

Comments of the American Petroleum Institute on EPA’s 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

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I. Introduction

The American Petroleum Institute (API) appreciates the opportunity to comment on the U.S. Environmental Protection Agency’s (EPA) proposed 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 (88 FR 33240).

II. API’s Interest in This Proceeding

API is a national trade association representing approximately 600 member companies involved in all aspects of the oil and natural gas industry. API’s members include producers, refiners, suppliers, pipeline operators, and liquefied natural gas (LNG) exporters, as well as service and supply companies that support all segments of the industry. API advances its policy priorities by collaborating with industry, government and customer stakeholders to promote continued availability of our nation’s abundant oil and natural gas resources for a more secure energy future. API frequently participates in proceedings before EPA and other federal agencies, as well as in litigation in state and federal courts.

As described above, API represents all segments of the natural gas industry. In recent years, natural gas has become the dominant fuel for power generation in the U.S. In 2022, natural gas accounted for 40% of total utility-scale power generation – up from just 19% in 2005.¹ The power sector now represents the largest demand sector for natural gas.² Additionally, API member

¹ “Monthly Energy Review.” Energy Information Administration. Available at: <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> at 133.

² *Ibid*, at 106.

companies are making significant investments in both carbon capture and storage (CCS) and hydrogen, technologies that EPA is proposing to use to set the emission standards. API and industry are actively advocating for and supporting the scale-up of these technologies, consistent with our strong record of driving greenhouse gas (GHG) emissions reductions in the US. For those reasons, API has an interest in the outcome of this proceeding.

III. API's Comments

As noted in our Climate Action Framework, API believes low-carbon technologies like CCS and hydrogen are key to meaningfully reducing GHG emissions while continuing to deliver essential energy.³ Another important advantage of these technologies is that they can help to decarbonize hard-to-abate sectors. The need to develop and deploy carbon capture and removal technologies has been recognized by climate experts globally, including the International Energy Association (IEA) and the Intergovernmental Panel on Climate Change (IPCC). The IEA has stated that CCUS technologies will play a key role in the global drive to reduce CO₂ emissions⁴ and recognized the potential for low-carbon hydrogen to decarbonize hard-to-abate sectors.⁵ Among the potential decarbonization pathways IPCC considers, there is a median of 665 gigatons of CO₂ that will need to be cumulatively captured and stored between now and 2100,⁶ or nearly 9 gigatons captured or removed and stored on average, globally, per year.⁷ Annual CO₂ emissions from the U.S. power sector totaled roughly 1.54 gigatons in 2022.⁸

The federal government has also demonstrated its commitment to supporting the deployment of these technologies. Through the passage of the *Infrastructure Investment and Jobs Act* (IIJA) and the *Inflation Reduction Act* (IRA), the federal government has reiterated the need

³ "Climate Action Framework." American Petroleum Institute. Available at: <https://www.api.org/-/media/files/ehs/climate-change/2021/api-climate-action-framework.pdf>.

⁴ International Energy Association. "CCUS in Clean Energy Transitions." September 2020. Available at: <https://www.iea.org/reports/ccus-in-clean-energy-transitions>.

⁵ "The Future of Hydrogen." International Energy Agency. June 2019. Available at <https://www.iea.org/reports/the-future-of-hydrogen>.

⁶ "What Does the Latest IPCC Report Say about Carbon Capture?" Matt Bright and Toby Lockwood. Clean Air Task Force. April 2022. Available at: <https://www.catf.us/2022/04/what-does-latest-ipcc-report-say-about-carbon-capture/>.

⁷ "Climate Change 2022: Mitigation of Climate Change." Priyadarshi R. Shukla et al. IPCC Intergovernmental Panel on Climate Change. Available at <https://www.ipcc.ch/report/ar6/wg3/>.

⁸ "Monthly Energy Review." U.S. Energy Information Administration. Available at: <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> at 219.

for innovative low-carbon technologies and its commitment to the commercialization and deployment of carbon capture and hydrogen technology. IIJA appropriated \$12.1 billion for the large-scale demonstration and commercial deployment of the full suite of carbon management technologies, including for Direct Air Capture Hubs, and appropriated \$8 billion for the Regional Clean Hydrogen Hub program to advance the production, processing, delivery, storage, and end-use of clean hydrogen.⁹ The IRA expanded the tax credit for CCS under section 45Q of the Internal Revenue Code (IRC 45Q) and established a new tax credit under section 45V (IRC 45V) for clean hydrogen production.¹⁰ Continued national support for the development of these innovative technologies also creates an export opportunity, providing an economic opportunity for the U.S. to supply low-carbon technologies internationally. API is encouraged by the efforts of the federal government to advance and scale up the use of these technologies. The oil and natural gas industry has long been at the forefront of innovation, and it stands ready to work with policymakers to ensure the robust development of the CCS and hydrogen markets.

In this proposed rulemaking, EPA has determined that for baseload gas-fired generators, CCS and hydrogen blending each constitute the best system of emission reductions (BSER) that, considering costs, energy requirements and other statutory considerations, are adequately demonstrated. EPA has designated these compliance options respectively as the “CCS pathway” and the “hydrogen pathway.” As noted above, API is supportive of both these technologies, and its member companies are making significant investments in them.

However, API and others recognize that there are significant regulatory hurdles and other challenges that may hinder the buildout of infrastructure necessary to make CCS and hydrogen blending viable compliance pathways, especially given the proposed deadlines.¹¹ While API notes that EPA has acknowledged many of these challenges in the preamble of the proposal, we remain

⁹ Infrastructure Investment and Jobs Act, H.R. 3694, 117th Congress (2021). <https://www.congress.gov/bill/117th-congress/house-bill/3684/text>.

¹⁰ Inflation Reduction Act, H.R. 5376, 117th Congress (2022). <https://www.congress.gov/bill/117th-congress/house-bill/5376/text>

¹¹ “Decarbonization: Status, Challenges, and Policy Options for Carbon Capture, Utilization, and Storage.” Government Accountability Office. September 2022. Available at: <https://www.gao.gov/assets/gao-22-105274.pdf>.; [Scaling the CCUS industry to achieve net-zero | McKinsey](https://www.mckinsey.com/industries/energy/our-insights/scaling-the-ccus-industry-to-achieve-net-zero); “Assessing the challenges ahead for US carbon capture.” Ed Crooks. Wood Mackenzie. February 17, 2023. Available at: <https://www.woodmac.com/news/assessing-the-challenges-ahead-for-carbon-capture-in-the-us/>. <https://www.eenews.net/articles/epa-says-carbon-capture-is-within-reach-utilities-arent-biting/>.

concerned that not all of them will be resolved in time to meet the compliance deadlines EPA has proposed. In many instances, these challenges are under the jurisdiction of agencies other than EPA. API believes that this is not a technology challenge, but rather a timeline challenge. Further, many of the permitting issues are outside the control of power generators. Accordingly, API urges EPA to coordinate with the relevant agencies, regulatory bodies and Congress to address these challenges expeditiously so that power generators can confidently invest in the compliance options outlined in the rule and continue to support the reliability of the grid. API also urges EPA to maintain a technology neutral approach that allows for the use of a combination of hydrogen and CCS technologies to meet emission standards.

The following sections detail the areas in which API observes regulatory gaps, areas of uncertainty that require clarity and other potential sources of delays that could impede the orderly development of the network of CCS and hydrogen infrastructure, hydrogen supply and other parts of the value chain necessary to support the broad use of those technologies at power generators within EPA's proposed compliance deadlines. API and its member companies stand ready to work with EPA and other relevant agencies and authorities to ensure that existing barriers to infrastructure development are identified and resolved.

IV. Carbon Capture and Storage

Under EPA's proposed CCS pathway, the BSER for affected baseload gas-fired combustion turbines includes the use of CCS with a 90 percent capture rate with an associated standard of 90 pounds per megawatt-hour (lbs. CO₂/MWh) by 2035. EPA proposes to give states 24 months following finalization of the rule to submit their state implementation plans (SIP) for review. The latest Unified Regulatory Agenda indicates that EPA plans to finalize the rule by April 2024, implying that SIPs would need to be submitted around mid-2026. Under this schedule, generators would have less than a decade to implement CCS at their facility. For this to be a viable option, considerable infrastructure to capture, transport and sequester CO₂ needs to be developed over the next decade. For example, EPA notes in the preamble that the size of the CO₂ pipeline network needed to support broad use of CCS in the power sector ranges from 20,000 to 25,000 miles – or four to five times more than the roughly 5,300 miles that exist today.¹² A separate study conducted

¹² 88 Federal Register at 33369.

by Princeton University's Net Zero Lab found that as much as 65,000 miles of dedicated CO₂ pipelines may be needed to reach economy-wide net zero emissions.¹³

Companies have been successfully handling CO₂ for enhanced oil recovery since 1972.¹⁴ The first large-scale commercial CCS facility, Sleipner, has been capturing and permanently storing CO₂ since 1996 and is still in operation today.¹⁵ Despite the demonstrated nature of CCS and operators' willingness to deploy CCS technology, uncertainty on permitting timelines and regulations will impact the future availability of pipelines and storage facilities, as well as project financing and timelines, all of which are key elements to the successful implementation of this rule. Such uncertainty, unless adequately addressed by EPA and other relevant agencies, may limit power generators' ability to comply with EPA's proposal via the CCS pathway despite a demonstrated willingness among the natural gas and oil industry to support the deployment of CCS.¹⁶ Additionally, there is a continuous need to progress technology that can effectively capture CO₂ at low concentrations with lower capital and operating expenses. API believes the success of the CCS industry will be based on a clear and consistent regulatory framework for all parts of the value chain; efficient, environmentally-sound permitting processes for pipelines, sequestration sites and other needed infrastructure; broad understanding and acceptance of CCS as a means to reduce CO₂ emissions and improve air quality; the ability for investors in the industry to earn a reasonable return; and continued government support for research and development. These drivers, in addition to efficient timelines for deployment, will facilitate the development of a large, interconnected network of CO₂ pipelines that gives emitters options and provides the scale needed to drive down the cost of capturing, transporting and storing CO₂.

¹³ "Net Zero America." Princeton University. 2021. Available at: <https://www.dropbox.com/s/ptp92f65lgds5n2/Princeton%20NZA%20FINAL%20REPORT%20%2829Oct2021%29.pdf?dl=0>

¹⁴ "Understanding CCS." Global CCS Institute. Available at: <https://www.globalccsinstitute.com/about/what-is-ccs/>.

¹⁵ "20 years of Monitoring CO₂-Injection at Sleipner." Anne-Kari Furre et al. Energy Procedia, Volume 114. 2017. Available at: <https://www.sciencedirect.com/science/article/pii/S1876610217317174>.

¹⁶ "Carbon Capture and Storage: A Low-Carbon Solution to Economy-wide Greenhouse Gas Emissions Reductions." American Petroleum Institute. Available at: <https://www.api.org/news-policy-and-issues/carbon-capture-storage>; "Factbox: Energy firms bet big on carbon capture projects in U.S., Canada." Reuters. Available at: https://www.reuters.com/business/energy/energy-firms-bet-big-carbon-capture-projects-us-canada-2023-03-10/#:~:text=**%20Exxon%20Mobil%20is%20advancing,in%20the%20Asia%2DPacific%20region.

A. Class VI Permitting

Permitting processes can create significant obstacles to the efficient deployment of CCS. Storage site operators planning to inject and geologically store CO₂ must obtain a Class VI permit through EPA's Underground Injection Control (UIC) program. However, the timeline for obtaining a Class VI permit is extensive; to date EPA has approved only six total Class VI permits.¹⁷ There are currently over 100 Class VI permit applications awaiting EPA approval, and this number likely will increase significantly given the incentives available under IRC 45Q and if EPA finalizes the rule as proposed.¹⁸ The two active Class VI permits both took at least three years for EPA to approve – with one taking six years from the time of the initial permit application to the final authorization to inject.¹⁹ While API is encouraged by EPA's aim to issue permits for complete Class VI applications within approximately two years,²⁰ the length of and uncertainty associated with the permitting process could delay power generators' ability to start capturing CO₂ and, unless addressed by EPA and other relevant agencies, would likely limit their ability to comply with the rule by 2035.²¹ The uncertainty associated with the permit review and approval process could also limit electric utilities' willingness to invest in CCS projects. It is likely that power plant operators will not operate CO₂ storage facilities; these facilities are likely to be developed and operated by separate entities. As part of the UIC program, EPA is empowered to delegate Class VI permitting authority, known as "primacy", to states with underground injection regulatory frameworks that meet federal environmental standards. The delegation of Class VI permitting responsibilities to states reduces the burden on EPA and allows states to use their resources and expertise to effectively administer Class VI permitting programs. However, the state primacy application process is lengthy with an uncertain timeline, and the requirements are not consistent across EPA regions. Since the Class VI permitting program was established in 2010, only two states, North

¹⁷ "EPA Report to Congress: Class VI Permitting." U.S. Environmental Protection Agency. October 2022. Available at: <https://www.epa.gov/system/files/documents/2022-11/EPA%20Class%20VI%20Permitting%20Report%20to%20Congress.pdf>.

¹⁸ "Class VI Wells Permitted by EPA." U.S. Environmental Protection Agency. Available at: <https://www.epa.gov/uic/class-vi-wells-permitted-epa>.

¹⁹ "Observations on Class VI Permitting: Lessons Learned and Guidance Available." Bob Van Vorhees, Sallie Greenberg, and Steve Whittaker. (2021). Available at: <https://www.ideals.illinois.edu/items/117640>.

²⁰ "EPA Report to Congress: Class VI Permitting." U.S. Environmental Protection Agency. October 2022. Available at: <https://www.epa.gov/system/files/documents/2022-11/EPA%20Class%20VI%20Permitting%20Report%20to%20Congress.pdf>.

²¹ "Decarbonization: Status, Challenges, and Policy Options for Carbon Capture, Utilization, and Storage." Government Accountability Office. September 2022. Available at: <https://www.gao.gov/assets/gao-22-105274.pdf>.

Dakota and Wyoming, have received primacy. Louisiana submitted its primacy application in September 2021.²² EPA published a notice of proposed rulemaking granting Louisiana primacy in May 2023, with a final rulemaking still to follow. Texas is also awaiting a decision from EPA, having submitted its initial application for Class VI primacy in December 2022.²³ While obtaining primacy could provide an opportunity for states to expedite the Class VI permitting process, the lengthy timeline for primacy application approval also creates uncertainty and adds risk to any potential CCS infrastructure investment. To help resolve these challenges, API urges EPA to use the money appropriated to support federal Class VI permitting and state primacy in the IJA to improve the federal and state Class VI well permitting process.

B. Additional Permitting Requirements

Alongside the Class VI permitting requirements, CCS infrastructure projects (including CO₂ pipelines) would likely be subject to additional permitting requirements or processes, such as under the National Environmental Policy Act (NEPA). Under NEPA, federal actions that are found to significantly impact the environment require the preparation of an Environmental Impact Statement (EIS). In the case of CCS projects on federal lands or that require a federal permit, the lead federal agency would need to determine if NEPA applies and then determine whether an EIS is required.²⁴ A recent report on federal permitting timelines published by the Council on Environmental Quality (CEQ) found that the average EIS takes four-and-a-half years to complete, adding significant time to a project's development.²⁵ Further, while CEQ defined the EIS period as the time between publication of the Notice of Intent (NOI) and Record of Decision (ROD), there is considerable work that often occurs prior to issuance of the NOI as well as after the ROD.²⁶ The lengthy NEPA review process would likely further delay the construction and/or installation of capture equipment, storage facilities and interstate CO₂ pipelines, potentially impeding power generators' ability to comply with EPA's proposed timeline. While API is encouraged by the recent

²² 88 FR at 28452.

²³ "Geologic Storage of Anthropogenic CO₂." The Railroad Commission of Texas. Available at:

<https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/co2-storage/>.

²⁴ "Environmental Impact Statement Timelines (2010-2018)." Council on Environmental Quality. June 12, 2020.

Available at: https://ceq.doe.gov/docs/nepa-practice/CEQ_EIS_Timeline_Report_2020-6-12.pdf.

²⁵ "Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration."

Council on Environmental Quality. 2021. Available at: <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>.

²⁶ "Environmental Impact Statement Timelines (2010-2018)." Council on Environmental Quality. June 12, 2020.

Available at: https://ceq.doe.gov/docs/nepa-practice/CEQ_EIS_Timeline_Report_2020-6-12.pdf.

passage of the *Fiscal Responsibility Act* (FRA), which established statutory timelines for NEPA reviews, it is unclear whether the additional language for extension of review time will be the norm or the exception, thus maintaining the status quo.²⁷ For example, the Mountain Valley Pipeline was delayed by litigation despite being explicitly authorized by Congress in the FRA.²⁸ The NEPA timelines referenced in the FRA do not account for potential legal challenges that can further delay the permitting process, and therefore judicial review reforms are likely required to avoid lengthy delays.

Depending on the specific project, additional permitting requirements will likely apply. In its permitting report, the CEQ outlined all the federal permits that are potentially relevant to a CCS project. Alongside Class VI permits, operators may also need to obtain permits under the Clean Air Act, Clean Water Act, Endangered Species Act and other statutes.²⁹ Additionally, states would likely have their own siting regulations and permitting requirements for CO₂ pipelines. These additional requirements could further prolong the time required to implement CCS projects, threatening the ability of power generators to pursue EPA's proposed CCS pathway.

Similar linear infrastructure projects have faced significant permitting barriers and subsequent litigation, which have generated significant delays and even resulted in project cancellations. For example, in recent years, protracted and uncertain review processes have impacted at least five major natural gas infrastructure projects, with four projects eventually being cancelled after years of delay and billions of dollars in sunk costs.³⁰ Permitting delays affect the timely development of other linear infrastructure as well.³¹ The expansion of CO₂ pipeline infrastructure in the near term is critical to CCS project development and the viability of EPA's

²⁷ "Fiscal Responsibility Act of 2023," H.R. 3746, 118th Congress (2023). Available at: <https://www.congress.gov/bill/118th-congress/house-bill/3746>.

²⁸ "Mountain Valley Pipeline Halted as Legal Wrangling Heats Up." Coral Davenport. The New York Times. July 12, 2023. Available at: <https://www.nytimes.com/2023/07/12/climate/mountain-valley-pipeline-courts.html>.

²⁹ "Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration." Council on Environmental Quality. 2021. Available at: <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>.

³⁰ "API's 10 in '22: Quantification of Policy Impacts." Rystad Energy. November 1, 2022. Available at: <https://www.api.org/-/media/files/misc/rystad-energy-apis-10-in-2022-policy-plan-quantification-of-policy-impacts>.

³¹ "Transmission Permitting is Broken." American Energy Alliance. December 7, 2022. Available at: <https://www.americanenergyalliance.org/2022/12/transmission-permitting-is-broken/>.

proposed CCS pathway.³² If similar permitting obstacles and legal challenges remain for CO₂ pipelines, CO₂ infrastructure developers that are needed to support power generators would likely be unable to construct sufficient pipeline networks to enable compliance with EPA's proposed compliance deadline.

C. Pipeline Siting Authority

Another meaningful hurdle that must be addressed is the lack of a clear siting authority framework for interstate pipelines carrying CO₂. No federal agency has yet asserted authority over the siting of such pipelines, and there are conflicting understandings as to whether the Federal Energy Regulatory Commission (FERC) or the Surface Transportation Board (STB) have jurisdiction over the siting of interstate CO₂ pipelines.³³ However, various states are developing their own individual frameworks for regulating CO₂ pipelines. This evolving regulatory system could impede the efficient development of the large, interconnected network of CO₂ infrastructure that would be necessary for power generators to comply with EPA's proposal via the CCS pathway.

D. Pipeline and Hazardous Materials Safety Administration CO₂ Pipeline Regulations

As noted above, the U.S. currently has over 5,000 miles of CO₂ pipelines, primarily used by the oil and gas industry to transport CO₂ to support enhanced oil recovery.³⁴ These pipelines are a mature technology and have been used safely in the U.S at a commercial scale since 1972, adhering to existing Pipeline and Hazardous Materials Safety Administration (PHMSA) safety regulations.³⁵ While API welcomes additional practical measures that increase safety and public trust in CO₂ pipelines, the current evolving nature of safety regulations related to CO₂ pipelines presents a potential challenge in the near term as there is uncertainty around what form regulations will take. In May 2022, PHMSA announced that it would promulgate new measures to strengthen its safety oversight of CO₂ pipelines, beginning with a new rulemaking to update standards for

³² "Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration." Council on Environmental Quality. 2021. Available at: <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>.

³³ *Ibid.*

³⁴ "Carbon Dioxide Pipelines: Safety Issues." Paul Parfomak. Congressional Research Service. June 3, 2022. Available at: <https://crsreports.congress.gov/product/pdf/IN/IN11944>.

³⁵ "Decarbonization: Status, Challenges, and Policy Options for Carbon Capture, Utilization, and Storage. September 2022". Government Accountability Office. Available at: <https://www.gao.gov/assets/gao-22-105274.pdf>.

CO₂ pipelines, including requirements related to emergency preparedness and response.³⁶ Such regulations have not yet been proposed and must go through a public comment period before being finalized. While API is encouraged by PHMSA's acceleration of the timeline for the rulemaking, an incomplete understanding of what the final rule will contain could also contribute to delays in the construction of new CO₂ pipelines – an outcome that would limit the pace of CCS deployment just as power generators are beginning to make decisions about their compliance pathways.

The considerable time involved in the promulgation of these new PHMSA regulations for CO₂ pipelines is also impacting CCS deployment at the state level. In 2022, California Governor Newsom signed into law Senate Bill 905, which prohibits CO₂ from flowing through new pipelines until PHMSA finalizes its rulemaking on CO₂ pipeline safety.³⁷ This uncertainty surrounding the incoming PHMSA regulation's requirements and timeline would ultimately hinder the deployment of CO₂ pipelines and limit power generators' ability to prepare for compliance with the EPA proposal via the CCS pathway. API looks forward to continuing to work with PHMSA in this space.

E. Additional Non-regulatory Challenges to Developing Compliance Pathway Infrastructure

As a result of more public involvement in infrastructure permitting, the process has slowed. While there is broad government support for the development of linear infrastructure (including interstate CO₂ pipelines), individual projects have faced significant delays due to pockets of local opposition. Opposition groups are pursuing litigation and otherwise working to prevent the development of needed interstate pipelines and CCS projects, including by advocating for moratoria on the construction of CCS projects and pipelines.³⁸ In Louisiana, there have been many attempts to block CCS projects, with multiple bills proposing moratoria on carbon sequestration.³⁹ Additionally, while pipeline developers are typically able to successfully secure voluntary

³⁶ "PHMSA Announces New Safety Measures to Protect Americans from Carbon Dioxide Pipeline Failures after Satartia, MS Leak." Pipeline Hazardous Materials Safety Administration. May 26, 2022. Available at: <https://www.phmsa.dot.gov/news/phmsa-announces-new-safety-measures-protect-americans-carbon-dioxide-pipeline-failures>.

³⁷ California Senate Bill 905, "Carbon Sequestration: Carbon capture, Removal, Utilization and Storage Program." 2022. Available at: https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB905.

³⁸ "Groups call for carbon capture pipeline permits to be paused in Iowa." Donelle Eller. November 29, 2022. Available at: [Groups call for carbon capture pipeline permits to be paused in Iowa \(desmoinesregister.com\)](https://www.desmoinesregister.com/story/news/politics/2022/11/29/groups-call-for-carbon-capture-pipeline-permits-to-be-paused-in-iowa/7045187002/)

³⁹ "Limits on carbon capture quashed in Louisiana Legislature despite environmental concerns." Claire Sullivan. June 7, 2023. Available at: <https://lailluminator.com/2023/06/07/carbon-capture-louisiana/>.

agreements with landowners for pipeline rights-of-way through their properties, it is not unusual for a small number of landowners to oppose pipeline development.⁴⁰ This isolated local opposition from landowners and community groups is not solely focused on pipelines – other types of linear infrastructure experience similar delays.⁴¹ The considerable delays resulting from this type of opposition risk further restricting the expansion of CO₂ pipeline infrastructure and threatening the ability of power generators to comply with EPA’s proposal via the CCS pathway.

EPA and other agencies can support industry and play a constructive role in engaging these communities and developing better public understanding and support for CCS pipelines and projects. Through advocacy and education around the safety, climate benefits and potential economic opportunities of CCS, EPA can help avoid the delays resulting from local opposition to its deployment.

F. Geologic Storage

The oil and gas industry has significant experience developing and safely operating oil and gas reservoirs and can continue to leverage that technical expertise to geologically store CO₂. The U.S. has significant potential for geologic storage of CO₂, with enough suitable storage space to hold an estimated 3 billion metric tons of CO₂ per year.⁴² Carbon capture and storage projects supported by the U.S. Department of Energy and other organizations around the world, which injected more than 25 million metric tons of CO₂ in 2019 alone, have shown no adverse impacts to human health or the environment.⁴³ Despite these promising considerations, the time needed to develop storage and transportation infrastructure likely would conflict with EPA’s proposed timeline. Storage sites would likely face permitting obstacles like those that frequently impact other infrastructure projects, causing further delays and limiting power generators’ ability to utilize the CCS pathway.

⁴⁰ “Carbon Dioxide Pipelines: Safety Issues.” Paul Parfomak. Congressional Research Service. June 3, 2022. Available at: <https://crsreports.congress.gov/product/pdf/IN/IN11944>.

⁴¹ “Fierce local battles over power lines are a bottleneck for clean energy.” Catherine Clifford. June 26, 2022. Available at: <https://www.cnn.com/2022/06/26/why-the-us-has-a-massive-power-line-problem.html>.

⁴² “Carbon Transport and Storage Atlas and Data Resources.” National Energy Technology Laboratory. Available at: <https://netl.doe.gov/carbon-management/carbon-storage/atlas-data>.

⁴³ “Safe Geologic Storage of Captured Carbon Dioxide – DOE’s Carbon Storage R&D Program: Two Decades in Review.” National Energy Technology Laboratory, Pittsburgh. April 13, 2020. Available at: https://www.netl.doe.gov/sites/default/files/Safe%20Geologic%20Storage%20of%20Captured%20Carbon%20Dioxide%20April%2015%202020_FINAL.pdf.

At the individual facility level local geology may create barriers to implementing CCS. While facilities located near geologic storage sites can store their captured CO₂ in close proximity to the capture site, facilities planning to install CCS that are not located near suitable pore space will need to use pipelines to transport the gas to a site where it can be safely stored underground. This is widely recognized as a challenge, with CEQ noting in its report that “the scale of the existing pipeline network is insufficient in the context of a CCUS industry designed to contribute meaningfully to net-zero emissions goals across all industrial sectors.”⁴⁴

For example, the Archer Daniels Midland facility in Decatur, Illinois captures CO₂ from ethanol production. This facility is located in the Illinois Basin (a suitable location for underground geologic storage of CO₂), allowing captured CO₂ from the ethanol plant to be stored in the pore space below the facility and eliminating its reliance on CO₂ pipelines.⁴⁵ In contrast, DOE analysis suggests that large portions of the East Coast – particularly New England – are devoid of the type of viable local storage options available in Illinois, indicating that affected power generators in the region that opt for EPA’s proposed CCS pathway likely will have to rely on long-haul pipelines to transport CO₂ to suitable storage sites.⁴⁶ Therefore, policies that advance the development of a robust nationwide pipeline network will be needed for the cost-effective implementation of CCS at power generators that lack suitable local storage sites.

G. Environmental Justice

While power plants play a crucial role in providing electricity to meet the needs of societies and our economy, it is important to consider and mitigate potential environmental and social impacts associated with operating power plants and their related infrastructure to ensure sustainable and equitable energy development and to communicate this understanding effectively. With that goal in mind, the U.S. oil and natural gas industry acknowledges the importance of the environmental justice principles of fair treatment and meaningful involvement of all people, regardless of race, color, national origin or income. To achieve this, our industry recognizes the

⁴⁴ “Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration.” Council on Environmental Quality. 2021. Available at: <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>.

⁴⁵ “Illinois Industrial Carbon Capture and Storage Project.” Scott Macdonald. July 11, 2017. Available at: https://www.energy.gov/sites/prod/files/2017/10/f38/mcdonald_bioeconomy_2017.pdf.

⁴⁶ NATCARB Viewer 2.0. U.S. Department of Energy. Available at: <https://edx.netl.doe.gov/geocube/#natcarbviewer>

importance of understanding and addressing the potential impacts that power plants and other related infrastructure, including CCS projects, may have on surrounding communities. API and its member companies strive for safe and responsible operations that respect the communities and the environment where industry operates. API has previously discussed environmental justice as it relates to the Clean Air Act in its comments to EPA's *Proposed Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Source: Oil and Natural Gas Sector Climate Review, Including Appendix K and Social Cost of Greenhouse Gases* (Docket ID EPA-HQ-OAR-2021-0317, Feb. 13, 2023) and incorporates those comments by reference here.⁴⁷

In response to the EPA's request for public input on what assistance states and pertinent stakeholders may need in conducting meaningful engagement with affected communities, API acknowledges the crucial role of community and stakeholder engagement in our industry operations. API and its member companies actively engage in initiatives that support meaningful engagement with affected communities. As part of these efforts, API is currently developing a Recommended Practice (RP) aimed at enhancing public participation and community engagement processes that can be applied to various projects, including those related to implementing pipeline projects and engagement during the lengthy life cycle of CCS projects.

API would also emphasize the significance of using accurate and reliable data in the tools used to characterize communities, including those with potential EJ concerns; to that end, API recommends that EPA and other relevant agencies regularly update and validate the data sets used. Doing so will not only improve the mapping tool's accuracy in identifying environmental justice communities but also appropriately direct agencies' efforts to address those communities' concerns.

In addition, API suggests that EPA explore opportunities for alignment within its own agency and coordinate with other federal agencies involved in the permitting processes proposed in this rule, specifically when addressing environmental justice concerns. This alignment can lead to streamlined approaches to implementing community engagement strategies and offering clarity and predictability on expectations and requirements that need to be met. The alignment can also

⁴⁷ Docket ID EPA-HQ-OAR-2021-0317, Feb. 13, 2023

help reduce unnecessary administrative hurdles, foster collaboration, and create a more cohesive and effective approach to environmental justice efforts.

H. Project Financing

Implementation of CCS projects may require significant financing, requiring capital on the order of hundreds of millions of dollars.⁴⁸ Plant operators will need to secure this financing before they can begin installing CCS at their facilities, further complicating project timelines. To date, CCS deployment in the U.S. has occurred chiefly across lower-cost capture opportunities.⁴⁹

API is supportive of the tax credit in IRC 45Q for carbon sequestration, recognizing the credit as a critical enabler of CCS deployment. API is further encouraged by the recent enhancement of the credit through the IRA – our member companies have highlighted this as a key consideration in their CCS investment decisions. With this enhancement, CCS projects that begin construction prior to 2033 are eligible for the credit. Facilities can claim the tax credit over a twelve-year period beginning when the equipment is first placed into service.⁵⁰ However, there is significant uncertainty regarding how the expiration of the tax credit will impact the economics of individual CCS projects and therefore the ability for power generators to comply with EPA’s proposal. These questions surrounding the future economics of projects further contribute to the range of uncertainties impacting CCS deployment that power generators must account for when considering the proposed CCS pathway.

API is also supportive of DOE funding opportunities to advance the deployment and commercialization of CCS, many of which are directly referenced later in these comments. DOE should aim to ensure that these funds are expeditiously and responsibly allocated so that project operators can move more quickly in their execution of large-scale, capital-intensive projects.

I. State Regulatory Frameworks

Inconsistency between state regulatory frameworks further complicates the deployment of CCS. States vary in how they delineate pore space ownership, determining whether ownership

⁴⁸ “Unlocking Private Finance to Support CCS Investments.” Dominic Rassool. Global CCS Institute. 2021. Available at: <https://www.globalccsinstitute.com/wp-content/uploads/2022/01/Unlocking-Private-Finance-For-CCS-Thought-Leadership-Report-1-1.pdf>.

⁴⁹ *Ibid.*

⁵⁰ 26 U.S.C. §45Q. Available at: <https://www.govinfo.gov/content/pkg/USCODE-2021-title26/pdf/USCODE-2021-title26-subtitleA-chap1-subchapA-partIV-subpartD-sec45Q.pdf>.

rights over potential geological storage space are vested in the owners of the surface estate or in the owners of the mineral estate. Clarity of pore space ownership is critical to supporting the deployment of CCS. States are also taking different approaches to regulating the unitization of pore space owned by separate parties, establishing varying thresholds to determine the minimum percentage of property owners who must consent to a project for unitization. States also vary in how they regulate long-term liability, which determines what parties are responsible for the long-term risks of injected CO₂ after site closure. Some states are directing the state government to assume responsibility for the long-term stewardship of storage sites – states differ both in whether they transfer this liability to the state and in the timelines that they have established for the transfer. The inconsistency across state regulations risks further complicating the large-scale deployment of CCS, potentially creating additional delays for project developers.

I. Federal Action

API is encouraged by efforts made by Congress and federal agencies to support the at-scale deployment of CCS, including through funding opportunities, interagency coordination and resource documents. These efforts are critical to helping implement carbon capture projects, and API is eager to support the agencies in their development. Key efforts include:

- *Carbon Dioxide Transportation Infrastructure Finance and Innovation (CIFIA)*: The IJA appropriated \$2.1 billion for CIFIA for low-interest loans and grants to support the buildout of CO₂ transportation infrastructure.
- *Hydrogen Hubs*: IJA appropriated \$8 billion for the Regional Clean Hydrogen Hubs program – the applications selected for funding may include carbon capture, potentially also requiring the development of CO₂ pipelines.⁵¹
- *Direct Air Capture Hubs*: IJA provided \$3.5 billion for four Direct Air Capture (DAC) Hubs to demonstrate carbon dioxide removal technology. The hubs will demonstrate processing, transport, secure geologic storage, and/or conversion of CO₂ captured from the atmosphere with DAC technology and accelerate commercialization of those technologies.⁵²

⁵¹ “Carbon Dioxide (CO₂) Pipeline Development: Federal Initiatives.” Paul Parfomak. Congressional Research Service. June 2, 2023. Available at: <https://crsreports.congress.gov/product/pdf/IN/IN12169>.

⁵² “Regional Hubs to Demonstrate Value of Direct Air Capture Technologies for Decarbonization.” National Energy Technology Laboratory. March 20, 2023. Available at: <https://www.netl.doe.gov/node/12400>.

- *Class VI Primacy Grants*: IJA appropriated \$50 million to EPA to provide grants to states to defray the expenses related to the establishment and operation of a state underground injection control program.
- *Federal Class VI Funding*: IJA appropriated \$25 million over five years to EPA to support the federal permitting of Class VI wells.
- *CEQ CCUS Guidance*⁵³: Provides guidance on the facilitation of reviews associated with the deployment of CCUS projects and CO₂ pipelines, and aims to support the efficient, orderly, and responsible deployment of CCUS projects and CO₂ pipelines.
- *CEQ CCUS Report*⁵⁴: Recognizes that CCUS will be essential to meeting domestic climate goals, and highlights opportunities to accelerate CCUS deployment. The report also outlines relevant regulations, potential permitting requirements, and federal incentives.
- *EPA Class VI Permitting Report*⁵⁵: Provides recommendations to Congress to improve Class VI permitting procedures for CCS projects. The report outlines existing Class VI permitting requirements and processes and clarifies the permit application and review process.
- *CarbonSAFE*: Multi-year, multi-phase effort to characterize, permit, and construct commercial-scale CO₂ storage complexes with capacity to safely and securely store greater than 50 million metric tons of CO₂. At present, DOE is supporting five CarbonSAFE projects that are in the characterization and EPA UIC Class VI permitting phase.
- *Industrial Decarbonization Roadmap*: DOE's Industrial Decarbonization Roadmap identifies carbon capture, utilization, and storage as one of the four pillars of industrial decarbonization, recognizing the significant role that CCS will play in meeting U.S. climate goals.⁵⁶

⁵³ 87 FR at 8808.

⁵⁴ "Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration." Council on Environmental Quality. 2021. Available at: <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>.

⁵⁵ "EPA Report to Congress: Class VI Permitting." U.S. Environmental Protection Agency. October 2022. Available at: <https://www.epa.gov/system/files/documents/2022-11/EPA%20Class%20VI%20Permitting%20Report%20to%20Congress.pdf>.

⁵⁶ "Industrial Decarbonization Roadmap." U.S. Department of Energy. September 2022. Available at: <https://www.energy.gov/sites/default/files/2022-09/Industrial%20Decarbonization%20Roadmap.pdf>.

While API and its members are appreciative of these efforts and others designed to support the deployment of CCS, we remain concerned that the cumulative uncertainty associated with the challenges described here will likely impede power generators' ability to utilize the CCS pathway in accordance with EPA's proposed timeline. Accordingly, API urges EPA to coordinate with other agencies as necessary to address these challenges in a timely manner so that power generators can make confident investments in CCS in advance of the proposed 2035 compliance deadline. API supports a dedicated cross-agency effort to coordinate closely with industry and other stakeholders to develop a clear and realistic timeline for addressing and resolving the challenges laid out in these comments. Existing cross-agency initiatives, such as CEQ's taskforces on CCS permitting on federal and non-federal lands, should be activated immediately to address these issues and other items that would challenge the deployment of this technology at scale.⁵⁷ Additionally, given these numerous meaningful risks and the fact that much of the infrastructure development required to facilitate the broad use of CCS is outside of the control of power generators, API urges EPA to recognize that there may be instances in which power generators are unable to comply with the proposal via the CCS pathway or the hydrogen pathway.

⁵⁷ "CEQ Announces Members of Task Forces to Inform Responsible Development and Deployment of Carbon Capture, Utilization, and Sequestration." White House Press Release. March 24, 2023. Available at: <https://www.whitehouse.gov/ceq/news-updates/2023/03/24/ceq-announces-members-of-task-forces-to-inform-responsible-development-and-deployment-of-carbon-capture-utilization-and-sequestration/>.

V. Hydrogen

Under EPA’s proposed hydrogen pathway, the BSER for affected baseload gas-fired combustion turbines includes blending hydrogen at 30% and 96% by volume by 2032 and 2038, respectively. The 96% blend has an associated standard of 90 lbs. CO₂/MWh, which is equivalent to the standard under the CCS pathway. EPA further proposes that the hydrogen blended into the gas stream must have a greenhouse gas intensity of less than 0.45 kilograms CO₂ equivalent per kilogram H₂ (kg CO₂e/kg H₂) on a well-to-gate basis consistent with the system boundary established in IRC 45V, which established the tax credit for qualified clean hydrogen production as part of the IRA.⁵⁸ EPA has defined this as “low-GHG hydrogen.”

As noted above, EPA is proposing to require states to submit their SIPs by mid-2026. Under this schedule, generators who opt for the hydrogen pathway would have less than six years to begin blending significant quantities of low-GHG hydrogen at their facility, and just 12 years to convert their facility to one that is fueled almost entirely by low-GHG hydrogen. In order for this to be a viable option, considerable infrastructure to produce and transport low-GHG hydrogen must be developed by 2032. As is the case for the CCS pathway, there is significant uncertainty surrounding relevant permitting processes and regulations and the future availability of qualified low-GHG hydrogen and the pipeline infrastructure necessary to transport it. Additionally, there are technical concerns around the ability to blend meaningful quantities of hydrogen into existing natural gas pipelines. Such uncertainty would likely limit power generators’ ability and willingness to utilize the hydrogen pathway to comply with EPA’s proposal. Similar to CCS, API believes that the success of the hydrogen industry will depend on a clear and consistent regulatory framework; a definition of “clean hydrogen” that is consistent across industry and all of government that does not preclude certain production pathways; the broad acceptance of hydrogen as a means to reduce GHG emissions and – most importantly – a geographically and technologically diverse set of hydrogen hubs that leverages economies of scale to decrease costs.

A. Hydrogen Supply

A key hurdle to the ability of power generators to comply with EPA’s proposal via the hydrogen pathway by the 2032 and 2038 deadlines is the availability of sufficient quantities of

⁵⁸ 88 FR at 33304.

qualified low-GHG hydrogen. As noted above, EPA has proposed to define low-GHG hydrogen as hydrogen with a greenhouse gas intensity of less than 0.45 kg CO₂e/kg H₂ on a well-to-gate basis. EPA specifically notes that hydrogen produced via electrolysis that is powered by non-emitting energy sources like wind, solar, hydropower and nuclear can meet this standard,⁵⁹ though it is unlikely that hydrogen produced via natural gas utilizing CCS will be able to.

In August 2022 Congress passed the IRA, which among other things authorized IRC 45V, the Credit for Production of Clean Hydrogen.⁶⁰ IRC 45V provides tax credits for qualified hydrogen production with a well-to-gate greenhouse gas emissions intensity up to 4 kg CO₂e/kg H₂. Although EPA's proposed definition assumes the same system boundary of "well-to-gate", EPA has effectively limited qualifying low-GHG hydrogen to the strictest tier of hydrogen supply under IRC 45V. API objects to this approach as it effectively gives preference to one technology at the expense of broader emissions reductions that all forms of qualified clean hydrogen can provide, regardless of production pathway.

Accordingly, API urges EPA to align its GHG emission intensity threshold for low-GHG hydrogen in this rulemaking with that of Congress, DOE and the Treasury Department. IRC 45V makes clear that Congress views all hydrogen production with a greenhouse gas emissions intensity up to 4 CO₂e/kg H₂ as qualified clean hydrogen, and therefore API believes it would be inappropriate for EPA to develop its own definition. EPA's proposed approach would also create a confusing environment in which various agencies across the federal government accept different GHG intensity thresholds. The impacts this could have on the growth of a clean hydrogen economy could be consequential. Further, the development of a hydrogen market is in its early stages and therefore it is important that federal agencies harmonize to support its growth if the U.S. is to meet the Biden Administration's goals for emissions reductions across sectors.

The adoption of a stricter definition of low-GHG hydrogen by EPA risks stifling hydrogen production and potentially the broader hydrogen economy. DOE recognized this risk in aligning its emissions target with that of the IRC 45V, noting in its CHPS guidance that the target "will

⁵⁹ 88 FR at 33304.

⁶⁰ Inflation Reduction Act, H.R. 5376, 117th Congress (2022). <https://www.congress.gov/bill/117th-congress/house-bill/5376/text>.

encourage low-carbon hydrogen production from diverse feedstocks and using state-of-the-art technologies that are expected to be deployable at scale today.”⁶¹

API agrees with DOE’s observation and urges EPA to recognize that aligning its proposed low-GHG emission threshold with that of Congress and DOE will stimulate a larger supply of hydrogen, allow for the blending of clean hydrogen from various production sources in pure hydrogen pipeline networks and facilitate more GHG emissions reductions. A 2022 study conducted by ICF International, a global energy consulting firm, echoes this contention. The study found that the lack of a level playing field for various hydrogen production methods would result in “higher hydrogen prices, smaller hydrogen markets, higher mitigation costs and greater overall GHG emissions.” API urges EPA to adopt a carbon intensity threshold that is technology-neutral, allowing all forms of clean hydrogen that reduce GHG emissions a chance to supply the power sector.

Further, given the significant buildout of dedicated hydrogen pipelines that likely will be required to achieve the blending requirements in EPA’s proposal, a definition of clean hydrogen that is inconsistent with that of IRC 45V could limit the availability of pipelines moving hydrogen that qualify with the stricter threshold. In a nascent market it is unlikely that multiple pipelines carrying different carbon intensity hydrogen will be readily available. In an open pipeline network, all hydrogen molecules are treated the same and molecules from specific production sources cannot be traced back to a facility. Under EPA’s proposed rule, power generators may not be able to benefit from the future buildout of open pipeline networks (such as those within the Regional Clean Hydrogen Hubs Program) that may serve other sectors utilizing all low-carbon hydrogen as defined up to 4 kg CO₂e/kg H₂.

Additionally, API is concerned that if EPA defines qualifying hydrogen too narrowly, power generators would likely be faced with insufficient supply that will complicate their efforts to comply with EPA’s proposed rule via the hydrogen pathway by the 2032 and 2038 deadlines. In its *Pathways to Commercial Liftoff: Clean Hydrogen* report, DOE found that by 2050 “reformation-based hydrogen with CCS may account for 50-80% of total U.S. hydrogen

⁶¹ “U.S. Department of Energy Clean Hydrogen Production Standard Guidance.” U.S. Department of Energy. Available at: <https://www.hydrogen.energy.gov/pdfs/clean-hydrogen-production-standard-guidance.pdf> at 2-3.

production.”⁶² If the vast majority of available clean hydrogen will not qualify for compliance with EPA’s proposal, it would complicate power generators’ compliance efforts and undermine the development of the broader clean hydrogen economy.

Separately, API encourages EPA to adopt the Treasury Department’s guidance on carbon intensity accounting as well as monitoring, reporting, and verification (MRV) requirements so that there is consistency across the clean hydrogen marketplace for how to calculate GHG intensity of hydrogen. For example, if EPA independently designs its own set of carbon intensity protocols, it could result in hydrogen volumes that achieve different carbon intensity scores under the accounting method used by the Treasury Department for the IRC 45V tax credit versus that used by EPA for the proposed rule. Given that the Treasury Department has yet to release its official guidance on carbon intensity protocols for IRC 45V, API believes it would be inappropriate for EPA to consider designing an independent protocol. In November 2022 API provided the Treasury Department with detailed comments on the implementation of IRC 45V, including our positions for the use of indirect book accounting measures, definition of clean hydrogen, the functionality of the GREET model, and other significant components of IRC 45V’s implementation.⁶³ Though guidance has yet to be released, API continues to monitor the debates and publication of studies on the emissions impact of book and claim accounting approaches, also known as "indirect book accounting factors" with respect to the use of renewable energy credits (RECs), certified gas credits and other energy attribute certificates. Book and claim market structures are essential for the growth of a low-carbon economy, including a low-carbon hydrogen supply, and represent an opportunity to drive down emissions across the hydrogen production value chain in a flexible way by allowing producers to leverage the environmental attributes of low or zero-emitting resources in a traceable marketplace. However, the availability within energy attribute markets remains limited and therefore near-term rules governing the use of book and claim should consider flexibility and phased approaches that allow the market to scale.

⁶² “Pathways to Commercial Liftoff: Clean Hydrogen.” Hannah Murdoch et al. U.S. Department of Energy. March 2023. Available at: <https://liftoff.energy.gov/wp-content/uploads/2023/03/20230320-Liftoff-Clean-H2-vPUB.pdf> at 11.

⁶³ API submitted comments on IRS Notice 2022-58 on Credits for Clean Hydrogen and Clean Fuel Production. Available at: <https://www.regulations.gov/comment/IRS-2022-0029-0137>.

B. Pipeline Siting Authority

Another meaningful hurdle to the buildout of a national hydrogen pipeline network is the lack of a clear siting authority framework for many potential hydrogen pipelines. Currently, no federal agency has that authority.⁶⁴ Additionally, unlike natural gas pipelines, developers of interstate hydrogen pipelines may also be forced to seek separate approvals, such as a certificate of public convenience and necessity, from each of the states that the proposed pipeline would pass through.⁶⁵ In light of the size and geographic concentration of the existing hydrogen pipeline network—roughly 1,600 miles of dedicated hydrogen pipelines in the U.S., mainly in the Gulf Coast region—EPA should not assume that established or to-be-established siting authorities will be able to efficiently permit the large network of dedicated hydrogen pipelines that would need to be rapidly developed to facilitate compliance with EPA’s proposed rule via the hydrogen pathway.

C. Permitting Requirements

New hydrogen infrastructure, namely pipelines and appurtenant facilities, may be subject to several federal permitting regimes. An October 2020 report on the future of hydrogen noted that new dedicated hydrogen pipelines may require permits under the Clean Water Act, the Rivers and Harbors Act and the Endangered Species Act, as well as environmental review under NEPA. State water quality certifications and other state permits may also be required.⁶⁶ These complex permitting requirements, many of which are often subject to litigation, would likely slow the development of dedicated hydrogen pipelines and risk undermining the viability of EPA’s proposed hydrogen pathway. As noted in the CCS section, a recent CEQ analysis found that the average EIS under NEPA took four-and-a-half years. Given the extremely short period in which hydrogen pipelines must be developed to support compliance with EPA’s proposed hydrogen pathway, the prospect of lengthy permitting processes would likely result in power generators opting for an alternative compliance pathway such as operating less frequently, or even opt for shutting down.

⁶⁴ “Pipeline Transportation of Hydrogen: Regulation, Research, and Policy.” Paul Parfomak. Congressional Research Service. March 2, 2021. Available at: <https://crsreports.congress.gov/product/pdf/R/R46700> at 9.

⁶⁵ *Id.*, at 9.

⁶⁶ “The H₂ Handbook.” K&L Gates. Available at: <https://marketingstoragerags.blob.core.windows.net/webfiles/Hydrogen-Handbook-UNITEDSTATES.pdf> at 54.

D. Hydrogen Storage

Another essential component of the hydrogen supply chain is storage, which will be critical to balancing fluctuations in demand. Hydrogen has been stored in dedicated hydrogen pipelines, underground storage caverns, and in pressurized tankers for decades, however large-scale commercial deployment doesn't exist in many regions of the U.S. The majority of today's 10 million metric tons of hydrogen produced annually is stored within dedicated hydrogen pipeline networks, which remains the most flexible option for high volumes of hydrogen. For long-term bulk storage of large amounts of gaseous hydrogen, underground salt caverns are an option and can serve as a backup for pipeline networks. In the U.S., hydrogen has been stored in salt caverns since the 1980s, however the relative scarcity of salt deposits is a limiting factor at present. Commercial projects in the U.S. remain constrained by geography, with only three existing commercial projects along the Gulf Coast.⁶⁷ API is encouraged by DOE's funding for the Subsurface Hydrogen Assessment, Storage and Technology Acceleration (SHASTA)⁶⁸ program, which focuses on large-scale hydrogen underground storage, though it is currently unclear when large-scale hydrogen storage that facilitates the broad adoption of the fuel will be available.

E. State Issues

Another key issue that may negatively impact power generators' ability to comply with EPA's proposed rule via the hydrogen pathway is states' unwillingness to allow the combustion of hydrogen. In 2021, New York's Department of Environmental Conservation (DEC) denied permits for two gas-fired power plants that were requesting permission to repower. In the long term, both plants had proposed to convert to hydrogen or renewable natural gas (RNG) to comply with the state's Climate Leadership and Community Protection Act, which requires 100% carbon-free power generation by 2040. DEC's decision included skepticism around the use of hydrogen in combustion turbines, noting that the plant operator "has not established the feasibility of either RNG or hydrogen as a compliance pathway, from either a supply or GHG perspective."⁶⁹ The DEC

⁶⁷ "Underground Hydrogen Storage." Gaffney Cline. Available at: https://www.gaffneycline.com/sites/g/files/cozyhq681/files/2022-07/gaffneycline_underground_hydrogen_storage_article.pdf.

⁶⁸ SHASTA Program. U.S. Department of Energy. Available at: <https://edx.netl.doe.gov/shasta/>

⁶⁹ "Notice of Denial of Title V Air Permit." New York State Department of Environmental Conservation. October 27, 2021. Available at: https://www.dec.ny.gov/docs/administration_pdf/nrgastoriadecision10272021.pdf%20at%2012 at 12.

went on to raise concerns around the potentially higher nitrous oxide emissions associated with hydrogen's higher flame temperature.

Skepticism from state regulators around the blending of hydrogen may force gas-fired generators to opt for other compliance pathways. In this case, New York's unsuitable geology for geologic storage of CO₂ may also prevent generators from opting for the CCS pathway, potentially forcing them to operate less or retire. A similar issue arose in Oregon earlier in 2023, with the state's Public Utility Commission expressing skepticism about a plan by its largest gas utility to reduce emissions by blending hydrogen into its natural gas infrastructure.⁷⁰

F. Gas composition and hydrogen blending

In the face of uncertain jurisdictional, regulatory and logistical questions around dedicated hydrogen pipelines, API members and other stakeholders have identified the blending of hydrogen into existing natural gas pipelines as a potentially near-term, low-cost opportunity. However, as noted in a March 2021 report on hydrogen pipeline transportation issues by the Congressional Research Service, this option raises several significant regulatory and technical questions including FERC's regulation of gas quality and composition.⁷¹ The aforementioned 2020 report on hydrogen echoes this concern, identifying gas composition issues as "one of the most significant challenges" facing the nascent industry.⁷² FERC has the authority to regulate gas quality and interchangeability standards, but "most interstate natural gas pipeline operators do not have specifications for hydrogen content in their tariffs; conversely, most tariffs likely give operators the discretion to exclude significant hydrogen concentrations from their systems."⁷³ Without clear standards for blending hydrogen into existing interstate natural gas pipelines, it would be extremely difficult for power generators to source the hydrogen they will need beginning in 2032 to comply with EPA's proposal.

⁷⁰ "NW Natural plan to reduce emissions deemed insufficient by Oregon utility regulators." Monica Samayoa and Ryan Haas. June 6, 2023. Available at: <https://www.opb.org/article/2023/06/06/oregon-utility-regulators-say-nw-natural-gas-plan-to-reduce-emissions-insufficient/>

⁷¹ "Pipeline Transportation of Hydrogen: Regulation, Research, and Policy." Paul Parfomak. Congressional Research Service. March 2, 2021. Available at: <https://crsreports.congress.gov/product/pdf/R/R46700>

⁷² "The H₂ Handbook." K&L Gates. Available at: <https://marketingstoragerags.blob.core.windows.net/webfiles/Hydrogen-Handbook-UNITEDSTATES.pdf> at 56.

⁷³ "Pipeline Transportation of Hydrogen: Regulation, Research, and Policy." Paul Parfomak. Congressional Research Service. March 2, 2021. Available at: <https://crsreports.congress.gov/product/pdf/R/R46700> at 20.

In addition to gas quality standards, there are technical hurdles to blending hydrogen into natural gas pipelines. DOE's Hydrogen and Fuel Cell Technology Office (HFCTO), which is housed within its Office of Energy Efficiency and Renewable Energy (EERE), noted in a recent technical summary of its HyBlend initiative that blend limits are a function of many factors including pipeline materials, design and compatibility of components like compressor stations and end-use applications. DOE's review of recent deployments and announced demonstrations found that blend limits range from less than 1% up to 30%.⁷⁴ While a 30% blend limit could ostensibly allow power generators to meet the initial 2032 blending requirements in EPA's proposed hydrogen pathway, not all power generators have access to pipelines capable of transporting that blend. Further, a 30% blend limit is significantly below what would be required to meet the final blending requirement of 96% in the hydrogen pathway. API is encouraged by DOE's continued research into hydrogen blending opportunities, costs and risks and urges EPA to engage in this effort to better understand the ability of power generators to comply with the proposed rule by the 2032 and 2038 deadlines.

Finally, API urges EPA to acknowledge that many gas-fired power generators are served by Local Distribution Companies (LDCs) that also serve other customers including residential and commercial consumers, under an obligation to serve, and therefore their ability to procure the natural gas with the required hydrogen blend may be restricted by the needs and limitations of the LDC's other customers. This could block certain power generators from utilizing EPA's proposed hydrogen pathway.

G. Federal Action

Similar to CCS, API is encouraged by the numerous efforts undertaken by Congress and various federal agencies to advance the clean hydrogen economy. API is eager to continue supporting these policies. Key efforts include:

- *Hydrogen Hubs*: IJIA included \$8 billion for Regional Clean Hydrogen Hubs to support the development of networks of clean hydrogen producers, potential consumers, and connective infrastructure. These regional hubs aim to advance the production, processing,

⁷⁴ "HyBlend: Opportunities for Hydrogen Blending in Natural Gas Pipelines." U.S. Department of Energy. Available at: <https://www.energy.gov/sites/default/files/2022-12/hyblend-tech-summary-120722.pdf>

delivery, storage, and end-use of clean hydrogen, including innovative uses in the industrial sector.⁷⁵

- *Demand-Side Initiative:* IIJA also included a separate \$1 billion initiative to develop an independent implementing entity aimed at addressing the lack of market certainty for clean hydrogen under the law's hydrogen hubs program and to help facilitate private sector financing where bottlenecks exist today.⁷⁶
- *IRC 45V Tax Credit:* IRA created a new ten-year tax credit for clean hydrogen production that ranges from \$0.60-\$3.00 per kilogram of hydrogen based on carbon intensity.⁷⁷
- *Clean Hydrogen Electrolysis Program:* IIJA appropriated \$1 billion to establish a research, development, demonstration, commercialization, and deployment program for purposes of

⁷⁵ “Regional Clean Hydrogen Hubs.” U.S. Department of Energy. Available at:

<https://www.energy.gov/oced/regional-clean-hydrogen-hubs>.

⁷⁶ “Biden-Harris Administration to Jumpstart Clean Hydrogen Economy with New Initiative to Provide Market Certainty And Unlock Private Investment.” U.S. Department of Energy. July 5, 2023. Available at:

<https://www.energy.gov/articles/biden-harris-administration-jumpstart-clean-hydrogen-economy-new-initiative-provide-market#:~:text=WASHINGTON%2C%20D.C.%20%E2%80%94%20As%20part%20of,the%20Regional%20Clean%20Hydrogen%20Hubs%20>

⁷⁷ Inflation Reduction Act, H.R. 5376, 117th Congress (2022). <https://www.congress.gov/bill/117th-congress/house-bill/5376/text>.

commercialization to improve the efficiency, increase the durability, and reduce the cost of producing clean hydrogen using electrolyzers.⁷⁸

- *Clean Hydrogen Manufacturing Recycling Program*: IJIA allocated \$500 million to provide federal financial assistance to advance new clean hydrogen production, processing, delivery, storage, and use equipment manufacturing technologies and techniques.⁷⁹
- *Hydrogen Shot*: The Hydrogen Shot establishes a framework and foundation for clean hydrogen deployment to meet DOE’s goal of reducing the cost of clean hydrogen by 80% to \$1 per 1 kilogram in one decade.⁸⁰
- *HyBlend*: DOE’s HyBlend initiative aims to address technical barriers to blending hydrogen in natural gas pipelines. Key aspects of HyBlend include materials compatibility R&D, techno-economic analysis, and life cycle analysis that will inform the development of publicly accessible tools.⁸¹
- *Hydrogen and Fuel Cells Interagency Working Group*: The Hydrogen and Fuel Cells Interagency Working Group consists of multiple federal agencies that exchange information about hydrogen and fuel cell research, development, and demonstration projects and collaborate on related activities. Representatives from the participating agencies meet regularly to share research results, technical expertise, and lessons learned about program implementation, technology development, and deployment.⁸²
- *DOE National Clean Hydrogen Strategy and Roadmap*: DOE’s Roadmap explores opportunities for clean hydrogen to contribute to national decarbonization goals and

⁷⁸ “Clean Hydrogen Electrolysis Program.” U.S. Department of Energy. Available at: <https://www.energy.gov/eere/clean-hydrogen-electrolysis-program>.

⁷⁹ “Clean Hydrogen Manufacturing Recycling.” U.S. Department of Energy. Available at: <https://www.energy.gov/eere/clean-hydrogen-manufacturing-recycling#:~:text=The%20Clean%20Hydrogen%20Manufacturing%20Recycling,equipment%20manufacturing%20technologies%20and%20techniques>.

⁸⁰ “Hydrogen Shot.” U.S. Department of Energy. Available at: <https://www.energy.gov/eere/fuelcells/hydrogen-shot>.

⁸¹ “HyBlend: Opportunities for Hydrogen Blending in Natural Gas Pipelines.” U.S. Department of Energy. Available at: <https://www.energy.gov/eere/fuelcells/hyblend-opportunities-hydrogen-blending-natural-gas-pipelines>.

⁸² “Hydrogen and Fuel Cells Interagency Working Group.” U.S. Department of Energy. Available at: <https://www.hydrogen.energy.gov/hfciwg.html>.

presents a strategic framework for achieving large-scale production and use of clean hydrogen, identifying the need for collaboration across sectors.⁸³

- *Pathways to Commercial Liftoff - Clean Hydrogen*: DOE prepared a report to establish a common fact base and ongoing dialogue with the private sector around the path to commercial liftoff for critical clean energy technologies with the goal of catalyzing more rapid and coordinated action across the full technology value chain.⁸⁴

While API appreciates these efforts, it remains concerned that the significant challenges described here would undermine the viability of EPA’s proposed hydrogen pathway – especially given the rapid compliance timeline. Accordingly, API urges EPA to coordinate with industry and other relevant agencies to resolve these challenges as expeditiously as possible so that power generators can make confident decisions in their compliance pathways. Additionally, API strongly urges EPA to adopt the definition of clean hydrogen established by Congress in IRC 45V to facilitate the production of sufficient quantities of clean hydrogen and avoid unnecessarily bifurcating the nascent clean hydrogen market and potentially undermining its value in reducing emissions.

⁸³ “U.S. National Clean Hydrogen Roadmap and Strategy.” U.S. Department of Energy. Available at: <https://www.hydrogen.energy.gov/clean-hydrogen-strategy-roadmap.html>.

⁸⁴ “Pathways to Commercial Liftoff: Clean Hydrogen.” Hannah Murdoch et al. U.S. Department of Energy. March 2023. Available at: <https://liftoff.energy.gov/wp-content/uploads/2023/03/20230320-Liftoff-Clean-H2-vPUB.pdf> at 11.

VI. Reliability

Gas-fired power generators have become critical to maintaining the reliability of the bulk power grid as the share of variable energy resources, including wind and solar, has grown. This notion has been echoed by grid operators, electric utilities and regulatory authorities, who note that the flexibility and dispatchability characteristics of gas-fired generators will be important to balance the grid amid the energy transition. However, API is concerned that EPA's proposed rule could drive many of these generators into premature retirement if not all the hurdles associated with developing the infrastructure needed to support CCS and hydrogen are resolved in a timely manner.

Because EPA's modeling of the proposed rule assumed that all infrastructure necessary to comply via the CCS pathway and hydrogen pathway – including but not limited to CO₂ pipelines, CO₂ sequestration facilities, hydrogen production facilities and hydrogen pipelines – was readily available, potential reliability risks related to the lack of sufficient infrastructure likely were not captured. Affected power generators who cannot access the needed infrastructure and, in the case of the hydrogen pathway, a stable and affordable supply of hydrogen may be forced to comply with EPA's proposed rule via other means, namely by operating less or retiring. This outcome could have a devastating impact on grid reliability, particularly if it coincides with strong expected growth in demand for electricity and continued pressure on the coal generating fleet. Accordingly, API urges EPA to more comprehensively analyze the potential reliability risks that the proposed rule presents, including those associated with the required infrastructure buildout.

A. Gas Plants' Contribution to CO₂ Emission Reductions

The increased use of natural gas for power generation in the U.S. has driven significant CO₂ emission reductions. As API noted in its comments in the non-rulemaking docket preceding this rulemaking,⁸⁵ the switch from coal to natural gas for power generation has contributed to a 40% decline in carbon dioxide emissions from the power sector since 2005.⁸⁶ According to the

⁸⁵ API submitted comments on Docket ID No. EPA-HQ-OAR-2022-0723 on Reducing Greenhouse Gas Emissions from New and Existing Fossil Fuel-Fired Electric Generating Units. Available at: <https://www.regulations.gov/comment/EPA-HQ-OAR-2022-0723-0044>.

⁸⁶ "Monthly Energy Review." Energy Information Administration. Available at: <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> at 219.

U.S. Energy Information Administration (EIA), coal-to-gas switching was responsible for roughly two-thirds of the power sector CO₂ emission reductions between 2005 and 2019.⁸⁷ The lower carbon intensity of natural gas versus coal as well as advancements in gas turbine efficiency that yield less carbon dioxide per unit of electricity generated enabled these reductions. In fact, the newest gas-fired generators that have entered service in the U.S. boast CO₂ emission rates of just over 700 pounds of lbs. CO₂/MWh, which is roughly 65% below that of the average coal plant.⁸⁸

Notably, these CO₂ emissions reductions have outpaced the goals of ambitious decarbonization efforts promulgated by recent administrations. The Clean Power Plan (CPP), which was finalized in 2015 by the administration of President Barack Obama, aimed to reduce CO₂ emissions from the power sector 32% by 2030 relative to 2005 levels.⁸⁹ While the CPP was eventually repealed, incremental coal to gas switching continued to drive down CO₂ emissions. By 2021, power sector CO₂ emissions were 40% below 2005 levels⁹⁰ – largely because of the continued switch from coal to natural gas.⁹¹

As noted in API's previous filing,⁹² a recent study white paper that examines strategies to achieve the Biden Administration's target of a 50-52% decrease in economy-wide greenhouse gas emissions by 2030, the Electric Power Research Institute (EPRI) contends that firm capacity – like that provided by gas-fired generators – is critical to maintaining a reliable system amid the energy transition. EPRI goes on to list the benefits of gas-fired generation, including “helping to offset coal retirements, providing firm capacity to aid in balancing variable renewables, ensuring that supply can meet growing demand in every hour, minimizing electricity cost increases, and reducing system operational changes.”⁹³ Accordingly, API urges EPA to recognize that any

⁸⁷ [U.S. Energy Information Administration - EIA - Independent Statistics and Analysis](#)

⁸⁸ Assumptions: Gas plants: heat rate of 6.0 MMBTU/MWh and a fuel carbon content of 117 lbs. CO₂/MMBTU. Coal plants: heat rate of 10.5 MMBTU/MWh and a fuel carbon content of 205 lbs. CO₂/MMBTU.

⁸⁹ President Obama's Climate Action Plan. Available at: <https://obamawhitehouse.archives.gov/president-obama-climate-action-plan>

⁹⁰ “Monthly Energy Review.” Energy Information Administration. Available at: <https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf> at 213.

⁹¹ “Electric power sector CO₂ emissions drop as generation mix shifts from coal to natural gas.” Energy Information Administration. Available at: <https://www.eia.gov/todayinenergy/detail.php?id=48296>

⁹² API submitted comments on Docket ID No. EPA-HQ-OAR-2022-0723 on Reducing Greenhouse Gas Emissions from New and Existing Fossil Fuel-Fired Electric Generating Units. Available at: <https://www.regulations.gov/comment/EPA-HQ-OAR-2022-0723-0044>.

⁹³ “Strategies and Actions for Achieving a 50% Reduction in U.S. Greenhouse Gas Emissions by 2030.” Electric Power Research Institute. November 2021. Available at: <http://mydocs.epri.com/docs/public/EPRI-Whitepaper-Strategies-and-Actions-for-US-GHG-Reduction.pdf>.

measure that impedes the operations of critical gas-fired generators could negatively impact grid reliability and hinder decarbonization efforts.

B. Growing Demand for Electricity

Demand for electricity is widely expected to accelerate over the coming decades due to both policy and economic drivers. Looking ahead, however, the potential for broad electrification of cooking, heating and transportation and continued development of energy-intensive data centers are projected to drive strong growth that may challenge power grids. This growth could be pronounced in certain markets that cover states with aggressive electrification targets. For example, the New York Independent System Operator (NYISO), which operates the grid serving New York State, projects that demand for electricity could double by 2050 as a result of state policies around electric vehicles, building electrification and hydrogen produced via electrolysis.⁹⁴ Similarly, the Independent System Operator of New England (ISO-NE), which manages the grid serving Massachusetts, New Hampshire, Connecticut, Rhode Island, Vermont and Maine, forecasts that the demand associated with the electrification of heating and transportation in its territory could surge more than 4,500% over the next decade.⁹⁵

The PJM Interconnect (PJM), the grid operator serving all or parts of 13 states plus the District of Columbia, has highlighted data centers as a primary contributor to load growth in the coming years. PJM noted in a recent report on grid reliability that it “is witnessing a large growth in data center activity”⁹⁶ and that this trend could drive demand growth as high as 7% annually in certain parts of its footprint.⁹⁷ Notably, these forecasts were produced before EPA released its recently-proposed emission standards for light, medium, and heavy duty vehicles, which could

⁹⁴ “2023 Load & Capacity Data.” New York ISO. 2023. Available at

<https://www.nyiso.com/documents/20142/2226333/2023-Gold-Book-Public.pdf>. 22.

⁹⁵ “2023 Forecast Report of Capacity, Energy, Loads, and Transmission.” ISO New England. May 2023. Available at: <https://www.iso-ne.com/system-planning/system-plans-studies/celt>

⁹⁶ “Energy Transition in PJM: Resource Retirements, Replacements & Risks.” PJM. February 24, 2023. Available at: <https://www.pjm.com/-/media/library/reports-notice/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx> at 14.

⁹⁷ *Ibid*, at 2.

result in increased demand for electric vehicles over the next decade and potentially exacerbate reliability issues.

While growing electricity demand does not necessarily present a problem on its own, serious challenges can arise when it coincides with a decline in the supply of reliable electricity. API remains concerned that if all the CCS and hydrogen infrastructure challenges noted above are not resolved in a timely manner, critical power generators will be at risk of being forced to reduce dispatch or retire prematurely at a time when demand for electricity is growing – an outcome that could be devastating for grid reliability. Accordingly, API urges EPA to fully consider the potential reliability impact of this proposed rulemaking, particularly in light of the likelihood for rising electricity demand and the existing challenges that power generators face.

C. Premature Retirement Risks

As noted previously, API is concerned that gas-fired power generators are at risk of being forced out of the market just as electricity demand growth is expected to accelerate. PJM and other grid operators echo this concern. NYISO wrote in a recent report that “Reliability margins are shrinking. Generators needed for reliability are planning to retire.”⁹⁸ Similarly, PJM identified government policies as a key driver of the rapid pace of generator retirements that are increasing reliability risks.⁹⁹ Reliability regulators have also warned of looming issues. The North American Electric Reliability Corporation (NERC), the non-profit regulatory authority that oversees grid reliability across the U.S. and parts of Canada and Mexico, concluded in its most recent Long-Term Reliability Assessment that the pace of generation retirements must be managed to avoid “energy risks or the loss of necessary sources of system inertia and frequency stabilization that are essential for a reliable grid.”¹⁰⁰ FERC Chairman Phillips voiced similar worries during a May 2023 hearing on threats to electric reliability before the Senate Committee on Energy and Natural Resources, noting that he is “extremely concerned when it comes to the pace of retirements that

⁹⁸ “Power Trends 2022.” New York ISO. 2022. Available at:

<https://www.nyiso.com/documents/20142/2223020/2022-Power-Trends-Report.pdf/d1f9eca5-b278-c445-2f3f-edd959611903?t=1654689893527> at 5.

⁹⁹ “Energy Transition in PJM: Resource Retirements, Replacements & Risks.” PJM. February 24, 2023. Available at: <https://www.pjm.com/-/media/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx> at 1.

¹⁰⁰ “2022 Long-Term Reliability Assessment.” North American Reliability Corporation. Available at: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf at 7.

we are seeing of generators that we need for reliability on our system.”¹⁰¹ Commissioners Danly and Christie have also echoed this concern. Given FERC’s duty to protect electric reliability, API believes it is appropriate for EPA to coordinate closely with FERC to fully understand the reliability implications of its proposed rule. This coordination is consistent with efforts made during the development of the CPP, which included four technical conferences at FERC that examined the proposed rule’s potential impacts on grid reliability.¹⁰²

D. Cumulative Uncertainty

Compliance with EPA’s proposal via the CCS pathway or the hydrogen pathway presents significant risks, especially given the tight timeline. As noted above, there are a multitude of challenges that must be resolved in short order for either pathway to be viable, and nearly all of those challenges are out of the hands of power generators. Given the lengthy lead time associated with integrating CCS or hydrogen at existing plants and the short timetable EPA has proposed, owners of power generators must make decisions quickly about their compliance strategy.

Remaining uncertainty around the rapid expansion of CCS and hydrogen infrastructure, the future availability of qualifying clean hydrogen and the cost to retrofit their plants with BSER and BACT/LAER controls and operate them under these new conditions may force owners of affected power generators to opt for other compliance pathways, including reduced dispatch, or even opt for premature retirement. Both these options involve the loss of dispatchable generation that could jeopardize grid reliability.

For EPA’s proposed hydrogen pathway, the availability and cost of sufficient quantities of qualifying hydrogen is likely to be a key uncertainty for power generators. EPA has proposed to define qualifying hydrogen as that with a well-to-gate emission rate of 0.45 kg CO₂e/kg H₂, well below the 4.0 kg CO₂e/kg H₂ that Congress stipulated in IRC 45V. API is concerned that this stricter proposed definition could result in a mismatch in supply and demand of qualifying hydrogen that drives hydrogen prices up to a level that makes power generation uneconomic. EPA’s analysis did not account for this significant risk, instead assuming that power generators’ cost of qualifying delivered hydrogen was just \$1 per kilogram through 2035, and \$0.50 per

¹⁰¹ Senate Committee on Energy and Natural Resources. FERC oversight hearing. May 4, 2023.

¹⁰² “FERC technical conferences examining EPA Clean Power Plan are underway.” JD Supra. February 2015. Available at: <https://www.jdsupra.com/legalnews/ferc-technical-conferences-examining-epa-32190/>

kilogram thereafter.¹⁰³ However, like most other commodities, hydrogen is likely to have a market price that reflects the supply-demand balance. While power generators may be able to mitigate some of this by signing contracts for qualifying hydrogen, it is unclear whether there will be sufficient dedicated infrastructure to move hydrogen that qualifies under EPA’s definition. This significant uncertainty could make power generators hesitant to pursue the hydrogen pathway.

E. Challenges of the “Reduced Dispatch” Pathway

EPA has proposed to exempt gas-fired power generators greater than 300 MW that operate at an annual capacity factor under 50% from any compliance requirements. This means that owners of power generators could simply operate less frequently to avoid pursuing the CCS pathway or the hydrogen pathway. However, this reduced dispatch compliance pathway may run afoul of market rules in certain regions of the U.S.

For example, power generators in ISOs with a capacity market often must dispatch when called upon by the grid operator if they have cleared in the capacity auction. This implies that gas-fired power generators that opt to reduce dispatch in order to comply with EPA’s proposed rule may be unable to participate in capacity auctions given that their dispatch may be limited by the need to keep their annual capacity factor under 50%. In PJM, the capacity market has a must-offer requirement, meaning all capacity resources, with the exception of intermittent and storage resources, must offer into the capacity auction.¹⁰⁴ To comply with this must-offer requirement while maintaining an annual capacity factor under 50%, gas-fired power generators may be forced to offer in a derated amount of their capacity. For example, a 500-MW generator that expects to run at an annual capacity factor of 75% could offer 330 MW of its 500 MW of available capacity into the capacity market. If the 330 MW clears and is called upon throughout the year as expected,

¹⁰³ “Regulatory Impact Analysis for the Proposed 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.” U.S. Environmental Protection Agency. Available at: https://www.epa.gov/system/files/documents/2023-05/utilities_ria_proposal_2023-05.pdf at 3-13.

¹⁰⁴ “PJM State of the Market 2022: Section 5.” PJM. Available at: https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2022/2022-som-pjm-sec5.pdf at 299.

the annual capacity factor of the 500-MW facility would remain below 50% as long as the remaining 170 MW also does not participate in the energy market.

While this approach might serve to achieve compliance with EPA's proposed rule, it would deprive the power generator of critical revenue from the sale of energy and capacity into PJM's wholesale market and negatively impact the plant's economics, potentially leading to early retirement. Similar rules exist in other organized markets.

Further, a power generator in an organized market that has not pursued the CCS pathway or the hydrogen pathway because it expects to operate at an annual capacity factor of less than 50% may offer into the capacity auction normally but end up being dispatched by the grid operator more frequently than expected. The increased dispatch could be the result of unforeseen circumstances that are out of the generator's control, including but not limited to unexpectedly low wind generation, unexpectedly high electricity demand, incremental coal plant retirements or the sudden and sustained loss of a nuclear plant. In all these cases, the power generator was likely critical to maintaining grid reliability but would also be out of compliance with EPA's proposed rule. This risk is difficult to manage, especially for merchant power generators that are at the mercy of sometimes volatile wholesale markets.

F. Applicability Thresholds

EPA has proposed to apply the emission guidelines for existing gas-fired combustion turbines to units that have a capacity greater than 300 MW and that operate at annual capacity factors above 50%.¹⁰⁵ These facilities represent the largest and most frequently operated gas-fired combustion turbines and, given their size, are best positioned to be able to economically invest in CCS and hydrogen blending. Power generators that are smaller and operate less frequently produce less generation over which to spread the significant fixed costs associated with CCS retrofits and hydrogen blending, weakening the economic case for those investments. From an operational standpoint, CCS is more effective for larger power generators that run more frequently, and the 300 MW threshold is also consistent with 40 CFR part 60, subpart UUUUb. Accordingly, API believes that the 300 MW capacity threshold and the 50% annual capacity factor threshold are

¹⁰⁵ 88 FR 33245

appropriate and urges EPA to maintain those levels and to make the applicability threshold consistent with other New Source Performance Standards (NSPS) Subparts in the proposal.

G. Recommendations

Given the critical role that gas-fired power generators will continue to play in maintaining grid reliability amid the energy transition, API urges EPA to follow precedent by coordinating with FERC, NERC, utilities and grid operators to adequately assess the potential impact of the proposed rule on the operations of the bulk power system. API also urges EPA to recognize that matters outside of power generators' control may prevent them from complying with the proposal via the hydrogen pathway or CCS pathway.

To maximize compliance options for power generators, API urges EPA to maintain a technology neutral approach that allows for the use of a combination of hydrogen and CCS technologies to meet emission standards. API also recommends that EPA explicitly allow for the trading of allowances, averaging across generating fleets and other mechanisms that provide flexibility and promote grid reliability.

VII. Exclusions for Industrial Generators

API supports EPA's determination that industrial cogeneration facilities do not need further abatement and therefore should be excluded from this rule. Cogeneration facilities have been exempted since the 2015 NSPS Subpart TTTT was finalized.

EPA's previous exemptions were based on size of generating capacity, amount of electricity provided to grid, or source of heat input. EPA correctly recognized in the 2015 NSPS Subpart TTTT that these types of industrial cogeneration facilities are not power generators in the traditional sense. Moreover, EPA stated in its current proposed rule that "Reducing the output or not developing industrial electric generating projects where the majority of the heat input is derived from the industrial process itself would not necessarily result in reductions in GHG emissions from the industrial facility. However, the electricity that would have been produced from the industrial project could still be needed. Therefore, projects of this type provide significant environmental benefit with little if any additional emissions. Including these types of projects would result in regulatory burden without any associated environmental benefit and could discourage project development, leading to potential overall increases in GHG emissions."¹⁰⁶

For those reasons, API believes these facilities should be excluded from this rule. However, if EPA chooses not to explicitly exclude these facilities, it should at a minimum conduct a separate rulemaking and consider designating CHP as BSER.

¹⁰⁶ 88 FR 33280-33281

VIII. Conclusion

API appreciates the opportunity to provide input in this docket. As noted above, API stands ready to work with policymakers to ensure the robust development of the CCS and hydrogen markets.

Signed,

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