Comments on EPA's Proposed Repeal of Greenhouse Gas Emissions Standards from Fossil Fuel-Fired Electric Generating Units Docket 40 CFR Part 60, EPA-HQ-OAR-2025-0124; FRL-12674-01-OAR, RIN 2060-AW55

Government Accountability & Oversight
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SUMMARY OF COMMENTS:

COMMENT: *The 2024 Clean Power Standard is unlawfully based on a premise that was* demonstrably *false at the time of proposal and promulgation, specifically that "carbon capture" (CCS) had been "adequately demonstrated" as a best system of emission reduction.*

COMMENT: *The 2024 Clean Power Standard is improperly based on a premise that was* knowingly *false at the time of proposal and promulgation, specifically that "carbon capture" (CCS) had been "adequately demonstrated" as a best system of emission reduction.*

COMMENT: *The 2024 Clean Power Standard is based on an incomplete and inaccurate rulemaking record: EPA excluded from the administrative record information in its possession that was directly relevant and material, indeed dispositive of a key Agency claim regarding "carbon capture" (CCS) having been "adequately demonstrated," which information was provided to the Agency by federal officials whose input the Agency solicited, but which contradicted claims made in the pre-proposal and later the proposed and promulgated standard.*

GAO Comment Summary

Government Accountability & Oversight, a 501c3 non-profit public policy group dedicated to educating on governmental policy and operations, particularly those in and effecting the areas of energy and environmental policy, appreciates the opportunity to provide comments in response to your Proposed Repeal of Greenhouse Gas Emissions Standards for Fossil Fuel-Fired Electric Generating Units, https://www.federalregister.gov/documents/2025/06/17/2025-10991/repeal-of-greenhouse-gas-emissions-standards-for-fossil-fuel-fired-electric-generating-units ("Proposed Repeal"), in which you encouraged interested parties to submit detailed comments.

The Proposed Repeal seeks, in part, to rescind greenhouse gas (GHG) emission standards including as set forth in the 2024 "Carbon Pollution Standards" ("New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule; Final Rule," 89 FR 39798 (May 9, 2024)," (hereafter "CPS")).

GAO writes to ensure the record reflects a fatal problem with CPS, including specifically how it violated the Clean Air Act, the right to due process, and the Administrative Procedure Act, as stated in the above Comments and supported in the background, below, with citation to certain information in the federal government's and (GAO states on information and belief) the

Agency's custody documenting the above. GAO therefore also incorporates into the Proposal's record excerpts from those records.

In part by this Proposed Repeal, the EPA is undoing years of policies that targeted ideologically disfavored activities sometimes by whatever means necessary. Where appropriate, as here, the Agency should acknowledge that its predecessors broke the law to get their way, including as documented below.

GAO strongly encourages the EPA to repeal the CPS, and to confess that it was adopted through a flawed process based upon an incomplete and inaccurate administrative record.

Introductory Background

Although the EPA has the authority to regulate, it cannot regulate the way it has. The authority for administrative agencies to regulate is provided by Congress. To be valid, any regulatory process must adhere to the prescribed procedure, considering constitutional constraints and their manifestation in the Administrative Procedure Act (APA), or in identical constraints rising from the CAA itself. Due to these restraints, if the record is tainted, either by officials who sought a predetermined outcome or had conflict of interest, officials who improperly colluded behind the scenes thereby granting certain parties a uniquely influential role in the process (inherently to the detriment of other parties), or if the record is incomplete or presumptively so, then the rulemaking is invalid and must be rescinded.

The statute governing this rulemaking, the Clean Air Act (CAA)(42 U.S.C § 7401 *et seq*.), requires that when the EPA establishes or revises a performance standard, it must "reflect[ ] the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." CAA section 111(a)(1). Thus, the term "standard of performance" as used in CAA section 111 makes clear that the EPA must determine both the "best system of emission reduction . . . adequately demonstrated" (BSER) for emissions of the relevant air pollutants by regulated sources in the source category and the "degree of emission limitation achievable through the application of the [BSER]." *West Virginia* v. *EPA,* 597 U.S. 697, 709 (2022).

To determine the BSER, the EPA first identifies the "system[s] of emission reduction" that are "adequately demonstrated," before proceeding to those other considerations. The EPA then derives from that system an "achievable" "degree of emission limitation." The EPA must then, under CAA section 111(b)(1)(B), promulgate "standard[s] for emissions" that reflect that level of stringency. The EPA may determine that different sets of sources have different characteristics relevant for determining the BSER for emissions of the relevant air pollutants and may subcategorize sources accordingly. CAA section 111(b)(2).

The CAA also reads in pertinent part, "The promulgated rule may not be based (in part or whole) on any information or data which has not been placed in the docket as of the date of such promulgation." 42 U.S.C. § 7607 (d)(6)(c). A rule can be invalidated if it is "found to be— (A) arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; (B) contrary to constitutional right, power, privilege, or immunity; (C) in excess of statutory jurisdiction, authority, or limitations, or short of statutory right; or (D) without observance of procedure required by law…." 42 U.S.C. § 7607 (d)(6)(c).

The arbitrary and capricious standard, as it applies to the CAA, has been explained more thoroughly by the 11th Circuit Court of Appeals in *Louisiana-Pacific Corp. v. United States EPA* which, citing to the U.S. Supreme Court, held that "[A]n agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."[1] In another case relevant to this rulemaking, in *Association of Nat'l Advertisers, Inc. v. FTC*, the D.C. Circuit Court of Appeals explained that agency officials should not participate in such proceedings if they have "an unalterably closed mind on matters critical to the disposition of the rulemaking."[2]

The result of the applicable precedent is that a rule cannot stand if an agency has based a rule on information not on the record, or if the decision is materially based on involvement by an individual having an "unalterably closed mind." GAO possesses, and cite in this Comment, substantial reason to believe this proposed rule is based on information not in the record— at minimum, the Agency's record plainly is *presumptively* deficient, for reasons explained herein— is arbitrary, capricious, and an abuse of discretion and otherwise not in accordance with the law, that it may have violated the due process and equal protection rights of various interested parties, was therefore inherently promulgated with material participation by officials whose minds were unalterably made up (as the sole reasonable explanation for ignoring the information proffered to the Agency and cited, below), and has failed to observe legally required procedure.

The result is that the CPS rulemaking is invalid. As the CPS rulemaking record is tainted and/or deficient for these reasons, the CPS is invalid, and irreparably so, it should be repealed.

Context for the Proposed Repeal and these Comments

The Rule proposed for rescission, CPS, was imposed with the intent to eliminate most fossil-fuel electricity generation in the United States, particularly by forcing premature retirement of politically disfavored but functioning, economic and reliable generation sources.[3] Seven weeks after then-Administrator Michael Regan publicly admitted (indeed boasted) of this objective[4], the

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[1] *Louisiana-Pacific Corp. v. United States EPA*, 281 Fed. Appx. 877, 878 (11th Cir. 2008) (citing *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co*., 463 U.S. 29, 43 (1983)).

[2] *Association of Nat'l Advertisers, Inc. v. FTC*, 627 F.2d 1151, 1154 (D.C. Cir. 1979).

[3] See, e.g., Editorial, "An EPA Death Sentence for Fossil-Fuel Power Plants: The Biden agency's new rule means the end of natural gas-fueled electricity," *Wall Street Journal*, May 11, 2023, https://www.wsj.com/business/energy-oil/power-plants-environmental-protection-agency-rule-epa-biden-administration-fossil-fuels-60f06bd0?st=pw6kne&reflink=desktopwebshare_permalink.

[4] See, e.g., Jean Chemnick and Mike Lee, "What the EPA's New Plans for Regulating Power Plants Mean for Carbon," *Scientific American*, March 11, 2023, https://www.scientificamerican.com/article/what-the-

Supreme Court admonished the EPA in *West Virginia v. EPA*, 42 S. Ct.2587 (2022) that forcing generation-shifting from coal or gas to renewables, what it called "deciding how Americans will get their energy," was not within the Agency's authority.

Assuming EPA could design an otherwise legal GHG standard, the Court ruled, there must be some way to meet it short of plant closure.

Notwithstanding this clear holding, the Agency proceeded to regulate with the CPS, and the rest of the "suite of standards"[5] that Mr. Regan had simultaneously announced as his means of forcing generation shifting. But it did so without reference to or acknowledgement of the previously admitted approach—which other records affirm[6] and which would have led to further rulings against the Agency striking down each of these rules under, *inter alia*, *West Virginia*.[7]

epas-new-plans-for-regulating-power-plants-mean-for-carbon/ ("The industry gets to take a look at this suite of rules all at once and say, 'Is it worth doubling down on investments in this current facility or operation, or should we look at the cost and say no, it's time to pivot and invest in a clean energy future?" Regan told reporters after his keynote address. "If some of these facilities decide that it's not worth investing in [control technologies] and you get an expedited retirement, that's the best tool for reducing greenhouse gas emissions," he added."). See also, "Administrator Michael Regan, Remarks to CERAWeek About EPA's Approach to Deliver Certainty for Power Sector and Ensure Significant Public Health Benefits, As Prepared for Delivery," https://web.archive.org/web/20220503220839/https://www.epa.gov/speeches/administrator-michael-regan-remarks-ceraweek-about-epas-approach-deliver-certainty-power.

[5] https://www.epa.gov/newsreleases/biden-harris-administration-finalizes-suite-standards-reduce-pollution-fossil-fuel. This campaign of using a cascade of rules to force "expedited retirement" of power plants also includes EPA's tightened National Ambient Air Quality Standard for particulate matter, or PM NAAQS. See GAO amicus brief in *Commonwealth of Kentucky, et al v. EPA, et al*. (D.C. Cir. Case #24-1050, Document #2058290, June 6, 2024; EPA-89FR16202, litigation over EPA's "Reconsideration of the National Ambient Air Quality Standards for Particulate Matter," 89 Fed. Reg. 16202 (Mar. 6, 2024)); https://govoversight.org/wp-content/uploads/2024/04/24-1050_Documents-GAO-Motion-and-Brief.pdf.

[6] See, Chris Horner, "EPA's Deceptive Climate Regulations Won't Stand in Court," *Wall Street Journal*, May 1, 2024, https://www.wsj.com/opinion/bidens-climate-deception-wont-stand-in-court-suite-west-virginia-pretext-regan-0fae5111; Chris Horner, "The EPA Defies the Supreme Court," *Wall Street Journal*, Aug. 17, 2023, https://www.wsj.com/opinion/epa-environmental-protection-supreme-court-regulation-unconstitutional-climate-change-administrative-state-biden-42f31ce3; "Law Whispering is Dead. Long Live Law Whispering!," February 28, 2023, https://govoversight.org/law-whispering-is-dead-long-live-law-whispering/, and Power Point slide show linked therein, at https://govoversight.org/wp-content/uploads/2023/02/October-2022-Release-ED_006414_00000550_Formal_RWR.pdf.

[7] In fact, to the extent the "suite of rules" of which CPS was a part spoke to "generation shifting" they denied that this would be a result of the rules. Gone were the Agency paeans to inventively coercing plants to retire. With a newfound modesty and apparent complete reversal of its projected impacts, the administrative record published for these non-GHG rules disputed claims of causing "a significant number of retirements" (https://www.epa.gov/system/files/documents/2024-04/6716-3_2060-av53_mats_rtr_20240417_admin.pdf) and attributed any generation shifting to "Inflation Reduction Act" subsidies (https://www.epa.gov/system/files/documents/2024-04/prepublication_ow_supplemental-steam-electric-elg_final_frn_20240422_admin.pdf). As such, the administrative records' silence on the rules' true purpose shielded these rules from scrutiny of another related and fatal impropriety, which is the

This history is of critical importance to EPA's premise for the CPS, which suggests the Agency fabricated the basis for its flagship 2024 Carbon Pollution Standards. Internal government records bear this out, but those records were improperly excluded from the administrative record by the same process and, likely, officials who proposed the improper regulations.

DoE Input on CCS: Another 'Body' Buried

All three comments cited at the outset, *supra*, refer to EPA's alternate basis for its Proposed Repeal of the GHG emission standards for stationary sources: the EPA may have adopted a false premise that carbon capture and storage technology, or CCS, had been "adequately demonstrated" as a BSER and an (indeed, the only) alternative means of complying with the CPS other than to simply shutting down power generation facilities.

The Proposed Repeal establishes that the Agency should have known its claims in the CPS about CCS's viability were unfounded, leaving CCS or generation-shifting as the only options to comply with the emission-reduction standard. However, documents obtained by Government Accountability & Oversight confirm that the Agency had been informed of the true, unproven state of CCS technology, which advice it buried.

While shocking, this is not surprising. When it came to the climate agenda, the previous administration's agencies became burial grounds for internal advice that ran counter to the plan.[8]

For example, as reported by the *Wall Street Journal* in October of last year, the Department of Energy (DoE) conducted a study in 2023 on the economic and environmental impacts of liquified natural gas exports.[9] The conclusions did not support restraining exports as activists demanded.[10] Thus the assessment was concealed, and further exports were nonetheless "paused" in January 2024 on the false premise that the Department would "initiate" a study of the matter.[11]

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pretext confessed to in public by the Agency's then-Administrator quoted above. As such, CPS (and indeed each of the same "suite of rules") violates the rule against pretext, as reaffirmed by the Supreme Court in *Department of Commerce v. New York*, 139 S. Ct. 2551 (2019) (remanding a rule where the evidence tells a story that does not match the secretary's explanation for his decision).

[8] See, e.g., https://govoversight.org/bookmark-this-buried-biden-admin-bombshell-2-0/.

[9] Editorial, "The Harris Disguise, Energy Edition," *Wall Street Journal*, October 24, 2024, https://www.wsj.com/opinion/kamala-harris-fracking-energy-camila-thorndike-climate-policy-b768a9ce?st=quRDks&reflink=desktopwebshare_permalink.

[10] See, e.g., Benoit Morenne and Andrew Restuccia, "How the Rockefellers and Billionaire Donors Pressured Biden on LNG Exports," *Wall Street Journal*, February 8, 2024, https://www.wsj.com/us-news/climate-environment/how-the-rockefellers-and-billionaire-donors-pressured-biden-on-lng-exports-c1bf0ff8.

[11] https://www.energy.gov/articles/doe-update-public-interest-analysis-enhance-national-security-achieve-clean-energy-goals.

Thanks to Freedom of Information Act (FOIA) litigation[12], DoE admitted to the 2023 assessment's existence and ultimately released the documents. Secretary Chris Wright acknowledged this in the Spring of this year[13] and reversed the Biden policy, citing to a review of "the complete record."[14]

The same opportunity and also necessity exists for the EPA, with DoE experts once again at the center of the story. Emails[15] and other documents[16] reveal that on March 16, 2023, EPA sought DoE's input on the draft CPS. The Department's appraisal provided to EPA in response defenestrated the claim that carbon capture was "adequately demonstrated." See, *infra*.

EPA claimed then, and in the final CPS, that the technology was shown to be fit for purpose by the supposed success of an experimental project of Canada's SaskPower, called Boundary Dam 3. Yet in addition to their own analysis, DoE career staff pointed to SaskPower's publicly available confessions of dismal performance. This exposed the CPS's false premise, but as with the 2023 LNG study these comments never emerged in the CPS administrative record.

Other evidence of the violation set forth here does exist despite that the administrative record was curated to exclude vital, problematic comments. For example, while referring only to "redacted documents produced by EPA" to the House Committee on Oversight and Reform, Chairman James Comer sent a December 2023 letter to then-EPA administrator Michael Regan about the GHG rule, asking to "unmask internal Biden Administration comment authorship."[17] The documents as quoted in the letter indicate knowledge by several internal commenters of the CCS falsehood. This pursuit was checked by a lack of administration cooperation.

EPA proceeded to adopt its CPS which depended entirely on the false claim, rebutted by DoE's comments, that CCS was "adequately demonstrated." The Agency should review the relevant history. A story re-posted by Administrator Zeldin indicates an understanding that reviewing the complete record, as did Secretary Wright with respect to the LNG "pause,"[18] is a responsible step in reconsidering any prior action.

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[12] See, generally, *GAO v. Dep't of Energy*, 24-1829, 24-1887, 24-926, 24-1957, 24-2027, 24-2039, 24-2077, 24-2099, 24-3500 (DDC), discussed at https://govoversight.org/?s=pause.

[13] https://x.com/SecretaryWright/status/1902455546361294867.

[14] https://www.energy.gov/articles/doe-finalizes-2024-lng-export-study-paving-way-stronger-american-energy-exports.

[15] https://govoversight.org/wp-content/uploads/2025/06/OCRd-FW-EO-12866-inter-agency-review-EPA-OAR-CAA-111-GHG-Emissions-NSPS-and-EGs-ACE-repeal-RINs-2060-AV09-and-2060-AV10.pdf.

[16] https://govoversight.org/wp-content/uploads/2025/06/DoE-COMMENTS-IN-EO-12866_111-EGU_2060-AV09-and-2060-AV10_NPRM_Preamble_ANON.pdf.

[17] https://oversight.house.gov/wp-content/uploads/2023/12/Letter-to-EPA-Unmasking-Comments.pdf.

[18] *See*, "FOIA'd docs expose, as we've been saying, the Biden EPA "gold bars" scheme was riddled with self-dealing and conflicts of interest, unqualified recipients, and reduced oversight. An honest person might even call this sourced documentation "evidence"." X.com post by Administrator Lee M. Zeldin, May 11, 2025, https://x.com/epaleezeldin/status/1921726467534131221.

The CPS is premised on a claim that CCS had been “adequately demonstrated.” Examples include, that, e.g., “a range of cost-effective technologies and approaches to reduce GHG emissions from these sources is available to the power sector—including carbon capture and sequestration/storage (CCS), co-firing with less GHG-intensive fuels, and more efficient generation”; that “CCS is the BSER for certain subcategories of new and existing EGUs because it is an adequately demonstrated and available control technology that significantly reduces [GHG] emissions”; and that “Commenters stated that that all constituent components of CCS—carbon capture, transportation, and sequestration—have not been adequately demonstrated in integrated, simultaneous operation. We disagree with this comment. The record described in the preceding shows that all components have been demonstrated simultaneously. Even if the record only included demonstration of the individual components of CCS, the EPA would still determine that CCS is adequately demonstrated as it would be reasonable on a technical basis that the individual components are capable of functioning together—they have been engineered and designed to do so, and the record for the demonstration of the individual components is based on decades of direct data and experience.”[19]

The above is far from an exhaustive list of such assertions of the false premise. Also, the Agency referred, repeatedly and principally, to SaskPower’s Boundary Dam Unit 3 CCS experiment as showing that “technical challenges have been sufficiently overcome or are actively mitigated so that Boundary Dam has more recently been capable of achieving capture rates of 83 percent when the capture plant is online.” Id. This is untrue both generally and in its specifics.[20]

The CPS premise that CCS had been “adequately demonstrated” was made in the pre-proposal sent to the Department of Energy for its input. We refer the Agency to information transmitted to it on March 22, 2023, but regardless on or about March 20-30, 2023, by the Department of Energy (DoE) including/and-or also DoE’s constituent office the National Energy Technology Laboratory (NETL).[21]

This input was provided in response to a March 16, 2023 request to DoE by the EPA for input on the “New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule.” EPA had formally requested comment from DoE on EPA’s soon-to-be-proposed CPS, asking for a near-term response on or about the end of

[19] “New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule; Final Rule,” 89 FR 39798 (May 9, 2024).

[20] The CPS as finalized interwove a premise that CCS had been adequately subsidized so as to be surely available in the future. See, e.g., “90 percent CCS is an adequately demonstrated technology that achieves significant emissions reduction and is cost-reasonable, taking into account the supposedly declining costs of the technology and the IRC section 45Q tax credit available for a certain number of years to generating sources that use CCS technology.” *Id.*

[21] See also Freedom of Information Act request 2025-EPA-06448.

March 2023.[22] The public was later asked to comment on this same issue in May 2023. In that docket select NETL comments also were published but in sanitized form, stripping out the expert engineers' commentary exposing EPA's misrepresentations.

On information and belief, these DoE comments authored by NETL engineers very pointedly explained that carbon capture and sequestration (CCS) was *not*, as EPA had stated, an "adequately demonstrated" technology.

DoE comments addressed EPA claims, first made on page 174-176 of its Preamble, by detailing how the Agency obscured and misrepresented the information released in the SaskPower Boundary Dam reports[23] about the Boundary Dam 3 CCS performance failures.

Also on information and belief, exemplar comments inputted therein include (emphases in original comments):

> The EPA is primarily predicating its determination of CCS technology being "adequately demonstrated" once again based on the performance of the Boundary Dam Unit #3 (BD3) CCS demonstration project performance. This was the approach taken in the October 23, 2015 "*Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units; Final Rule*" (see: https://www.federalregister.gov/documents/2015/10/23/2015-22837/standards-of-performance-for-greenhouse-gas-emissions-from-new-modified-and-reconstructed-stationary) *In this document, BD3 was cited 40 times as operating satisfactorily to enable characterization of the application of retrofitted CCS as BSER and as to qualify as "adequately demonstrated".* EPA missed the significant news of a major equipment malfunction on the CCS portion of the plant, that had become known by the time of the publication of the Federal Register Standards of Performance.
>
> Evidence, as further discussed in comments below, confirms that the ongoing operating performance of the same BD3 demonstration project is being, once again, misconstrued as having provided sufficient justification for claiming satisfactory performance to allow the technology to be considered "adequately demonstrated" and BSER.

Also:

> Over 8¼ years of demonstration (99 months) BD3 has only approached (but did not achieve) 90% capture in two months (January 2016 and October 2017.)

Also:

> This is misleading as the BD3 unit has not demonstrated feasibility of 90 percent capture rates. The average monthly capture rate over 99 months has been approximately 50,600 tonnes per month, or approximately 53.2% of the annual design emissions expectation of

[22] It appears from records we have that EPA likely worked through DoE's Office of General Counsel.

[23] These comments cited to https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q3-2022 and https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-march-2022.

> 1,027,000 tonnes per year. The plant has occasionally exceeded 90% CO_2 capture rates for limited, non-commercial periods of time.

Also:

> This reference to a SaskPower BD3 operations report, dated October 18, 2022, (footnote 226) fails to acknowledge the data provided by SaskPower, in the same report, for the preceding, low-performing 3 quarters, Q3 2021, Q4 2021, and Q1 2022. These three quarters were part of a full year period of 4 quarters, Q2 2021 thru Q1 2022, ending less than one year ago, with operating data reflecting a completely non-viable period of commercial operation of a CCS modified power plant.
>
> The unacknowledged operating data representing these 4 quarters of problematic BD3 plant performance, was provided in SaskPower's July 22, 2022 BD3 operations report at: https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q2-2022 . In this report, characterizing the annual period, Q2 2021 thru Q1 2022, Saskpower acknowledged that in 3 of the 4 quarters covered, the BD3 unit failed to meet Canada's "Carbon Tax Threshold" of 594 Mt of CO_2/GWh. This "threshold" represents a CO_2 capture rate of approximately 46%.
>
> After 8¼ years of demonstration, such failure to meet negligible standards for emissions limitations, over a full year period ending less than one year ago, argues strongly for ***not*** considering BD3 as a credible basis for Best System of Emissions Reduction and "adequate demonstration" of the related technology. Furthermore, with global and U.S. power plant emission policies clearly aimed at 100% elimination of carbon emissions from the electricity sector, it is incongruous and impractical to expect that a policy reflecting acceptance of such a low standard of performance could be financed and implemented.

These comments were sanitized at some point in this process and were excluded from the published DoE comments to EPA which made their way into the administrative record. That record therefore is incomplete. All of this violates the Clean Air Act, the right to due process, and the Administrative Procedure Act.

CONCLUSION

For reasons stated above, the flagship among the Agency's "suite of standards" the CPS violates the major questions doctrine and the related rule against pretext. However, the GHG standard has another fatal deficiency. Justice Kagan's dissent in *West Virginia*—which opinion vacated an Obama-era "Clean Power Plan"—suggested that the Court's majority opinion would allow for either fuel switching (to 'clean hydrogen') or carbon capture and sequestration (CCS) as the best available system of emission reductions. The subsequent CPS as originally proposed required either fuel switching to hydrogen or CCS; EPA then dropped the hydrogen option, i.e., required CCS as a BSER.

As the Agency now sets forth in its Proposed Repeal, subsequent experience shows CCS remains to this day far from being "adequately demonstrated," which reality EPA misrepresented in its post-*West Virginia* CPS. The most reasonable conclusion from the Agency having buried DoE's pre-proposal comments is that the Agency intentionally misrepresented the knowledge of CCS's failings in pursuit of its objective, initially admitted to, of forcing "generation shifting."

The evidence, quoted and linked to above and attached below, shows that EPA not only should have known, but *did in fact know*—via comments transmitted to it by the Department of Energy, which the Agency then buried—that its claims about CCS were demonstrably untrue.

Rescinding a regulation typically requires going through the same lengthy process necessary to impose a rule. That is what the Agency is pursuing by its Proposed Repeal. This also will then be subject to judicial review, and the courts frequently send aspiring reformers back to the drawing board. This tendency by the courts to find procedural fault in regulations rescinded only by way of the Federal Register promises years of litigation and uncertainty in for your efforts to reconsider or rescind EPA regulations.[24]

However, a confession of error of law, fact or procedure that is supported by documentary evidence illustrating the admitted wrongdoing will be accepted by the courts.[25] Confessing error is a practice by which the government admits that it has misstepped such that annulment of an agency's judgment or proceeding is warranted. The Agency—but only the Agency—can confess error and address the fatally flawed administrative record built by bureaucrats on a foundation of pretext.[26] It should do so in its Repeal of the GHG emission standards for stationary sources.

THANK YOU FOR YOUR ATTENTION TO THIS MATTER.

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[24] We also note the industry dedicated to ensuring such delays, through litigation. See, e.g., Daniel Lyons, "The Administrative Law of Deregulation: The Long Road for the Trump Administration to Undo Obama-Era Regulations," Boston Bar Association, August 9, 2017, https://bostonbar.org/journal/the-administrative-law-of-deregulation-the-long-road-for-the-trump-administration-to-undo-obama-era-regulations/; Telis Demos, Jinjoo Lee, David Wainer, "Not All Trump 2.0 Regulatory Initiatives Will Survive—Here's Why," *Wall Street Journal*, Nov. 24, 2024, https://www.wsj.com/politics/policy/not-all-trump-2-0-regulatory-initiatives-will-surviveheres-why-aab33ab3. See also *Department of Homeland Security v. Regents of Univ. of Cal*., 591 U.S. 1 (2020) (DACA).

[25] *See Ethyl Corp. v. Browner*, 989 F.2d 522, 524 (D.D.C. 1993) (holding that where there was significant new evidence, a remand was appropriate).

[26] See, Chris Horner, "Trump Will Want to 'Confess Error'," *Wall Street Journal*, Nov. 17, 2024, https://www.wsj.com/opinion/trump-will-want-to-confess-error-deregulation-agencies-06b5cb2b.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA-HQ-OAR-2023-0072; FRL-XXXX]

RIN 2060-AV09 and 2060-AV10

New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule

AGENCY: Environmental Protection Agency (EPA)

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing amendments to the new source performance standards (NSPS) for greenhouse gas (GHG) emissions from new fossil fuel-fired stationary combustion turbine electric generating units (EGUs) based upon the eight-year review required by the Clean Air Act (CAA). The EPA is also proposing to repeal the Affordable Clean Energy rule (ACE Rule) and is proposing new emission guidelines for GHG emissions from existing fossil fuel-fired steam generating EGUs, which include both coal-fired and oil/gas-fired steam generating EGUs, to replace the repealed ACE Rule.

DATES: *Comments.* Comments must be received on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Comments on the information collection provisions submitted to the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA) are best assured of consideration by OMB if OMB moved through the flue gas duct system by fans. The concentration of CO_2 in most fossil fuel combustion flue gas streams is somewhat dilute. Most post-combustion capture systems utilize liquid solvents—most commonly amine-based solvents—that separate the CO_2 from the flue gas in CO_2 scrubber systems through the use of chemical absorption (or chemisorption). In a chemisorption-based separation process, the flue gas is processed through the CO_2 scrubber and the CO_2 is absorbed by the liquid solvent. The CO_2-rich solvent is then regenerated by heating the solvent to release the captured CO_2. The high purity CO_2 is then compressed and transported, generally through pipelines, to a site for geologic sequestration (*i.e.,* the long-term containment of CO_2 in subsurface geologic formations). These sequestration sites are widely available across the nation, and the EPA has developed a comprehensive regulatory structure to oversee geological sequestration projects and assure their safety and effectiveness. See 80 FR 64549 (October 23, 2015).

(A) Adequately Demonstrated

For new base load combustion turbines, the EPA proposes that CCS with a 90 percent capture rate, beginning in 2035, meets the BSER criteria. This amount of CCS is feasible and has been adequately demonstrated. The use of CCS at this level can be implemented at reasonable cost because it allows affected sources to maximize the benefits of the IRC section 45Q tax credit, and sources can maintain it over time by capturing a higher percentage at certain times in order to offset a lower capture rate at other times due to, for example, the need to undertake maintenance or due to unplanned capture system outages.

The EPA previously determined "partial CCS" to be a component of the BSER (in combination with the use of a highly efficient supercritical utility boiler) for new coal-fired steam generating units as part of the 2015 NSPS (80 FR 64538; October 23, 2015). As described in that action, numerous projects demonstrate the feasibility and effectiveness of CCS technology. Additional projects since publication of that rule provide confirmation.

In the 2015 NSPS, the EPA considered coal-fired industrial projects that had installed at least some components of CCS technology. In doing so, the EPA recognized that some of those projects had received assistance in the form of grants, loan guarantees, and federal tax credits for investment in "clean coal technology," under provisions of the Energy Policy Act of 2005 ("EPAct05"). See 80 FR 64541–42 (October 23, 2015). (The EPA refers to projects that received assistance under that legislation as "EPAct05-assisted projects.") The EPA further recognized that the EPAct05 included provisions that constrained how the EPA could rely on EPAct05 projects in determining whether technology is adequately demonstrated for the purposes of CAA section 111.[220] The EPA went on to provide a legal interpretation of those constraints. Under that legal interpretation, "these provisions [in the EPAct05] … preclude the EPA from relying solely on the experience of facilities that received [EPAct05] assistance, but [do] not … preclude the

[220] The relevant EPAct05 provisions include the following: Section 402(i) of the EPAct05, codified at 42 U.S.C. 15962(a), provides as follows:
"No technology, or level of emission reduction, solely by reason of the use of the technology, or the achievement of the emission reduction, by 1 or more facilities receiving assistance under this Act, shall be considered to be adequately demonstrated [ ] for purposes of section 111 of the Clean Air Act. . . ."
IRC section 48A(g), as added by EPAct05 1307(b), provides as follows:
"No use of technology (or level of emission reduction solely by reason of the use of the technology), and no achievement of any emission reduction by the demonstration of any technology or performance level, by or at one or more facilities with respect to which a credit is allowed under this section, shall be considered to indicate that the technology or performance level is adequately demonstrated [ ] for purposes of section 111 of the Clean Air Act. . . ."
Section 421(a) states:
"No technology, or level of emission reduction, shall be treated as adequately demonstrated for purpose [*sic*] of section 7411 of this title, . . . solely by reason of the use of such technology, or the achievement of such emission reduction, by one or more facilities receiving assistance under section 13572(a)(1) of this title."

EPA from relying on the experience of such facilities in conjunction with other information."[221] Id. at 64541–42. In the present action, the EPA is applying the same legal interpretation and is not reopening it for comment.

(1) CO_2 Capture Technology

The EPA is proposing that the CO_2 capture component of CCS has been adequately demonstrated and is technically feasible based on the demonstration of the technology at existing coal-fired steam generating units and industrial sources in addition to combustion turbines. While the EPA would propose that the CO_2 capture component of CCS is adequately demonstrated on those bases alone, this determination is further corroborated by EPAct05-assisted projects.

Various technologies may be used to capture CO_2, the details of which are described in the TSD titled *GHG Mitigation Measures – 111(d)*, which is available in the rulemaking docket. For post-combustion capture, these technologies include solvent-based methods (*e.g.*, amines, chilled ammonia), solid sorbent-based methods, membrane filtration, pressure-swing adsorption, and cryogenic methods.[222] Lastly, oxy-combustion uses a purified oxygen stream from an air separation unit (often diluted with recycled CO_2 to control the flame temperature) to combust the fuel and produce a higher concentration of CO_2 in the flue gas, as opposed to combustion with oxygen in air which contains 80 percent nitrogen. The CO_2 can then be separated by the

[221] In the 2015 NSPS, the EPA adopted several other legal interpretations of these EPAct05 provisions as well, which it is not reopening in this rule. See 80 FR 64541 (October 23, 2015).

[222] For pre-combustion capture (as is applicable to an IGCC unit), syngas produced by gasification passes through a water-gas shift catalyst to produce a gas stream with a higher concentration of hydrogen and CO_2. The higher CO_2 concentration relative to conventional combustion flue gas reduces the demands (power, heating, and cooling) of the subsequent CO_2 capture process (*e.g.*, solid sorbent-based or solvent-based capture), the treated hydrogen can then be combusted in the unit.

A Author

The EPA is primarily predicating its determination of CCS technology being "adequately demonstrated" once again based on the performance of the Boundary Dam Unit #3 (BD3) CCS demonstration project performance. This was the approach taken in the October 23, 2015 "*Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units; Final Rule*" (see: https://www.federalregister.gov/documents/2015/10/23/2015-22837/standards-of-performance-for-greenhouse-gas-emissions-from-new-modified-and-reconstructed-stationary) *In this document, BD3 was cited 40 times as operating satisfactorily to enable characterization of the application of retrofitted CCS as BSER and as to qualify as "adequately demonstrated".* EPA missed the significant news of a major equipment malfunction on the CCS portion of the plant, that had become known by the time of the publication of the Federal Register Standards of Performance. Evidence, as further discussed in comments below, confirms that the ongoing operating performance of the same BD3 demonstration project is being, once again, misconstrued as having provided sufficient justification for claiming satisfactory performance to allow the technology to be considered "adequately demonstrated" and BSER. For examples of Congressional reaction that may be expected from a repeat of misconstruing the level of success based on the BD3 operating data, a legacy of noteworthy comments and

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For examples of Congressional reaction that may be expected from a repeat of misconstruing the level of success based on the BD3 operating data, a legacy of noteworthy comments and reactions during the earlier 2015 experience is available at:
https://www.manchin.senate.gov/newsroom/press-releases/manchin-refutes-basis-of-clean-power-plan-in-letter-to-epa-administrator

Senator Manchin Letter to Administrator Gina McCarthy:
https://www.manchin.senate.gov/download/adminstrator-mccarthy-clean-power-planpdf

https://www.manchin.senate.gov/newsroom/in-the-news/sen-joe-manchin-takes-fight-to-epa-clean-air-regulators-the-intelligencer

https://www.manchin.senate.gov/newsroom/press-releases/manchin-applauds-passage-of-resolutions-to-eliminate-unreasonable-epa-regulations-for-coal-fired-plants aforementioned CO_2 capture methods. Of the available capture technologies, solvent-based processes have been the most widely demonstrated at commercial scale for post-combustion capture, and are applicable to use with either combustion turbines or steam generating units.

Solvent-based capture processes usually use an amine (*e.g.*, monoethanolamine, MEA). Carbon capture occurs by reactive absorption of the CO_2 from the flue gas into the amine solution in an absorption column. The amine reacts with the CO_2 but will also react with potential contaminants in the flue gas, including SO_2. After absorption, the CO_2-rich amine solution passes to the solvent regeneration column, while the treated gas passes through a water wash column to limit emission of amines or other byproducts. In the solvent regeneration column, the solution is heated (using steam) to release the absorbed CO_2. The released CO_2 is then compressed and transported offsite by pipeline. The amine solution from the regenerating column is cooled and sent back to the absorption column, and any spent solvent is replenished with new solvent.

(2) Capture Demonstrations at Coal-fired Steam Generating Units and Industrial Processes

The function, design, and operation of post-combustion CO_2 capture equipment is similar, although not identical, for both steam generating units and combustion turbines. As a result, application of CO_2 capture at existing coal-fired steam generating units helps demonstrate the adequacy of the CO_2 capture component of CCS.

SaskPower's Boundary Dam Unit 3, a 110 MW lignite-fired unit in Saskatchewan, Canada, has demonstrated CO_2 capture rates of 90 percent using an amine-based post-combustion capture system retrofitted to the existing steam generating unit. The capture plant, which began operation in 2014, was the first full-scale CO_2 capture system retrofit on an existing coal-fired power plant. It uses the amine-based Shell CANSOLV process, with integrated heat

Author

Over 8¼ years of demonstration (99 months) BD3 has only approached (but did not achieve) 90% capture in two months (January 2016 and October 2017.)

Reply

and power from the steam generating unit.[223] While successfully demonstrating the commercial-scale feasibility of 90 percent capture rates, the plant has also provided valuable lessons learned for the next generation of capture plants. A feasibility study for SaskPower's Shand Power Station indicated achievable capture rates of 97 percent, even at lower loads.[224]

For all industrial processes, operational availability (the percent of time a unit operates relative to its planned operation) is usually less than 100 percent due to unplanned maintenance and other factors. As a first-of-a-kind commercial-scale project, Boundary Dam Unit 3 experienced some additional challenges with availability during its initial years of operation, due to the fouling of heat exchangers and issues with its CO_2 compressor.[225] However, identifying and correcting those problems has improved the operational availability of the capture system. The facility has reported greater than 90 percent capture system availability in the second and third quarters of 2022.[226] Currently, newly constructed and retrofit CO_2 capture systems are anticipated to have operational availability of around 90 percent, on the same order of that is expected at coal-fired steam generating units. The EPA is soliciting comment on information relevant to the expected operational availability of new and retrofit CO_2 capture systems.

[223] Giannaris, S., *et al.* Proceedings of the 15^{th} International Conference on Greenhouse Gas Control Technologies (March 15–18, 2021). *SaskPower's Boundary Dam Unit 3 Carbon Capture Facility–The Journey to Achieving Reliability*. Accessed at *https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3820191.*

[224] International CCS Knowledge Centre. The Shand CCS Feasibility Study Public Report. Accessed at *https://ccsknowledge.com/pub/Publications/Shand_CCS_Feasibility_Study_Public_Report_Nov2018_(2021-05-12).pdf.*

[225] S&P Global Market Intelligence (January 6, 2022). *Only still-operating carbon capture project battled technical issues in 2021.* Accessed at *https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/only-still-operating-carbon-capture-project-battled-technical-issues-in-2021-68302671.*

[226] SaskPower (October 18, 2022). *BD3 Status Update: Q3 2022*. Accessed at *https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q3-2022.*

A **Author**

This is misleading as the BD3 unit has not demonstrated feasibility of 90 percent capture rates. The average monthly capture rate over 99 months has been approximately 50,600 tonnes per month, or approximately 53.2% of the annual design emissions expectation of 1,027,000 tonnes per year. The plant has occasionally exceeded 90% CO2 capture rates for limited, non-commercial periods of time.

Reply

A **Author**

Such challenges have continued to impact the commercial operation of BD3 throughout the 99 months for which operation reports are available. The average period between significant maintenance and repair events has been approximately 15 months. As a result of these events "operational availability" has been well below 100 percent and below levels that would normally be expected for an acceptable commercial power plant operation.

Reply

A **Author**

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[224] International CCS Knowledge Centre. The Shand CCS Feasibility Study Public Report. Accessed at *https://ccsknowledge.com/pub/Publications/Shand_CCS_Feasibility_Study_Public_Report_Nov2018_(2021-05-12).pdf.*

[225] S&P Global Market Intelligence (January 6, 2022). *Only still-operating carbon capture project battled technical issues in 2021.* Accessed at *https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/only-still-operating-carbon-capture-project-battled-technical-issues-in-2021-68302671.*

[226] SaskPower (October 18, 2022). *BD3 Status Update: Q3 2022*. Accessed at *https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q3-2022.*

Author

This reference to a SaskPower BD3 operations report, dated October 18, 2022, (footnote 226) fails to acknowledge the data provided by SaskPower, in the same report, for the preceding, low-performing 3 quarters, Q3 2021, Q4 2021, and Q1 2022. These three quarters were part of a full year period of 4 quarters, Q2 2021 thru Q1 2022, ending less than one year ago, with operating data reflecting a completely non-viable period of commercial operation of a CCS modified power plant. The unacknowledged operating data representing these 4 quarters of problematic BD3 plant performance, was provided in SaskPower's July 22, 2022 BD3 operations report at: https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q2-2022 . In this report, characterizing the annual period, Q2 2021 thru Q1 2022, Saskpower acknowledged that in 3 of the 4 quarters covered, the BD3 unit failed to meet Canada's "Carbon Tax Threshold" of 594 Mt of CO2/GWh. This "threshold" represents a CO2 capture rate of approximately 46%.
After 8¼ years of demonstration, such failure to meet negligible standards for emissions limitations, over a full year period ending less than one year ago, argues strongly for *not* considering BD3 as a credible basis for Best System of Emissions Reduction and "adequate demonstration" of the related technology. Furthermore, with global and U.S. power plant emission policies clearly aimed at 100% elimination of carbon emissions from the electricity sector, it is incongruous and impractical to expect that a policy reflecting acceptance of such a low standard of performance could be financed and implemented.

process but that uses a proprietary solvent and is optimized for CO_2 capture from a coal-fired generator's flue gas. During its operation, the project successfully captured 92.4 percent of the CO_2 from the slip stream of flue gas processed with 99.08 percent of the captured CO_2 sequestered by EOR. Plant Barry in Mobile, Alabama, began using the KM-CDR Process® in 2011 for a fully integrated 25-MW CCS project with a capture rate of 90 percent.[239] The CCS project at Plant Barry captured approximately 165,000 tons of CO_2 annually, which is then transported via pipeline and sequestered underground in geologic formations. See 80 FR 64552 (October 23, 2015).

(5) CO_2 Transport

The majority of CO_2 transported in the U.S. is transported through pipelines. Pipeline transport of CO_2 has been occurring for nearly 60 years, and over this time, the design, construction, and operational requirements for CO_2 pipelines have been demonstrated. Moreover, the U.S. CO_2 pipeline network has steadily expanded, and appears primed to continue to do so. The Pipeline and Hazardous Materials Safety Administration (PHMSA) reported that 5,339 miles of CO_2 pipelines were in operation in 2021, a 13 percent increase in CO_2 pipeline miles since 2011.[240] Moreover, several major projects have recently been announced to expand the CO_2 pipeline network across the U.S. For example, the Midwest Carbon Express and Heartland Greenway have proposed to add more than a combined 1,600 miles of dedicated CO_2 pipeline in Iowa, Nebraska, North Dakota, South Dakota, Minnesota, and Illinois. The Midwest Carbon Express is projected to begin operations in 2024 and the Heartland Greenway is projected to start

Author

It should be noted that CO2 is typically (maybe always) transported as a liquid phase in pipelines.

Reply

[239] U.S. Department of Energy (DOE). National Energy Technology Laboratory (NETL). Accessed at *https://www.netl.doe.gov/node/1741*.

[240] U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration, "Hazardous Annual Liquid Data." 2021. Available online at: *https://www.phmsa.dot.gov/data-and-statistics/pipeline/gas-distribution-gas-gathering-gas-transmission-hazardous-liquids*.

solicited research proposals to strengthen CO_2 pipeline safety.[245] These CO_2 pipeline controls ensure that captured CO_2 will be securely conveyed to a sequestration site.

Transportation of CO_2 via pipeline is the most viable and cost-effective method at the scale needed for sequestration of captured EGU CO_2 emissions. However, CO_2 can also be liquified and transported via ship, road tanker, or rail tank cars when pipelines are not available. Liquefied natural gas and liquefied petroleum gases are already routinely transported via ship at a large scale, and the properties of liquified CO_2 are not significantly different.[246] In fact, the food and beverage as well as specialty gas industries already have experience transporting CO_2 by rail.[247] Road tankers and rail can transport smaller quantities of CO_2 and can be used in tandem with other modes of transportation to move CO_2 captured from an EGU.[248]

(6) Geologic Sequestration of CO_2

(a) Security of Sequestration

Geologic sequestration, which is the long-term containment of a CO_2 stream in subsurface geologic formations, is well proven and broadly available throughout the U.S. Geologic sequestration is based on a demonstrated understanding of the processes that affect the fate of CO_2 in the subsurface. These processes can vary regionally based on differences in subsurface geology. There have been numerous instances of geologic sequestration in the U.S. and overseas, and the U.S. has developed a detailed set of regulatory requirements to ensure the security of sequestered CO_2.

245 Ibid.
246 Intergovernmental Panel on Climate Change. (2005). Special Report on Carbon Dioxide Capture and Storage.
247 EU CCUS Projects Network. (2019). Briefing on Carbon Dioxide Specifications for Transport. *https://www.ccusnetwork.eu/sites/default/files/TG3_Briefing-CO2-Specifications-for-Transport.pdf.*
248 Ibid.

Author

There are no commercial-scale CO2 storage projects operating in the US. The FECM/NETL/DOE CarbonSAFE program defines a commercial-scale CO2 storage operation as one storing 50 Mega tonnes of CO2 or more over a 20 to 30 year time period. The only storage projects in the US are demonstration scale projects that have injected less than 1 to 5 Mtonnes of CO2 over their project duration which has been less than 5 years. CO2 EOR projects have injected CO2 for longer periods, but these are not the same as CO2 storage projects. In CO2 EOR, the pressures in the subsurface can be modified and controlled since fluid is injected and removed. CO2 storage typically involves CO2 injection with no fluid removal. A CO2 storage project must carefully monitor pressures in the storage formation and adjust injection rates as necessary to make sure the pressures in the storage formation do not exceed pressure limits given by the Class VI injection well regulations for CO2 storage injection wells.

Reply

sequestration well permit applications for proposed sequestration sites in at least seven states.[253, 254] States with UIC Class VI primacy are also processing injection permits for potential saline sequestration projects. In Wyoming, Class VI permit applications have been filed for a proposed saline sequestration facility located in southwestern Wyoming. At full capacity, the facility will permanently store up to 5 million metric tons of CO_2 annually from industrial facilities in the Nugget saline sandstone reservoir.[255]

Geologic sequestration has been proven to be successful and safe in projects internationally. Several facilities have geologically sequestered CO_2 for over ten years. In Norway, facilities conduct offshore sequestration under the Norwegian continental shelf.[256] In addition, the Sleipner CO_2 Storage facility in the North Sea, which began operations in 1996, injects around 1 million metric tons of CO_2 per year from natural gas processing.[257] The Snohvit CO_2 Storage facility in the Barents Sea, which began operations in 2008, injects around 0.7 million metric tons of CO_2 per year from natural gas processing. The SaskPower carbon capture and storage facility at Boundary Dam Power Station in Saskatchewan, Canada had, as of mid-

Author

This total capture statistic is from the July 22, 2022 SaskPower report on BD3 performance, through Q2 2022, at https://www.saskpower.com/about-us/our-company/blog/2022/bd3-status-update-q2-2022 (not the January 20, 2023 report referenced in footnote 258, which states "5,001,707 tonnes captured since operational start-up in 2014"). This latter report, through Q4 2022, was after 99 months of operation or 8.25 years. The design rate for capture on the unit was 1,027,000 tonnes per year, reflecting a design rate expectation of 8,472,750 tonnes by this point. The CO2 capture result, thus far, represents 59% of the original design rate for the unit's capture.

Reply

253 UIC regulations for Class VI wells facilitate the injection of CO_2 for geologic sequestration while protecting human health and the environment by ensuring the protection of underground sources of drinking water. The major components to be included in UIC Class VI permits are detailed further in Section VII.F.3.b.iii.

254 U.S. EPA Class VI Underground Injection Control (UIC) Class VI Wells Permitted by EPA as of January 12, 2023. Available online at: *https://www.epa.gov/uic/class-vi-wells-permitted-epa*.

255 Wyoming DEQ Class VI Permit Applications. Available online at: *https://deq.wyoming.gov/water-quality/groundwater/uic/class-vi/*.

256 "Injection and Geologic Sequestration of Carbon Dioxide: Federal Role and Issues for Congress." Congressional Research Service, September 22, 2022. Available online at: *https://crsreports.congress.gov/product/pdf/R/R46192*.

257 Zapantis, Alex, Noora Al Amer, Ian Havercroft, Ruth Ivory-Moore, Matt Steyn, Xiaoliang Yang, Ruth Gebremedhin, *et al.* "Global Status of CCS 2022." Global CCS Institute, 2022. Available online at: *https://status22.globalccsinstitute.com/2022-status-report/introduction/*.

2022, captured 4.6 million tons of CO_2 since it began operating in 2014.[258] Other international sequestration facilities in operation include Glacier Gas Plant MCCS (Canada),[259] Quest (Canada), and Qatar LNG CCS (Qatar).

(ii) EPAct05-Assisted Geologic Sequestration Projects

While the EPA is proposing that the sequestration component of CCS is adequately demonstrated based solely on the other demonstrations of geologic sequestration discussed in this preamble, adequate demonstration of geologic sequestration is further corroborated by geologic sequestration currently operational and planned projects assisted by grants, loan guarantees, and Federal tax credits for "clean coal technology" authorized by the EPAct05. 80 FR 64541-42 (October 23, 2015).

Two saline sequestration facilities are currently in operation in the U.S. and several are under development.[260] The Illinois Industrial Carbon Capture and Storage Project began injecting CO_2 from ethanol production into the Mount Simon Sandstone in April 2017. The project has the potential to store up to 5.5 million metric tons of CO_2,[261] and, according to the facility's report to the EPA's GHGRP, as of 2021, 2.5 million metric tons of CO_2 had been injected into the saline reservoir.[262] The Red Trail Energy CCS facility in North Dakota, which is the first saline

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[258] Boundary Dam Carbon Capture Project, accessed January 20, 2023. Available online at: *https://www.saskpower.com/Our-Power-Future/Infrastructure-Projects/Carbon-Capture-and-Storage/Boundary-Dam-Carbon-Capture-Project.*

[259] Zapantis, Alex, Noora Al Amer, Ian Havercroft, Ruth Ivory-Moore, Matt Steyn, Xiaoliang Yang, Ruth Gebremedhin, et al. "Global Status of CCS 2022." Global CCS Institute, 2022. Available online at: *https://status22.globalccsinstitute.com.*

[260] Zapantis, Alex, Noora Al Amer, Ian Havercroft, Ruth Ivory-Moore, Matt Steyn, Xiaoliang Yang, Ruth Gebremedhin, *et al.* "Global Status of CCS 2022." Global CCS Institute, 2022. Available online at: *https://status22.globalccsinstitute.com/.*

[261] Archer Daniels Midland, Monitoring, Reporting, and Verification Plan CCS#2, 2017. Available online at: *https://www.epa.gov/sites/default/files/2017-01/documents/adm_mrv_plan.pdf.*

[262] EPA Greenhouse Gas Reporting Program. Data reported as of August 12, 2022.

sequestration facility in the U.S. to operate under a state-led regulatory authority for carbon storage, began injecting CO_2 from ethanol production in 2022.[263] This project is expected to inject a total of 3.7 million tons of CO_2 over its lifetime.[264]

There are additional planned geologic sequestration facilities across the United States. Project Tundra, a saline sequestration project planned at the lignite-fired Milton R. Young Station in North Dakotais projected to capture 4 million metric tons of CO_2 annually.[265] The Great Plains Synfuel Plant currently captures 2 million metric tons of CO_2 per year, which is used for enhanced oil recovery (EOR).[266] A planned addition of saline sequestration for this facility is expected to increase the amount captured and sequestered (through both geologic sequestration and EOR) to 3.5 million metric tons of CO_2 per year.[267]

(iii) Security of Geologic Sequestration

Regulatory oversight of geologic sequestration is built upon an understanding of the proven mechanisms by which CO_2 is retained in geologic formations. These mechanisms include

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[263] Zapantis, Alex, Noora Al Amer, Ian Havercroft, Ruth Ivory-Moore, Matt Steyn, Xiaoliang Yang, Ruth Gebremedhin, et al. "Global Status of CCS 2022." Global CCS Institute, 2022. Available online at: *https://status22.globalccsinstitute.com*.

[264] North Dakota Industrial Commission, NDIC Case No. 28848—Draft Permit Fact Sheet and Storage Facility Permit Application," accessed on February 16, 2022, at *https://www.dmr.nd.gov/oilgas/GeoStorageofCO2.asp*. This injection well is permitted by North Dakota.

[265] Project Tundra. "Project Tundra." Accessed January 20, 2023. Available online at: *https://www.projecttundrand.com/*.

[266] Basin Electric Power Cooperative. "Great Plains Synfuels Plant Potential to Be Largest Coal-Based Carbon Capture and Storage Project to Use Geologic Storage," September 9, 2021. Available online at: *https://www.basinelectric.com/News-Center/news-releases/Great-Plains-Synfuels-Plant-potential-to-be-largest-coal-based-carbon-capture-and-storage-project-to-use-geologic-storage*.

[267] Basin Electric Power Cooperative. "Great Plains Synfuels Plant Potential to Be Largest Coal-Based Carbon Capture and Storage Project to Use Geologic Storage," September 9, 2021. Available online at: *https://www.basinelectric.com/News-Center/news-releases/Great-Plains-Synfuels-Plant-potential-to-be-largest-coal-based-carbon-capture-and-storage-project-to-use-geologic-storage*.

A Author

Should be "Dakota is".

Reply

(1) structural and stratigraphic trapping (generally trapping below a low permeability confining layer); (2) residual CO_2 trapping (retention as an immobile phase trapped in the pore spaces of the geologic formation); (3) solubility trapping (dissolution in the in situ formation fluids); (4) mineral trapping (reaction with the minerals in the geologic formation and confining layer to produce carbonate minerals); and (5) preferential adsorption trapping (adsorption onto organic matter in coal and shale).

Based on the understanding developed from natural analogs and existing projects, the security of sequestered CO_2 is expected to *increase* after injection ceases. This is due to drilling post-closure injection wells that decrease pressure[268] and to trapping mechanisms that reduce CO_2 mobility over time, *e.g.*, physical CO_2 trapping by a low-permeability geologic seal or chemical trapping by conversion or adsorption.[269] In addition, site characterization, site operations, and monitoring strategies as required through the Underground Injection Control (UIC) Program and the GHGRP, discussed below, work in combination to ensure security and transparency.

The UIC Program, the GHGRP and other regulatory requirements comprise a detailed regulatory framework for facilitating geologic sequestration in the U.S., according to a 2021 report from the Council on Environmental Quality (CEQ). This framework is already in place and capable of reviewing and permitting CCS activities.[270]

Author

This does not seem correct. Injection wells always increase pressure. Production wells can be used to decrease pressure by removing fluid. I am not aware of people proposing to install injection wells after closing other injection wells.

Reply

[268] "Report of the Interagency Task Force on Carbon Capture and Storage." 2010. Available online at: *https://www.osti.gov/servlets/purl/985209*.
[269] See, *e.g.*, Intergovernmental Panel on Climate Change. (2005). Special Report on Carbon Dioxide Capture and Storage.
[270] CEQ. *"Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration."* 2021. Available online at: *https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf*.

coal seams ranging from 90 tons to 16,700 tons.[286] DOE has judged unmineable coal seams worthy of inclusion in the NETL Atlas.[287]

Although the large-scale injection of CO_2 in coal seams can lead to swelling of coal, the literature also suggests that there are available technologies and techniques to compensate for the resulting reduction in injectivity.[288] Further, the reduced injectivity can be anticipated and accommodated in sizing and characterizing prospective sequestration sites.

There is sufficient technical basis and scientific evidence that depleted oil and gas reservoirs represent another option for geologic storage. The reservoir characteristics of older fields are well known as a result of exploration and many years of hydrocarbon production and in many areas infrastructure already exists for CO_2 transportation and storage.[289] Other types of

Author

It is not clear if CO2 injection into unmineable coal seams is economic even with tax credits.

Reply

[286] M. Godec *et al.*, "CO_2-ECBM: A Review of its Status and Global Potential," Energy Procedia 63: 5858–5869 (2014). Available online at: *https://doi.org/10.1016/j.egypro.2014.11.619.*

[287] U.S. DOE NETL, *Carbon Storage Atlas, Fifth Edition*, September 2015. Available online at: *https://www.netl.doe.gov/research/coal/carbon-storage/atlasv*.

[288] Xiachun Li & Zhi-Ming Fang, "Current Status and Technical Challenges of CO_2 Storage in Coal Seams and Enhanced Coalbed Methane Recovery: An Overview," International Journal of Coal Science & Technology, 93, 99 (2014) (suggesting existing technologies that can be used to address injectivity reduction in unmineable coal seams).

[289] The Texas Bureau of Economic Geology tested a wide range of surface and subsurface monitoring tools and approaches to document sequestration efficiency and sequestration permanence at the Cranfield oilfield in Mississippi. As part of a DOE Southeast Regional Carbon Sequestration Partnership study, Denbury Resources injected CO_2 into a depleted oil and gas reservoir at a rate greater than 1.2 million tons/year. Texas Bureau of Economic Geology, "Cranfield Log." Available online at: *https://www.beg.utexas.edu/gccc/research/cranfield.*

operations and maintenance costs.[439] These Quality Guidelines also provide an estimate of sequestration costs reflecting the cost of site screening and evaluation, permitting and construction costs, the cost of injection wells, the cost of injection equipment, operation and maintenance costs, pore volume acquisition expense, and long-term liability protection.

NETL's Quality Guidelines model costs for a given cumulative storage potential. At a storage potential of 25 gigatons of CO_2, costs range between $7.54/ton ($8.32/metric ton) sequestered (in the Illinois Basin) and $18.00/ton ($19.84/metric ton) sequestered (in the Powder River Basin).[440]

(C) Amortization Period and Annual Capacity Factor

In the EPA's cost analysis for long-term coal-fired steam generating units, the EPA assumes a 12-year amortization period and a 50 percent annual capacity factor. The 12-year amortization period is consistent with the period of time during which the IRC section 45Q tax credit can be claimed and the 50 percent annual capacity factor is consistent with the historical fleet average. However, increases in utilization are likely to occur for units that apply CCS due to the incentives provided by the IRC section 45Q tax credit. Therefore, the EPA also assessed the costs for CCS retrofitted to existing coal-fired steam generating units assuming a 70 percent annual capacity factor. For a 70 percent annual capacity factor and a 12-year amortization period, the costs for the reference unit are -$8/ton of CO_2 reduced and -$7/MWh. For either capacity factor assumption, the $/MWh costs are comparable to or less than the representative cost of installing and operating wet FGD, costs for which are detailed in VII.F.3.b.iii.(B)5.

A Author

Need to explain this claim further. At a fixed 50% CF, retrofitting CCS results in a fleet average cost of electricity increase of $7/MWh with 45Q credits. The claim here suggests that retrofitting with increased electricity cost moves coal plants up in the dispatch curve.

Reply

[439] Grant, T., *et al.* "Quality Guidelines for Energy System Studies; Carbon Dioxide Transport and Storage Costs in NETL Studies." National Energy Technology Laboratory. 2019. Available online at: *https://www.netl.doe.gov/energy-analysis/details?id=3743.*
[440] *Ibid.*

any auxiliary source of heat and power is part of the "designated facility," along with the steam generating unit. The standards of performance apply to the designated facility. Thus, any CO_2 emissions from the connected auxiliary equipment need to be captured or they will increase the facility's emission rate.

Using integrated heat and steam can reduce the capacity (*i.e.,* the amount of electricity that a unit can distribute to the grid) of a 474 MW-net (501 MW-gross) coal-fired steam generating unit without CCS to 425 MW-net with CCS and contributes to a reduction in net efficiency of 23 percent.[443] Despite decreases in efficiency, IRC section 45Q tax credits provide an incentive for increased utilization. The Agency is proposing that the energy penalty is relatively minor compared to the GHG benefits of CCS and, therefore, does not disqualify CCS as being considered the BSER for existing coal-fired steam generating units.

Additionally, the EPA considered the impacts on the power sector, on a nationwide and long-term basis, of determining CCS to be the BSER for long-term coal-fired steam generating units. The EPA is proposing that designating CCS as the BSER for existing long-term coal-fired steam generating units would have limited and non-adverse impacts on the long-term structure of the power sector. Absent the requirements defined in this action, the EPA projects that 9 GW of coal-fired steam generating units would apply CCS by 2030 and 35 GW of coal-fired steam generating units, some without controls, would remain in operation in 2040. Designating CCS to be the BSER for existing long-term coal-fired steam generating units would likely result in more of the coal-fired steam generating unit capacity applying CCS. The time available before the compliance deadline of January 1, 2030, provides for adequate resource planning, including

[443] DOE/NETL-2016/1796. "Eliminating the Derate of Carbon Capture Retrofits." May 31, 2016. Accessed at *https://www.netl.doe.gov/energy-analysis/details?id=d335ce79-84ee-4a0b-a27b-c1a64edbb866.*

A Author

Exhibit ES-2 of the referenced study provides a pre-retrofit plant capacity of 581 MWe-gross and 550 MWe-net. The

Reply

required to have SCR, increased utilization from a CO_2 capture retrofit could result in increased emissions that may trigger New Source Review (NSR) permitting requirements and, in turn, may require the installation of SCR for those units. See section XIII.A of this preamble.

(C) Water Use and Siting

Water consumption at the plant increases when applying carbon capture, due to solvent water makeup and cooling demand. Water consumption can increase by 36 percent on a gross basis.[446] A separate cooling water system dedicated to a CO_2 capture plant may be necessary. However, the amount of water consumption depends on the design of the capture system. For example, the cooling system cited in the CCS feasibility study for SaskPower's Shand Power station would rely entirely on water condensed from the flue gas and thus would not require any increase in external water consumption.[447] Regions with limited water supply may rely on dry or hybrid cooling systems, although, in areas with adequate water, wet cooling systems can be more effective.

With respect to siting considerations, CO_2 capture systems have a sizeable physical footprint and a consequent land-use requirement. The EPA is proposing that the water use and siting requirements are manageable and therefore the EPA does not expect any of these considerations to preclude coal-fired power plants generally from being able to install and operate CCS. However, the EPA is soliciting comment on these issues.

Author

As well as the design of the cooling system. Air cooled heat exchangers (ACHE) can be used in place of evaporative cooling towers with the tradeoff being higher auxiliary load and reduced cooling capacity. NETL has performed analysis in this area.

https://www.osti.gov/servlets/purl/1529314

Reply

446 DOE/NETL-2016/1796. "Eliminating the Derate of Carbon Capture Retrofits." May 31, 2016. Accessed at *https://www.netl.doe.gov/energy-analysis/details?id=e818549c-a565-4cbc-94db-442a1c2a70a9*.

447 International CCS Knowledge Centre. The Shand CCS Feasibility Study Public Report. Accessed at *https://ccsknowledge.com/pub/Publications/Shand_CCS_Feasibility_Study_Public_Report_Nov2018_(2021-05-12).pdf*.

Milestone Report, annual Milestone Status Reports, and final Milestone Status Report, including the schedule for achieving milestones and any documentation necessary to demonstrate that milestones have been achieved, on the CAA Section 111(d) EGU Rule Website, as described in Section XI.F.1.b, within 30 business days of being filed.

The EPA recognizes that applicable regulatory authorities, retirement processes, and retirement approval criteria will vary across states and affected EGUs. The proposed milestone requirements are intended to establish a general framework flexible enough to account for significant differences across jurisdictions while assuring timely planning toward the dates by which affected EGUs permanently cease operations. The EPA requests comment on this proposed approach, specifically whether any jurisdictions present unique state circumstances that should be considered when defining milestones and the required reporting elements.

4. Testing and Monitoring Requirements

The EPA is proposing to require states to include in their plans a requirement that affected EGUs monitor and report hourly CO_2 mass emissions emitted to the atmosphere, total heat input, and total gross electricity output, including electricity generation and, where applicable, useful thermal output converted to gross MWh, in accordance with the 40 CFR part 75 monitoring and reporting requirements. Under this proposal, affected EGUs would be required to use a 40 CFR part 75 certified monitoring methodology and report the hourly data on a quarterly basis, with each quarterly report due to the Administrator 30 days after the last day in the calendar quarter. The monitoring requirements of 40 CFR part 75 require most fossil fuel-fired boilers to use a CO_2 CEMS, including a CO_2 concentration monitor and stack gas flow monitor, although some oil- and natural gas-fired boilers may have options to use alternative measurement methodologies (*e.g.*, fuel flow meters). A CO_2 CEMS is the most technically

Author

Per Litynski review request, this is already being performed done as part of EPA CAMPD program.

Reply

sequestration site are not part of that calculation. However, to verify that the CO_2 captured at the emitting EGU is sent to a geologic sequestration site, we are leveraging regulatory requirements under the GHGRP. Further, we note that the determination that the BSER is adequately demonstrated relies on geologic sequestration that is not associated with EOR; however EGUs would have the option to send CO_2 to EOR facilities that report under GHGRP subpart RR or GHGRP subpart VV. We also emphasize that this proposal does not involve regulation of downstream recipients of captured CO_2. That is, the regulatory standard applies exclusively to the emitting EGU, not to any downstream user or recipient of the captured CO_2. The requirement that the emitting EGU assure that captured CO_2 is managed at an entity subject to the GHGRP requirements is thus exclusively an element of enforcement of the EGU standard. Similarly, the existing regulatory requirements applicable to geologic sequestration are not part of the proposed rule.

Author

Because of uncertainty and lack of EPA decision on Class IV wells, I'm unaware that a sufficient quantity of injection data exists to support determination that non-EOR associated sequestration is demonstrated.

Reply

The EPA requests comment on the following questions related to additional monitoring and reporting of hourly captured CO_2 under 40 CFR part 75: a) should EGUs with carbon capture technologies be required to monitor and report the hourly captured CO_2 mass emissions under 40 CFR part 75, b) if EGUs with carbon capture technologies are not required to monitor and report the hourly captured CO_2 mass emissions, the calculation procedures for total heat input and NO_X rate in appendix F to 40 CFR part 75 may no longer provide accurate results; therefore, what changes might be necessary to accurately determine total heat input and NO_X rate, c) to ensure accurate and complete accounting of CO_2 mass emissions emitted to the atmosphere and captured for use or sequestration, at what locations should CO_2 concentration and stack gas flow be monitored, and should other values also be monitored at those locations, d) are there quality assurance activities outside of those required under 40 CFR part 75 for CO_2

2. Emission Trading

The EPA is seeking comment on whether it is appropriate to allow state plans to include emission trading programs as a compliance flexibility for affected EGUs under these emission guidelines, including whether certain types of trading programs may be more appropriate than others. This section discusses considerations related to whether the EPA should permit emission trading, as well as how, if emission trading is allowed, states could potentially incorporate a rate-based trading program or a mass-based trading program in a way that preserves the stringency of these emission guidelines. The EPA is seeking comment on these potential methods, as well as on other methods that could maintain the required level of emission performance under the proposed emission guidelines.

a. Considerations for Emission Trading in State Plans

Emission trading has been used to achieve required emission reductions in the power sector for nearly 3 decades. In Title IV of the Clean Air Act Amendments of 1990, Congress specified the design elements for the Acid Rain Program, a 48-state allowance trading program to reduce SO_2 emissions and the resulting acid precipitation. Building on the success of that first allowance trading program as a tool for addressing multi-state air pollution issues, the EPA has promulgated and implemented multiple allowance trading programs since 1998 for SO_2 or NO_X emissions to address the requirements of the CAA's good neighbor provision with respect to successively more stringent NAAQS for fine particulate matter and ozone. The EPA currently administers eight power sector emission trading programs that differ in pollutants, geographic

Author

The Supreme Court held in WV v EPA (2022) that Congress has not authorized EPA to establish a CO2 emissions trading program under Section 111(d), noting that Congress has already considered and rejected the notion numerous times.

Reply