WESTERN ENERGY ALLIANCE

via www.regulations.gov

August 8, 2023

Honorable Michael Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20004

RE: 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 Docket ID No. EPA–HQ–OAR–2023–0072

Dear Administrator Regan:

Western Energy Alliance is struck by the magnitude of the five proposed rules for electric generating units (EGU) and the breathtaking assumption of power as EPA seeks to transform fundamentally the power sector. Despite the ruling in *West Virginia v. EPA* and the Supreme Court's previous halt to the Obama-era Clean Power Plan, EPA is moving forward with a rule meant not to control emissions from the power sector, but rather to determine how the country generates electricity and the mix of sources. In doing so, EPA ignores essential issues of grid reliability and energy affordability for all. The assumption of power and authority over the daily lives of all Americans continues in this and other rules in the name of climate change, yet EPA attempts to reduce the use of natural gas, which has provided more greenhouse gas (GHG) reductions than EPA's preferred wind and solar energy since 2005. The rule is unscientific, illogical, and technically infeasible.

Western Energy Alliance is the leader and champion for independent oil and natural gas companies in the West. Working with a vibrant membership base for over 50 years, the Alliance stands as a credible leader, advocate, and champion of industry. Our expert staff, active committees, and committed board members form a collaborative and welcoming community of professionals dedicated to abundant, affordable energy and a high quality of life for all. The majority of independent producers are small businesses, with an average of fourteen employees.

As representatives of the natural gas producer community, we appreciate that EPA recognizes natural gas electricity generation as a major component of the Best System of Emission Reduction (BSER) for all three load subcategories, serving as the base "highly efficient generation" component. However we question the aggressive targets for Carbon Capture and Storage (CCS) and co-firing low-GHG hydrogen in the timeframes EPA envisions, as well as object to EPA's attempt to retire baseload coal generation prematurely. If EPA has any hope of coming close to achieving its hydrogen co-firing targets, it should include hydrogen derived from natural gas in the BSER.

I. Lack of Authority to Determine the Electricity Mix

In the Clean Air Act (CAA), Congress did not give EPA authority to determine the energy mix of the nation and broadly set energy policy. With this rule, EPA is running afoul of the Supreme Court's ruling in *West Virginia v. EPA.* Congress nowhere provided authorization for EPA to mandate a shift from baseload coal and natural gas electricity generation to unreliable wind and solar generation, experimental hydrogen generation, and prohibitively expensive and essentially nonexistent battery storage. The alternatives that EPA is attempting to achieve via the regulatory process are not at a technological state that they are able to replace natural gas electricity generation—certainly not within the timeframes EPA mandates in the proposed rules, if ever. The rule envisions a world that is impractical and harmful to all Americans as provision of electricity would become unreliable and unstable.

Of course the burning of oil, natural gas, and coal produces greenhouse gas emissions, but would humanity be better off without them? Without an alternative that does everything they do 24/7, a modern, healthy, secure and yes, environmentally protective mode of existence is not possible. Oil and natural gas not only heat homes, provide mobility, and power all facets of the economy, but put food on the table, medicine in the cabinet, and deliver clean drinking water to the tap. Without the energy and products we provide, modern life is not possible. Providing more oil and natural gas to the world will bring those benefits to the billion people without sufficient energy and help lift them out of poverty.

Oil and natural gas also provide a net benefit to the environment. Countries with greater access to reliable, affordable energy not only have higher standards of living, but also cleaner environments and healthier populations. Increased use of natural gas electricity generation leads to lower levels of air pollution and offers a tangible solution for climate change. Fuel switching to natural gas in the electricity sector is the number one reason the United States has reduced more greenhouse gas emissions than any other country since 2005.[1] Intermittent wind and solar energy are not possible without backup, with natural gas electricity being the best option. EPA should recognize that the balance of benefits from natural gas heavily outweigh the impacts.

EPA should not overlook the increasing wealth, health, and safety achieved by countries like the United States that have abundant access to fossil fuels. The past 80 years have been marked by unprecedented improvements in life expectancy, prosperity, food security, infant mortality, and many other health and welfare factors. Deaths from malaria, the most consequential climate-sensitive disease, declined by 52% from 2000 to 2015 with the aide of petroleum-based pharmaceuticals. In the developing world where a billion people lack access to electricity, reliable power is needed to lift them out of poverty. Only natural gas, coal, nuclear, and hydropower reliably provide 24/7 power, yet all are opposed by the climate change activists that cheer these and other rules aimed to eliminate their use.

Throughout the preamble, EPA is making claims about the state of technology that are aspirational, not actual. CAA Section 111 does not give EPA the authority to compel advances in technology that are

[1] *Inventory of US Greenhouse Gas Emissions and Sinks,* Environmental Protection Agency (EPA), April 2020, p. ES-4; *Global CO2 Emissions in 2019,* IEA, Paris, February 2020; U.S. Energy-Related Carbon Dioxide Emissions, 2019, U.S. Energy Information Administration (EIA), September 2020.

unproven on the scale necessary to achieve the net-zero aspirations of the rule. EPA ignores the fundamental problems of grid reliability and energy insecurity that these rules would bring about.

Further, EPA seeks to disadvantage natural gas electricity generation through the rules, but arbitrarily fails to consider that it has done more to reduce GHG emissions than wind and solar generation combined. Fuel switching from coal to natural gas in the electricity sector has delivered 61% of the reductions the Energy Information Administration (EIA) identifies, removing 4,404 million metric tons of carbon dioxide (MMT) since 2005, whereas wind, solar, and other non-carbon energy sources (excluding nuclear) have reduced GHG emissions by 2,798 MMT or 39%.[2] Intermittent wind and solar energy are not possible without backup, with natural gas electricity being the best backup source. EPA should recognize the balance of benefits from natural gas and the role it plays in significantly reducing the nation's GHG emissions. These savings are not theoretical, as are the purported reductions EPA claims from hydrogen co-firing and CCS.

Further, EPA is not considering the full non-air quality environmental impacts of the proposed rules as it seeks to force a transition to wind and solar electricity generation. Nowhere does EPA consider the land use impacts of wind and solar. As intermittent, low-density sources of energy, the land requirements are huge. A Princeton University study estimates that net-zero scenarios, low to high, for wind and solar energy would result in land impacts between 62 million and 247 million acres.[3] Those are equivalent to the surface of Illinois and Indiana combined on the low side and Arkansas, Iowa, Kansas, Missouri, Nebraska, and Oklahoma on the high side. It is unrealistic to expect that Americans and their elected officials would countenance that much land impact.

EPA has not adequately considered the full costs to society of its rule by holistically analyzing total impacts. The same Princeton study estimated that a transmission system to achieve net-zero carbon emissions would cost $2.4 trillion by 2050. High-voltage transmission lines would have to increase 60% by 2030 and triple through 2050.[4] Given how difficult it is to permit transmission lines and other infrastructure, it is impossible to see how the transmission and other infrastructure necessary for the proposed rules have any chance of being built in time to meet EPA's 2032 and 2038 BSER targets. EPA also fails to consider the impact on grid reliability from this and other rules it is promulgating, such as tailpipe emissions rules, which would increase demand for electricity.

EPA claims that the proposed rules would cost only $960 million annually through 2042, while generating $6.9 billion in annualized climate and public health benefits. The Princeton Study belies the low annual cost estimation. We refer to the Chamber of Commerce's detailed analysis of EPA's Regulatory Impact Analysis which identifies major problems with EPA's methodology.[5]

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[2] *U.S. Energy-Related Carbon Dioxide Emissions, 2021*, EIA, December 2022.
[3] *Net Zero Impact: Potential Pathways, Infrastructure, and Impacts*, Final Report Summary, Princeton University, October 29, 2021, p. 55.
[4] *Id*.
[5] *A Closer Look at EPA's Powerplant Rule*, Heath Knakmuhs and Dan Byers, U.S. Chamber of Commerce, Global Energy Institute, June 2023.

II. Technical Feasibility

EPA claims that: "Consistent with the statutory command of section 111 of the CAA the proposed NSPS and emission guidelines reflect the application of the BSER that, taking into account costs, energy requirements, and other statutory factors, is adequately demonstrated." EPA also claims that with the NSPS for GHG emissions in the proposed rules, "…based on highly efficient generating practices, on highly efficient generating practices, hydrogen co-firing, and CCS", the BSER in the proposed rules, "…tak[e] into account the cost of the reductions, non-air quality health and environmental impacts, and energy requirements." (p. 33243) We do not find any convincing evidence in the proposed rules that these statements are anything other than assertions.

For several reasons, we believe EPA has failed in the most basic task of ensuring its BSER is technically feasible or "adequately demonstrated." Even were we to agree that section 111 enables EPA to, "…determine a control to be ''adequately demonstrated' even if it is new and not yet in widespread commercial use", EPA has failed to "…reasonably project the development of a control system at a future time and establish requirements that take effect at that time." EPA has not provided convincing evidence that its projections are reasonable at all, but especially in the aggressive timelines presented in the proposed rules. EPA places too much reliance on unproven, unscalable technology; the ability of that technology to be integrated into the grid on a system-wide basis; the efficacy of government spending; and the ability of government policies to enact a perfected future as intended by today's politicians.

While there are very promising advances taking place with hydrogen energy and CCS, they are both nowhere near ready to be considered BSER and enforceable through a CAA regulation. Both should be considered experimental with respect to their ability to substitute for the base and intermediate load electricity generation that coal and natural gas provide. In no conceivable scenario, given the economic and technical hurdles that must be overcome, can the deployment of hydrogen co-firing and CCS meet the timelines proposed in these rules. EPA runs afoul of *Essex Chemical Corp. v. Ruckelshaus* in that technology considered "purely theoretical or experimental" cannot be considered adequately demonstrated.

EPA's analysis of technical feasibility is too limited, as we demonstrate below. With EPA's grand plans to reorient the electricity sector, the analysis of feasibility must be much broader than the current state of both technologies, for the reasons we articulate below. The proposed rules are arbitrary and capricious because EPA relies on incomplete facts, biased studies, and mistaken assumptions in an attempt to restructure the entire power sector.

It is wholly infeasible for EPA to assume that affected EGU facilities can achieve 90% capture of GHG emissions by 2035 or 30% co-firing with low-GHG hydrogen by 2032 ramping up to 96% by 2038. EPA seeks comment specifically on the percentages and dates, a fundamental question that should have been answered well before proposing rules, such as with a request for information, not in a proposed rule with standards that "would apply immediately upon the effective date of the final rule." (p. 33244)

A. Hydrogen

The hydrogen component of EPA's BSER is based on the assumption that, "…hydrogen produced through low-emitting manufacturing will increase significantly and the cost of which is expected to decline significantly in the near future." (p. 33252) Yet it is highly questionable whether that is a true statement. Other than aspirations that government hydrogen incentive programs in the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA) will work as intended, EPA provides no supporting evidence.

Hydrogen Co-Firing EGU Capacity: EPA states in the proposed rules that, "Many models of new utility combustion turbines have demonstrated the ability to co-fire up to 30 percent hydrogen and developers are working toward models that will be ready to combust 100 percent hydrogen by 2030." (p. 33255) However, plans are not necessarily reality. Projects timelines slip, what was thought feasible can prove elusive, and technologies don't always deliver. Even if some projects do come to fruition, that does not mean that there will be enough installed capacity economy-wide to reach the amount EPA dictates. EPA even admits that several utilities are only co-firing in test burns and that higher levels of co-firing may be more feasible in the 2035 – 2045 timeframe. From the information provided in the proposed rules, it is hard to draw any conclusion other than that EPA's assertion that hydrogen co-firing is adequately demonstrated is arbitrary and capricious.

In fact, the projects that EPA cites as showing the viability of hydrogen co-firing are nowhere near at the scale necessary to achieve either 30% by 2032 or 96% by 2038. If anything, the small scale of these projects indicates that EPA's timelines and percentages are completely unrealistic. The projects EPA identifies in the proposed rules lead more rationally to the conclusion that hydrogen co-firing is far too immature to serve as BSER, especially before 2045. We have summarized those projects in Table 1 to clearly demonstrate how thin the gruel is.

According to EIA, the United States has about 1,160,169 megawatts (MW) of total utility-scale electricity-generation capacity as of the end of 2022.[6] From the information EPA has provided, today's hydrogen co-firing capacity amounts to 24.25 MW, or .002% of U.S. capacity. Even though most of the information EPA provides that we display in our Table 1 below is aspirational, assuming the plans EPA cites come to reality, a very big assumption given the lack of specificity from the "expected" and the "foreseen", by 2025 that equals 276.25 MW or 0.02% of U.S. capacity and by 2045, that rises to 1,210 MW, or 0.1% of today's capacity. There are no firm commitments of capacity by the years EPA dictates in the proposed, i.e., 2032 and 2038. Of course, electricity demand and capacity will increase economy-wide over the timeframes in the chart above, so the percentages we calculated are actually overestimations. It is hard to draw any conclusion other than EPA's proposed rules setting hydrogen co-firing as a major component of BSER is anything other than arbitrary and capricious.

[6] *Electricity generation, capacity, and sales in the United States*, EIA, June 30, 2023.

Table 1. Actual and Planned Hydrogen Co-Firing Projects

Plant	Capacity	Timeframe	Percent Hydrogen Co-Firing
Los Angeles Department of Water and Power (LADWP)	346 MW	2029	None given
		2035-2045	"foresees" 100%
Intermountain Power Agency project (IPA)	840 MW	2025	30% "expected"
		2045	100% "expected"
NextEra Energy	16 GW	2045	None given, just a "carbon free" claim
Duke Energy	None given	After 2030	"All natural gas units build after 2030 are assumed to be convertible to full hydrogen capability"
Cricket Valley Energy Center (CVEC)	None given	No dates	New York will require a zero- emission electricity sector by 2040.
The Long Ridge Energy Terminal	485 MW	2023	5%
		No date given	"has the capability to transition to 100 percent hydrogen over time as its low-GHG fuel supply becomes available"
Constellation Energy	8.6 GW		"exploring electrolytic hydrogen co-firing across its fleet" of 23 natural gas plants.

Availability of Low-GHG Hydrogen and Infrastructure: Likewise, EPA's evidence of the feasibility of hydrogen supply is unconvincing. The Biden Administration's aggressive plans to decommission coal and replace it with wind and solar power generation have already raised questions of adequate capacity to meet projected levels of demand even before other government plans such as EPA's tailpipe emissions rules that would compel high levels of electric vehicle (EV) market penetration, and other IRA and IIJA targets may or may not come to fruition. It is hard to understand how there would be sufficient wind and solar capacity to also produce low-GHG hydrogen according to its definition in the proposed rules. EPA would be wise to expand the definition of "low-GHG hydrogen" to include hydrogen produced from natural gas, since natural gas provides 95% of commercial hydrogen today.

Indeed, in the proposed rules EPA acknowledges that, "Only small-scale facilities are currently producing hydrogen through electrolysis with renewable or nuclear energy…" (p. 33312) The proposed rules run afoul of the D.C. Circuit Court's definition of "adequately demonstrated" which includes the provision that EPA, "…may make a projection based on existing technology, that that projection is subject to the restraints of reasonableness and cannot be based on 'crystal ball' inquiry." (as quoted on p. 33272) EPA cites as evidence for the availability of low-GHG hydrogen funding under IIJA and IRA. But hydrogen RD&D grants do not equate to hydrogen delivered. To actually meet the hydrogen co-firing goals of the proposed rules, EPA should expand the definition of low-GHG hydrogen to include that derived from natural gas.

EPA does not provide data showing availability of sufficient quantities of low-GHG hydrogen as it is defined in the proposed rules. Today, over 95% of hydrogen originates from natural gas using steam-methane reforming (SMR). As EPA states in the preamble, the Department of Energy (DOE) and the

National Energy Technology Laboratory (NETL) "anticipate" and "expect" low-GHG hydrogen will become more available as incentives from IRA and IIJA bear fruit. EPA appropriately recognizes that the low-GHG hydrogen definition under IRA aimed at incentivizing RD&D is different from a BSER standard under the CAA, yet nevertheless persists with a standard that is simply not feasible given the state of the technology and the cost. BSER must be technically feasible and adequately demonstrated, not aspirational as is an RD&D incentive under a government grant program. EPA should consider natural gas as a low-GHG fuel for purposes of BSER under the proposed rules for at least a substantial phase-in period such as through 2040. Doing would help ensure the proposed rules meet the D.C. Circuit's test that the BSER does not, "…becom[e] exorbitantly costly in an economic or environmental way."

Further, currently so-called low-GHG hydrogen takes more electricity to generate than it produces. Hydrogen advocate Chris Goodall estimates, using a survey of the major manufacturers, that it takes about 50 kWh for an electrolyzer to produce a kilogram of hydrogen, which itself has an energy value of 33.3 kWh, a 67% efficiency.[7] Goodall anticipates efficiency will rise to 75% within three years, but even so, it takes more electricity to produce hydrogen than the hydrogen itself generates. That fact alone renders the BSER hydrogen co-firing BSER as experimental, not adequately demonstrated.

Likewise, DOE recognizes that the cost of hydrogen generation is too high. The Energy Earthshot program was formed in 2021 to reduce the cost of clean hydrogen to $1 per 1 kilogram in 1 decade. Meanwhile, the IRC 45V tax credits are as high as $3 per kilogram. Just because the taxpayer is picking up the RD&D costs for companies to produce low-GHG hydrogen does not mean the cost goes away. The fact that such a high tax credit is necessary further argues that hydrogen co-firing is not a feasible BSER at this time and certainly not within the timeframes EPA has laid out in these proposed rules.

Crucial manufacturing capacity and supply chain issues would occur in order to retrofit natural gas power plants for hydrogen co-firing within the timeframes in the proposed rules. There are serious questions of supply chain capacity for necessary pipelines, retrofitted units, low-GHG hydrogen, and other infrastructure necessary to meet the proposed rule requirements. EPA has not considered the increase in demand of the required steel that would be necessary for equipment retrofits and the additional pipelines that would be needed.

Currently the approximately 1,600 miles of dedicated hydrogen pipeline are woefully inadequate to meet the amount of hydrogen co-firing envisioned in the proposed rules, whereas there are over 3 million miles of natural gas pipelines. The build-out of the necessary pipeline infrastructure would be a huge drain on the U.S. steel supply, even assuming the pipeline infrastructure required could be permitted in the rules' timeframes. Strain on the steel supply chain would be further hampered by the retirement of coal power plants forced by these proposed rules, since most of the steel mills in the United States are powered by coal. EPA has not adequately analyzed how these rules put in jeopardy the steel supply required by these rules.

EPA blithely mentions that natural gas pipelines can be used, yet hydrogen is a smaller molecule than methane and is susceptible to leakage when used in natural gas piping and fittings. Hydrogen is highly

[7] *Some rules of thumb of the hydrogen economy*, Chris Goodall, June 11, 2021.

reactive compared to natural gas with a higher flame velocity. Mixing it in pipelines and in power plants raises safety concerns that have not been adequately considered. We are struck by the magnitude of the challenges to overcome to force a quick transition to hydrogen at this stage of its development.

Finally, EPA has failed to fully support its determination of hydrogen co-firing as BSER in accordance with section 111 because it has not adequately considered the non-air quality environmental impacts of hydrogen's water use. EPA has not analyzed sufficiently the water use of electrolytic hydrogen production. Besides producing less electricity output than the input, electrolyzers require huge quantities of water, perhaps as much as nine tones of water to produce one ton of hydrogen. But those nine tones of water must be purified. Water treatment systems typically require two tons of impure water to produce one ton of purified water, meaning that hydrogen produced from an electrolyzer takes not just nine but 18 tons of water. The purification process itself takes large amounts of electricity.[8] EPA has not adequately analyzed the environmental impacts.

In summary, hydrogen co-firing is not technically feasible. As such, it is too premature for EPA to consider it BSER under section 111. Should EPA persist, EPA should desist with a definition of low-GHG hydrogen that prevents the use of natural gas-derived hydrogen.

B. Carbon Capture and Sequestration

As with hydrogen co-firing, the CCS component of BSER is unrealistic, speculative, and experimental. The projects EPA cites as showing the "demonstration" of CCS are nowhere near at the scale necessary to achieve the proposed rules requirement of 90% CCS by 2035. In fact, there is only one operating commercial CCS plant in the world and none in the United States.[9] That alone demonstrates that the technology is experimental and not adequately demonstrated as required to be considered BSER.

We do not need to calculate the percentages of electricity capacity for Table 2 as we did with Table 1, as none are operational and meeting any electricity demand in the United States. The information EPA provides proves that CCS is still in the experimental stage and in no way ready to be designated as BSER under the CAA. The CCS requirement in the proposed rules would be arbitrary and capricious should it be finalized. We do not include the projects EPA lists on page 33293 since those are just grant awards, not built and demonstrated. The existence of grants does not necessarily equate ultimately to energy delivered.

[8] "Green hydrogen – nobody seems to want to talk about water", Irina Slav, *Energy in Demand,* March 13, 2021.
[9] "Only still-operating carbon capture project battled technical issues in 2021," *S&P Global Marketplace,* January 6, 2022.

Table 2. Actual and Planned CCS Projects

Plant	Capacity	Timeframe	Percent CCS
SaskPower Boundary Dam Unit (Saskatchewan)	110 MW	2014 - Present	Although EPA claims 90% demonstrated, the plant has not consistently met the target.
AES Warrior Run (MD)	180 MW	Unclear past 2009	10% demonstrated to provide food industry with CO_2, but EPA only provides info through 2009
Shady Point (OK)	320 MW	2001 - 2019	5%, no longer operational
Bellingham Energy Center (MA)	40 MW	1991 – 2005	85-95% for use in the food industry
Peterhead Power Station (Scotland)	900 MW	End of 2020s	Potential for 90%, if planned storage site can serve as the sequestration destination
Competitive Power Ventures (WV)	1,800 MW	End of 2020s	No capture percentage given
Petra Nova (TX)	240 MW	Shutdown 2021	92.4% demonstrated
Plant Barry (AL)	25 MW	2011	90% demonstrated
La Porte, TX Test Facility	50 MW	2021	No capture percentage given
Broadwing Clean Energy Complex (IL)	280 MW	None given	No capture percentage given

Availability of CCS Infrastructure: Crucial questions exist about the ability of the supply chain to support the rapid transitioning of power plants to CCS envisioned by the proposed rules. Currently the approximately 5,339 miles of dedicated CO_2 pipeline are woefully inadequate to meet the levels of CCS envisioned in the proposed rules. EPA cites to plans for 3,300 more miles of CO_2 pipelines, but does not provide information that these additions are anywhere near enough to meet the requirements of the proposed rules. Nor does EPA provide projections of how much more pipeline capacity would need to be built to comply with the rules. EPA does not analyze the impact on the U.S. steel supply, even assuming that pipeline infrastructure could be permitted. Strain on the steel supply chain would be further hampered by the retirement of coal power plants forced by these proposed rules, since most of the steel mills in the United States are powered by coal.

EPA has not demonstrated that sufficient infrastructure exists for sequestration either. The proposed rules do not provide projections of how much CO_2 would need to be captured in order to meet the requirements of the rules, nor if existing or planned capacity are adequate to meet those needs or if they are economic to develop. Without that detailed analysis, we do not understand how EPA can assert on page 33298 that CCS costs are reasonable. The 115% increase of capital costs on a dollar per kilowatt basis and the 35% increase in operating costs that EPA identifies on page 33298 do not sound reasonable to us, especially since that cost is accompanied by a decrease of output by 11% for new combined cycle EGUs. Nor does the levelized cost of electricity (LCOE) increase of 61% for a base load combustion turbine. We further question EPA's assessment of "reasonable", give that, per footnote 340, the cost assessment is based on a 7% interest rate, a rate which EPA purposefully ignores when calculating the Social Cost of Greenhouse Gases in other rulemaking efforts, and given that the cost increases identified do not include costs for CO_2 transport, storage, and monitoring. Further, the cost assessment is at a 65% capture rate, not the 90% required by the proposed rules. Without the full cost assessment, the proposed rules are arbitrary and capricious.

We also question the ability of EPA to approve the Class VI wells necessary for these rules, as EPA struggles currently to approve injection well permits. Grants awarded for the projects identified on page 33293 are not accompanied by permits approved. The inability of the federal government to approve pipelines and overcome litigation is obvious, given such examples as the Mountain Valley Pipeline and the Dakota Access Pipeline, but it is doubtful that the EGUs themselves can be permitted efficiently to meet EPA's aggressive timelines.

In summary, CCS is not technically feasible within the timeframes of the proposed rules and is too premature for EPA to consider it BSER under section 111.

C. Grid Reliability

EPA has failed to adequately consider the impact of the proposed rules on grid reliability, especially in conjunction with other proposed rules such as the tailpipe emissions standards for light-, medium-, and heavy-duty vehicles. The electric grid is in no way capable of handling the huge increase in intermittent renewable electricity that these rules would require. The proposed rules expose the country to severe grid instability and increase the chances for electricity blackouts and brownouts.

EPA should analyze grid reliability in this rulemaking and reference the large body of work raising concerns about intermittent renewable generation without sufficient reliable baseload electricity generation from natural gas and coal will destabilize the grid.[10] Without sufficient grid capacity and the critical mineral supply necessary to support a high percentage of wind and solar energy and battery storage, the proposed rules are technical infeasible and logically flawed.

EPA itself provides evidence in the preamble of the negative impact of the proposed rules on grid reliability by mentioning the fact that battery storage has demonstrated the ability to integrate renewable energy into the grid. EPA notes that the best available information from EIA shows there are 331 large-scale battery storage systems operating the in the United State with a combined capacity of 4.8 GW and 30 GW anticipated by 2025. With total U.S. electricity demand at 1,160 GW, that represents just 4% of demand. Later EPA mentions projections of 97 GW of storage by 2035 and 152 GW by 2050 (p. 33265). Again though, those projections represent just 8% and 13% of today's total capacity, much less the larger capacity that will be needed in those years, which is insufficient to ensure grid reliability.

EPA must reconsider its analysis on technical feasibility by considering a full range of data on grid reliability and how other rules EPA and the Biden Administration at large are advancing will together destabilize the grid. Many are warning of the lack of infrastructure to support the administration's net-

[10] For example see *Electric Vehicle Dynamic Charging Performance Characteristics during Bulk Power System Disturbances*, North American Electric Grid Reliability Corp. et al., April 2023; Testimony of Federal Energy Regulatory Commissioners Willie Phillips, Mark Christie, and James Danly before the Senate Energy & Natural Resources Committee, May 4, 2023, warning: "We face unprecedented challenges to the reliability of our nation's electric system."…the U.S. electric grid is "heading for a very catastrophic situation in terms of reliability…" and there is a "looming reliability crisis in our electricity markets."

zero and climate change goals. The nation would need to spend $20 billion to $30 billion annually on new transmission lines for the increased demand, but is spending next to nothing.[11]

III. Unrealistic Policy Assumptions

Throughout the preamble, EPA cites to legislation, especially IRA and IIJA, as justification for determining CCS and hydrogen co-firing are adequately demonstrated. The implication is that since the government has allocated billions of dollars of funding for CSS and hydrogen, then it is economic and technically feasible. However, if anything, the need for government funding for RD&D indicates that the two technologies are experimental. In addition, the existence of government funding does not mean that the intended goals will be achieved. IRA and IIJA are about incentivizing these new technologies in the hope that doing so will make them feasible at some point in the future. The very fact that IIJA discusses CCS and hydrogen co-firing as demonstration projects and pilot projects attests to the fact that it is far too premature for EPA to take the next step and require these technologies as BSER under Section 111 of the CAA.

EPA's assumptions on the ability to achieve the levels of CCS and hydrogen co-firing envisioned by the proposed rules are aspirational, not actual. Rather than basing its analysis on the technical feasibility, EPA cites intentions, announcements, and aspirations to achieve the proposed BSER, citing those aspirations as if they are reality. Further, EPA assumes that the policies enacted through IRA and IIJL will work exactly as planned, as if government policies can be assumed to work efficiently exactly as intended, while ignoring the fact that federal government spending is regularly subject to waste, fraud, abuse, and cronyism. Solyndra stands as the poster child for how well federal government investment in renewable energy works, yet the renewable subsidies doled out during the Obama Administration pale in comparison to the spending envisioned in IRA and IIJL, inevitably leading to future Solyndra-like debacles.[12] Indeed, the news is littered with examples of government-directed projects that failed to meet their energy and job-creation goals. We list several examples in this footnote number 13.[13]

EPA's analysis of technical feasibility, based too heavily on the ability of government spending to achieve the levels of CCS and hydrogen co-firing required by the proposed rules renders the rules arbitrary and capricious. Immature technologies with such low market penetration should be considered experimental until such time as they are implemented in a substantial commercial operational capacity with significant quantities of electricity delivered to consumers. EPA itself provides evidence in the

[11] Rob Gramlich, founder and president of Grid Strategies, a transmission policy group, as quoted in "Why the electric vehicle boom could put a major strain on the U.S. power grid," *CNBC,* July 1, 2023.
[12] "From Bad to Worse: U.S. Taxpayers Keep Losing Money on Solyndra," Institute for Energy Research, October 25, 2012; "'Connected' Energy Firm Got Lowest Interest Rate on Government Loan," Ronnie Green and Matthew Mosk, *ABC News,* September 6, 2011.
[13] "Before Solyndra, a long history of failed government energy projects", Steven Mufson, *The Washington Post,* November 12, 2011; "Obama green-tech program that backed Solyndra struggles to create jobs", Carol Leonnig and Steven Mufson, *The Washington Post,* September 14, 2011, reporting that, "A $38.6 billion loan guarantee program that the Obama administration promised would create or save 65,000 jobs has created just… 3,545 new, permanent jobs after giving out almost half the allocated amount, according to Energy Department tallies."; "Energy Subsidies," Chris Edwards, *Downsizing the Federal Government*, December 14, 2016; "President Obama's Taxpayer-Backed Green Energy Failures," Ashe Schow, October 18, 2012.

preamble for how intentions, projections, hopeful studies, and plans do not always come to fruition. EPA cites the feasibility study for SaskPower's Shand Power Station that projects achievable capture rates of 97% in footnote 245, yet that power station is not on line.

Further, government policy that wishes to expand capacity of CCS and hydrogen co-firing is unlikely to achieve its intended goal, given the track record of the country over the past several decades in permitting, long processing times for National Environmental Policy Act (NEPA) analysis, and other environmental laws that will continue to slow new projects. The very actions of this administration to constrain domestic supplies of the critical minerals necessary for wind, solar and battery storage, such as EPA denying the water permit for the Pebble Mine in Alaska and the Interior Secretary withdrawing 225,594 acres in Cook, Lake, and Saint Louis counties of Minnesota from mineral leasing, belie EPA's assumptions on domestic supply. The ability to replicate anywhere near an equivalent amount of critical minerals by the years 2032, 2035, and 2038 is unrealistic and would cause the United States to become dependent on foreign mineral supplies, mostly from China and Africa. The fact that the president and Congress wish to support domestic supply chains for critical minerals does not mean it will be so.

Likewise, EPA cites (p. 33262) to public announcements by utilities to voluntarily cease operating coal-fired generation and move toward zero- and low-GHG energy generation. Given the regulatory pressures on coal power plants and the political pressure from this administration, we question how "voluntary" these commitments really are. Nevertheless, public announcements about CO_2 emission reductions by large companies facing investor ESG pressure and political pressure are just that, announcements, not reality. As with countries announcing Paris or Kyoto climate change targets that they can never quite meet, company announcements are not reality.

We appreciate the opportunity to comment but strongly urge EPA to desist with these proposed rules as exceeding its authority based on arbitrary and capricious legal and technical justification. At a minimum, we urge EPA to keep this comment period open longer because of the complexity of the five rules and the public's need to better understand the impacts on the electricity sector and the entire economy. Thank you.

Sincerely,

Kathleen M. Sgamma
President