouse gas emissions across all scenarios**

Overall, the seven scenarios explored in this study result in a range of outcomes for global energy consumption and emissions by 2050 (Figure 13). The fuel composition of primary energy consumption and the sectoral allocation of GHG emissions are relatively similar across scenarios *S1* through *S5*. Total primary energy consumption and GHG emissions are the highest under the *S3* scenario driven by higher population growth and associated increases in energy demand. ~~Total GHG emissions are lowest in the *S6* scenario due to lower projected costs of renewable energy.~~ It is important to note that total emissions in 2050 under scenarios *S1* through *S5* are relatively similar to 2015 levels because these scenarios include current policies and measures to reduce emissions.[11,12] However, total primary energy consumption in 2050 under these scenarios is significantly higher compared to 2015 ~~in these scenarios~~ primarily driven by growing population and economic growth. By contrast, total energy and emissions are lowest in scenarios *S6* and *S7* due to the emission pledges. As described earlier, these scenarios are also characterized by significant changes in the fuel composition of global energy consumption and the deployment of carbon dioxide removal technologies.

Made the above edits to reinforce that emissions differences between S2 to S5 are NOT due to changes in US LNG export but rather different assumptions (population, renewable costs) made in those respective sensitivity cases.

Edits on the interpretation of the "Interpretation of Market Adjustment Factor Results", I offer a few edits and leave the more technical interpretation to my LCA colleagues.

On an IPCC AR6 100-year basis, for S2-S1, the MAF result is approximately -5.3 g $CO_2$e/MJ. For purposes of comparison, NETL has estimated natural gas upstream emissions prior to delivery to a large industrial end user (like an LNG terminal) are 7.4 g $CO_2$e/MJ. The MAF indicates that as U.S. LNG exports increase, the induced global market effects result in an overall reduction in GHG emissions that is about 70% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S.

The MAF result for S7-S6 is about -3 g $CO_2$e/MJ. In a decarbonizing world, the overall reduction in emissions is 56% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S. This is consistent with the idea that as the global economy decarbonizes, the induced global decarbonization benefit of increased U.S. LNG will be less. Overall, both of these results are consistent with the overall GCAM results that increased U.S. exports do not lead to increased global GHG emissions. Global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. The GHG reductions represented by the negative MAF are not so large that U.S. LNG should be regarded as a major global climate reduction strategy but, at the same time, a negative MAF suggests that U.S. LNG is leading to some global decarbonization. A positive MAF would suggest U.S. LNG is leading to overall increased global emissions.

It is important to note that the MAF results are aggregated in relation to estimated future volumes of exported LNG from the U.S. in the context of a global model. They represent overall expected effects and not those of individual shipments or authorizations of LNG. It is not possible to conclude that every MJ of exported LNG from domestic gas sources would directly lead to the lower GHG emissions results suggested by the MAF.

---

**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Wednesday, August 30, 2023 6:33 PM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>
**Cc:** Skone, Timothy <timothy.skone@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Lavoie, Brian D. <brian.lavoie@hq.doe.gov>
**Subject:** Context for LCA results

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Team,

I'm trying to get my head around the LCA comparison. I don't think the results of the LCA or of GCAM suggest "U.S. LNG exports broadly lead to decarbonization in the global economy." Rather, I think we have found that exports support or at least are not inconsistent with decarbonization efforts. That is, global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. You should tell me if I'm off base with that conclusion.

Here is an attempt at redrafting the "Interpretation of Market Adjustment Factor Results" section of the LCA chapter, I think the comparison of the MAF for S2-S1 and the MAF for S7-S6 is a potentially important finding, if I've interpreted it correctly:

On an IPCC AR6 100-year basis, for S2-S1, the MAF result is approximately -5.3 g $CO_2$e/MJ. For purposes of comparison, NETL has estimated natural gas upstream emissions prior to delivery to a large industrial end user (like an LNG terminal) are 7.4 g $CO_2$e/MJ. The MAF indicates that as U.S. LNG exports increase, the induced global market effects result in an overall reduction in emissions that is about 70% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S.

The MAF result for S7-S6 is about -3 g $CO_2$e/MJ. In a decarbonizing world, the overall reduction in emissions is 56% of the estimated upstream emissions associated with production through delivery of the natural gas to a large industrial end user in the U.S. This is consistent with the idea that as the global economy decarbonizes, the induced global decarbonization benefit of increased U.S. LNG will be less.

Overall, both of these results are consistent with the overall GCAM results that increased U.S. exports support, or at least are not inconsistent with, global decarbonization efforts. Global emissions are constant to slightly negative as U.S. natural gas exports increase and global energy demand increases. The greenhouse gas reductions represented by the negative MAF are not so large that U.S. LNG should be regarded as a major global climate reduction strategy but, at the same time, a negative MAF suggests that U.S. LNG is leading to some global decarbonization. A positive MAF would suggest U.S. LNG is leading to overall increased global emissions.

It is important to note that the MAF results are aggregated in relation to estimated future volumes of exported LNG from the U.S. in the context of a global model. They represent overall expected effects and not those of individual shipments or authorizations of LNG. It is not possible to conclude that every MJ of exported LNG from domestic gas sources would directly lead to the lower GHG emissions results suggested by the MAF.

Tom Curry
Director, Division of Policy and Analysis
Office of Resource Sustainability
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**From:** Rogers, John D.
**Sent:** Wed, 29 Mar 2023 12:57:04 +0000
**To:** Gerdes, Kristin (NETL); Curry, Thomas; Jamieson, Matthew B.; Harker-Steele, Amanda J (NETL)
**Cc:** Sweeney, Amy; Morreale, Bryan (NETL); Gerdes, Kirk (NETL); Richardson, Steven (NETL); Whyte, Cliff (NETL); Hakala, Alexandra (NETL); Balash, Peter (NETL); Adder, Justin (NETL); Dale, Evelyn (NETL); Johnson, Sarah B (CONTR); Cunha, Luciane B (NETL); Nunez-Lopez, Vanessa; Provenzano, Anthony (NETL)
**Subject:** RE: Updated LNG Regulatory Analysis Support FWP - Ready for HQ Signature
**Attachments:** RE: Updated LNG Regulartory Analysis Support FWP - Ready for HQ Signature, FW: Updated LNG Regulatory Analysis Support FWP - Ready for HQ Signature, FW: Updated LNG Regulatory Analysis Support FWP - Ready for HQ Signature, NETL RIC EY22_23 LNG Analysis FWP 1025016_20230112_Update 1_RIC.pdf

Kristin, The $245k is coming from EPS HQ5% discretionary funding as per Venessa Nunez-Lopez. I asked Anthony P. (very late ET) yesterday 3/28 to BD the $245k.

Venessa, Can you send Guidance letter for the $245k or Tom whoever is handling this but I suppose it is Venessa since it is the EPS (ART) funds that is funding it.

Kristin and Anthony can you check to see if your received FY23 $67507 funds I don't know if we ever got those funds and BD them as that was the time all the ART B&R funds were being changed and funds were transferred to NETL and then rescinded. If not we need the $67507 from HQ out of FY23 funds also.

Regards
John

John D Rogers, PhD, PE
Technology Manager ART
S&T Strategic P&P USDOE/NETL
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(b) (6)
Briar Hills One, Ste. 309
1011 Highway 6 South, Houston, Tx 77077
NATIONAL ENERGY TECHNOLOGY LABORATORY

---

**From:** Gerdes, Kristin J. <Kristin.Gerdes@NETL.DOE.GOV>
**Sent:** Wednesday, March 29, 2023 7:33 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Cc:** Sweeney, Amy R <amy.sweeney@hq.doe.gov>; Morreale, Bryan D.

<Bryan.Morreale@NETL.DOE.GOV>; Gerdes, Kirk R. <Kirk.Gerdes@NETL.DOE.GOV>; Richardson, Steven W. <Steven.Richardson@NETL.DOE.GOV>; Whyte, Cliff D. <Cliff.Whyte@NETL.DOE.GOV>; Hakala, Jacqueline Alexandra <Alexandra.Hakala@NETL.DOE.GOV>; Balash, Peter C. <Peter.Balash@NETL.DOE.GOV>; Adder, Justin M. <Justin.Adder@NETL.DOE.GOV>; Dale, Evelyn H. <Evelyn.Dale@NETL.DOE.GOV>; Johnson, Sarah B (CONTR) <Sarah.Johnson@NETL.DOE.GOV>; Rogers, John D. <John.Rogers@netl.doe.gov>; Cunha, Luciane B. <Luciane.Cunha@netl.doe.gov>
**Subject:** RE: Updated LNG Regulatory Analysis Support FWP - Ready for HQ Signature

Hello Tom, Could you please share the funding letter when ready and/or advise whether additional programs will be funding this FWP given this added task (to date we have received EPS funding for this FWP)?

The program funding types impacts some of our internal systems and in knowing it we can make sure the appropriate technology manager is aware and prepared to budget direct the funding to RIC.

Kristin

---

**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Tuesday, March 28, 2023 9:05 AM
**To:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>
**Cc:** Sweeney, Amy R <amy.sweeney@hq.doe.gov>; Morreale, Bryan D. <Bryan.Morreale@NETL.DOE.GOV>; Gerdes, Kirk R. <Kirk.Gerdes@NETL.DOE.GOV>; Gerdes, Kristin J. <Kristin.Gerdes@NETL.DOE.GOV>; Richardson, Steven W. <Steven.Richardson@NETL.DOE.GOV>; Whyte, Cliff D. <Cliff.Whyte@NETL.DOE.GOV>; Hakala, Jacqueline Alexandra <Alexandra.Hakala@NETL.DOE.GOV>; Balash, Peter C. <Peter.Balash@NETL.DOE.GOV>; Adder, Justin M. <Justin.Adder@NETL.DOE.GOV>; Dale, Evelyn H. <Evelyn.Dale@NETL.DOE.GOV>; Johnson, Sarah B (CONTR) <Sarah.Johnson@NETL.DOE.GOV>; Rogers, John D. <John.Rogers@netl.doe.gov>; Cunha, Luciane B. <Luciane.Cunha@netl.doe.gov>
**Subject:** RE: Updated LNG Regulatory Analysis Support FWP - Ready for HQ Signature

Thank you, Matt and Amanda. Please see attached.

Tom

---

**From:** Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>
**Sent:** Thursday, March 23, 2023 3:59 PM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Sweeney, Amy <amy.sweeney@hq.doe.gov>; Harker-Steele, Amanda J (NETL) <amanda.harkersteele@netl.doe.gov>; Morreale, Bryan (NETL) <bryan.morreale@netl.doe.gov>; Gerdes, Kirk (NETL) <kirk.gerdes@netl.doe.gov>; Gerdes, Kristin (NETL) <kristin.gerdes@netl.doe.gov>; Richardson, Steven (NETL) <steven.richardson@netl.doe.gov>; Whyte, Cliff (NETL) <cliff.whyte@netl.doe.gov>; Hakala, Alexandra (NETL) <alexandra.hakala@netl.doe.gov>; Balash, Peter (NETL) <peter.balash@netl.doe.gov>; Adder, Justin (NETL) <justin.adder@netl.doe.gov>; Dale, Evelyn (NETL) <evelyn.dale@netl.doe.gov>; Johnson, Sarah B (CONTR) <Sarah.Johnson@NETL.DOE.GOV>; Rogers, John D. <John.Rogers@netl.doe.gov>; Cunha, Luciane B (NETL) <luciane.cunha@netl.doe.gov>
**Subject:** Updated LNG Regulartory Analysis Support FWP - Ready for HQ Signature

Please find attached the revised NETL Research and Innovation Center Field Work Proposal for providing LNG Regulatory Support updated with Task 3, Life Cycle Analysis support.

Respectfully, please sign the cover page and email the signed FWP back to NETL (Amanda Harker-Steele and Matt Jamieson) at your earliest convenience.

Respectfully,

Matt Jamieson
Department of Energy National Energy Technology Laboratory
Strategic Systems Analysis & Engineering
Senior Life Cycle Analyst
412.386.7610 (direct) | (b) (6) (mobile)

**From:** Curry, Thomas
**Sent:** Tue, 16 May 2023 16:56:09 +0000
**To:** Francisco De La Chesnaye; Iyer, Gokul; Skone, Timothy; Jasmine Greene; Whitman, Peter C
**Cc:** Harker-Steele, Amanda J (NETL); Sweeney, Amy; Edmonds, James A (Jae)
**Subject:** Re: LNG Project Coordination on Reports and Timeline

Thanks, Paco. I'm returning to the office from an in person meeting and will be a few minutes late. I would encourage you to get started with Tim and/or Amy when they join.
**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Tuesday, May 16, 2023 12:41:19 PM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>; Jasmine Greene <jasmine.greene@onlocationinc.com>; Whitman, Peter C <peter.whitman@onlocationinc.com>
**Cc:** Harker-Steele, Amanda J (NETL) <amanda.harkersteele@netl.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>
**Subject:** [EXTERNAL] LNG Project Coordination on Reports and Timeline

All,

Please see drafts of outlines for the eventual "Docket" report and Modeling and Analysis Report that we will need to write and support as deliverables for the LNG Export project. These are based on the lasts couple of docket submission and modeling.
There is also a "working schedule" to review.

Will go over this later today at 1 pm.

Best, paco

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**From:** Curry, Thomas
**Sent:** Wed, 6 Sep 2023 15:07:42 +0000
**To:** Francisco De La Chesnaye; Sweeney, Amy
**Cc:** Iyer, Gokul; Scott Matthews; Jamieson, Matthew B.; Whitman, Peter C; Skone, Timothy
**Subject:** RE: LNG Export Report

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Thanks all for the quick work on this. I gave it a quick scan and wanted to flag two issues:

- Can you check the formatting associated with the figures on pages 22-27 (figures 4-6)? It looks like some of text got pulled into the title on page 24 and there is an errant "figure 6" in text on page 25.
- We like the summary table in the conclusion but were surprised that residential prices were included for S6-S7. Are those discussed anywhere else in the document? I didn't see them on a quick review. If we are going to have them in the table, we will need to explain them. For this draft, can you include a note at the bottom of the table saying that additional context for S6-S7 residential prices is being developed and will be included in a subsequent draft?

Tom

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Tuesday, September 5, 2023 10:06 PM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Iyer, Gokul <gokul.iyer@pnnl.gov>; Scott Matthews <scott.matthews@keylogic.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** [EXTERNAL] RE: LNG Export Report
**Importance:** High

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Amy and Tom,

The combined team from PNNL, OnLocation, and NETL are pleased to submit the FINAL REVIEW DRAFT of the attached report "ENERGY, ECONOMIC, AND ENVIRONMENTAL ASSESSMENT OF U.S. LNG EXPORTS".

We look forward to successfully completing the FINAL Deliverable soon.

Best, Paco

**Francisco De La Chesnaye** | **Vice President**
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**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Tuesday, September 5, 2023 11:27 AM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Cc:** Iyer, Gokul C <gokul.iyer@pnnl.gov>; Scott Matthews <scott.matthews@keylogic.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jasmine Greene <jasmine.greene@onlocationinc.com>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Subject:** RE: LNG Export Report

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Great! Thanks all for your work over the weekend. We very much appreciate it.

Tom

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Tuesday, September 5, 2023 10:46 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Cc:** Iyer, Gokul <gokul.iyer@pnnl.gov>; Scott Matthews <scott.matthews@keylogic.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jasmine Greene <jasmine.greene@onlocationinc.com>
**Subject:** [EXTERNAL] LNG Export Report

Tom,

We worked over the weekend to address all tenoning comments and complete the report. It is now going through a final technical edit review. We are planning to finish today by COB. I'll give you another status update later today.

Best, Paco

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**Francisco De La Chesnaye | Vice President**
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**From:** Harker Steele, Amanda J.
**Sent:** Fri, 11 Aug 2023 15:38:53 +0000
**To:** Francisco De La Chesnaye; Iyer, Gokul; Edmonds, James A (Jae); Binsted, Matthew; Wolfram, Paul; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Skone, Timothy
**Cc:** Curry, Thomas; Yarlagadda, Brinda; Sweeney, Amy; Robert Wallace; Agboola, Ajoke; Jamieson, Matthew B.; Wallace, Robert T. (CONTR); Scott Matthews; Matthews, Howard Scott (CONTR)
**Subject:** RE: FECM LNG Export Project Coordination

Hi all,

Apologies but I will not be able to attend today's meeting. I need to dedicate this time to planning out the revision schedule and completing the latest revision requests for the Env. Review report. If there are specific questions for me, please let me know. Thank you!

Sincerely,
**Amanda J. Harker Steele, Ph.D.** (she/her)
Research Economist – EMAT, SSAE
National Energy Technology Laboratory (NETL)
Department of Energy
3610 Collins Ferry Rd.
Morgantown, WV 26508
Amanda.HarkerSteele@netl.doe.gov
304-285-0207

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Friday, August 11, 2023 8:53 AM
**To:** Iyer, Gokul C <Gokul.Iyer@pnnl.gov>; Edmonds, James A (Jae) <jae@pnnl.gov>; Binsted, Matthew T <matthew.binsted@pnnl.gov>; Wolfram, Paul <paul.wolfram@pnnl.gov>; Peter Whitman <peter.whitman@onlocationinc.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Jefferson Riera <jefferson.riera@onlocationinc.com>; Skone, Timothy J <timothy.skone@hq.doe.gov>
**Cc:** Curry, Thomas <thomas.curry@hq.doe.gov>; Yarlagadda, Brinda N <brinda.yarlagadda@pnnl.gov>; Sweeney, Amy R <amy.sweeney@hq.doe.gov>; Harker Steele, Amanda J. <Amanda.HarkerSteele@netl.doe.gov>; Robert Wallace <robert.wallace@keylogic.com>; Agboola, Ajoke <ajoke.agboola@hq.doe.gov>; Jamieson, Matthew B. <Matthew.Jamieson@NETL.DOE.GOV>; Wallace, Robert T. (CONTR) <Robert.Wallace@NETL.DOE.GOV>; Scott Matthews <scott.matthews@keylogic.com>; Matthews, Howard Scott (CONTR) <Scott.Matthews@netl.doe.gov>
**Subject:** [EXTERNAL] FECM LNG Export Project Coordination

DRAFT – DELIBERATIVE – PRE-DECISIONAL

All,

For today's coordination meeting, I have the following proposed items to cover:

1. Final check on analysis and results for GCAM and NEMS with a focused discussion on comparison between S6 and S7
2. Update on the Task 3 - LCA
3. Review of Report Schedule
4. Planning for DOE cross office and leadership briefings on final results

Please advise if other items should be added to today's meeting.

Thanks, Paco

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**From:** Sweeney, Amy
**Sent:** Fri, 25 Aug 2023 02:56:42 +0000
**To:** Curry, Thomas; Francisco De La Chesnaye
**Cc:** Yarlagadda, Brinda; Jamieson, Matthew B.; Scott Matthews; Daniel Hatchell; Iyer, Gokul; Binsted, Matthew; Whitman, Peter C; Riera, Jefferson; Skone, Timothy
**Subject:** RE: FECM LNG Export Draft Report

Yes – Paco and all of the team, I know this is the culmination of a very large multi-month effort and while I know there are still miles to go, want to thank you for all the tremendous work that has gone into this. Looking forward to further review and next steps.

Amy

---

**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Thursday, August 24, 2023 5:06 PM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Yarlagadda, Brinda <brinda.yarlagadda@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Binsted, Matthew <matthew.binsted@pnnl.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Riera, Jefferson <jefferson.riera@onlocationinc.com>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: FECM LNG Export Draft Report

DRAFT/DELIBERATIVE/PRE-DECISIONAL

Thank you, Paco and all. We look forward to reviewing this draft.

Tom

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Thursday, August 24, 2023 3:53 PM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Yarlagadda, Brinda <brinda.yarlagadda@pnnl.gov>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Scott Matthews <scott.matthews@keylogic.com>; Daniel Hatchell <daniel.hatchell@onlocationinc.com>; Iyer, Gokul <gokul.iyer@pnnl.gov>; Binsted, Matthew <matthew.binsted@pnnl.gov>; Whitman, Peter C <peter.whitman@onlocationinc.com>; Riera, Jefferson <jefferson.riera@onlocationinc.com>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** [EXTERNAL] FECM LNG Export Draft Report
**Importance:** High

DRAFT/DELIBERATIVE/PRE-DECISIONAL

Dear Tom and Amy,

Ahead of tomorrow's meeting, please find attached the latest draft of the report titled "ENERGY, ECONOMIC, AND ENVIRONMENTAL ASSESSMENT of U.S. LNG EXPORTS". It contains the most current results under Task 1 and 2 from the PNNL and OnLocation teams. We have left room for the Task 3 LCA Analysis which can be incorporated as soon as it is completed.

Many thanks for all the hard work from the PNNL and OnLocation staff to get the project to this point (Gokul, pls forward as appropriate to others at PNNL).

We look forward to the review from FECM and to clearly laying out key next steps to finalize the full report.

Best, Paco

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**From:** Francisco De La Chesnaye
**Sent:** Thu, 31 Aug 2023 16:56:46 +0000
**To:** Francisco De La Chesnaye; Scott Matthews; Whitman, Peter C; Daniel Hatchell; Riera, Jefferson; Iyer, Gokul; Binsted, Matthew
**Cc:** Jamieson, Matthew B.; Skone, Timothy; Curry, Thomas; Sweeney, Amy
**Subject:** Hold for LNG Export Report Review

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**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Thursday, August 31, 2023 12:01 PM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Iyer, Gokul C <gokul.iyer@pnnl.gov>; Scott Matthews <scott.matthews@keylogic.com>; Peter Whitman <peter.whitman@onlocationinc.com>; Jamieson, Matthew B. <matthew.jamieson@netl.doe.gov>; Skone, Timothy <timothy.skone@hq.doe.gov>
**Subject:** RE: new plan - you send the updated draft

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DRAFT – DELIBERATIVE – PRE-DECISIONAL

Hi Paco and all,

Thank you for the hard work pulling together a solid draft. Attached is a draft that Amy and I reviewed along with the natural gas regulatory team. Many of our edits and comments are suggestions for improving the flow and consistency of the report. There are a few I want to call out:

- We have tried to simplify the executive summary and the insights. We moved the longer insights to a conclusion section. My recommendation is that we iterate on the executive summary insights and then revise the conclusions to make sure everything is reflected there.
- The regulatory team is confused by aspects of the nomenclature in the scenario descriptions:
  - The use of capacity in "Reference Capacity" would be better named "Reference Exports" since capacity can be higher than what is actually exported. EIA also refers to exports as opposed to capacity.
  - "Economic solution" it being misinterpreted as something DOE, or the modeling team has imposed on the model. We do not want to go back to language about removing a constraint. You will see in a comment, Brian has suggested "economic equilibrium solution" or "market equilibrium level" if those might work.
  - The abbreviations on S6 and S7 "Mark Resp" and "Ref Cap" are also causing confusion. There is a suggestion to define them, which I think is good but there is also a question why all the scenarios don't have that notation. Maybe we can drop "Mark Resp" from S7 and rename S6 "Energy Transition (Ref Exp)"? Since all the others are market response, the definition on S7 is redundant.
  - In general, the team liked Table 2 – maybe we should move that table up to the Exec Summary?
- While we did not focus on the market impacts from NEMS during the modeling meetings, those are a significant focus of the regulatory team. It would be helpful if we could include sentences throughout that section that highlight the results (e.g., S2 is X% higher than S1).
- Where possible, we would like to include percent differences or ranges to provide context for statements like "slightly higher" or "moderately different". Having numbers is helpful for the regulatory team.
- I was surprised that S7 has lower natural gas prices than S6 – I recognize it is in the noise, but do we have an explanation for this? Is the gas coming from different basins?

We would like to circulate a revised draft to GC and others early next week, can you review the edits and feedback and give us an estimate for coming back with a revised draft?

Thank you. I'm happy to jump on the phone any time to discuss. We can also have further discussion during our regular call tomorrow at noon.

Tom

---

**From:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Sent:** Wednesday, August 30, 2023 6:46 AM
**To:** Curry, Thomas <thomas.curry@hq.doe.gov>; Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Cc:** Iyer, Gokul <gokul.iyer@pnnl.gov>; Scott Matthews <scott.matthews@keylogic.com>; Whitman, Peter C <peter.whitman@onlocationinc.com>

**Subject:** [EXTERNAL] RE: new plan - you send the updated draft
**Importance:** High

DRAFT – DELIBERATIVE – PRE-DECISIONAL

Tom and Amy,

Please find attached the most current final draft of the LNG Report that better incorporates the LCA Analysis with the GCAM and NEMS Analyses.

We will wait to get you response before processing further on the report.

Best, Paco

**Francisco De La Chesnaye | Vice President**
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**From:** Curry, Thomas <thomas.curry@hq.doe.gov>
**Sent:** Tuesday, August 29, 2023 4:45 PM
**To:** Francisco De La Chesnaye <francisco.delachesnaye@onlocationinc.com>
**Cc:** Sweeney, Amy <amy.sweeney@hq.doe.gov>
**Subject:** new plan - you send the updated draft

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Hi Paco,

I had only seen my comments, but others on the regulatory team have comments in locally saved versions of the report. If you send us the new version of the report as soon as possible, we will review it and add our comments to that draft. We have an internal meeting scheduled for tomorrow at 11:30am – if you can get it to us before that time, that would be ideal.

Tom

Tom Curry
Director, Division of Policy and Analysis
Office of Resource Sustainability
thomas.curry@hq.doe.gov
Tel: 202-586-5950
Cell: (b) (6)




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