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U.S. Environmental Protection Agency
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1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Subject: Comments on the U.S. Environmental Protection Agency's Proposed Amendments to the Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (82 Fed. Reg. 65,424 (Dec. 20, 2018)).

Dear Sir/Madam:

The American Petroleum Institute ("API") provides these comments on the U.S. Environmental Protection Agency's ("EPA's" or "the Agency's") Proposed Amendments to the Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Electric Utility Generating Units ("Proposed NSPS Amendments"). API represents over 600 oil and natural gas companies. These companies are leaders of a technology-driven industry that supplies most of America's energy, supports more than 10.3 million jobs and nearly 8 percent of the United States economy, and, since 2000, has invested more than $3 trillion in U.S. capital projects to advance all forms of energy, including alternatives.

First, to be clear, our comments are focused on this particular proposal and not the general issue of climate change. In his January 2019 State of American Energy address, API Chief Executive Officer Mike Sommers stated that the risks of climate change are real, industrial activity around the globe impacts the climate, and America's natural gas and oil industry is meeting the climate challenge head-on. The United States oil and natural gas industry has invested an estimated $339 billion between 1990 and 2016 toward improving the environmental performance of its products, facilities and operations—$1,045 for every man, woman and child in the United States.[1] From 2000 through 2016, the United States oil and natural gas industry directly invested approximately $108 billion specifically in zero- and low-emissions technologies.[2] Additionally, many API members are involved with projects that will advance carbon capture and sequestration technology, which is discussed further in these comments. Finally, thanks largely to the increased use of natural gas in power generation, carbon dioxide emissions in the United States are at their lowest level in a generation.[3]

API members are potentially impacted by this proposal in many ways. First and foremost, API members produce natural gas. According to the EIA, on an annual basis, natural gas surpassed coal in 2016 as the fuel most used to generate electricity in the United States, and natural gas is projected to remain the leading source of electricity generation through 2050. In 2018, natural gas accounted for 34% of total electricity generation, and EIA projects its share to grow to 40% by 2032 and then remain between 39% and 40% throughout 2050.[4]

Although EPA is not proposing changes to the current NSPS for natural gas-fired electric utility generating units ("EGUs"), API believes it is important to provide these comments to describe the vital role of natural gas in power generation and to ensure that the administrative record reflects that natural gas is reliable, abundant, affordable, and environmentally beneficial. API also wants to ensure that the NSPS recognizes the importance of combined heat and power ("CHP") units and simple cycle combustion turbines. We believe these units should be excluded from the applicability of the NSPS based on their importance to energy efficiency, the expansion of renewable energy, and reliability.

API members are also potentially impacted by this proposal because they use power generated by EGUs subject to the NSPS, as well as by other sources. Petroleum refineries are the nation's second-highest industrial consumer of electricity.[5] Access to clean, reliable, and affordable electricity is vital to providing the nation with critical fuels, petroleum products, and chemicals in a cost-effective manner.

Finally, API members are interested in this proposal in the event that EPA relies upon this framework for a potential future greenhouse gas ("GHG") standard applicable to an entirely distinct sector, such as the refining and petrochemical manufacturing industry. We believe there are a substantial number of differences between the refining/petrochemical manufacturing and power generation industry sectors, including the magnitude of emissions, industry economics, Federal and State incentives, transportation networks, ownership structures, profit margins, customer bases, global competition, and trading issues. Therefore, any potential subsequent regulations will need to consider these differences.

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[1] https://www.api.org/news-policy-and-issues/environment.
[2] https://www.api.org/~/media/Files/News/2018/18-May/2017_API_GHG_Investment_Study.pdf.
[3] DOE/EIA 0035(2019/1).
[4] https://www.eia.gov/todayinenergy/detail.php?id=38252, Feb. 6, 2019.
[5] https://www.eia.gov/energyexplained/?page=us_energy_home.

Indeed, it is API's interest in EPA's adoption of clear, reasonable, and legally sound regulation that has informed our advocacy in this effort, and in all prior efforts to regulate GHG emissions from EGUs. As before, API's comments are premised on our interest in ensuring that EPA adopts regulatory approaches that are clear and consistent with the Agency's governing statutes. API acknowledges that the risks of climate change are real and we are not arguing against all regulation of GHG emissions.

I. SUMMARY OF COMMENTS

Natural gas provides a clean, reliable, and affordable means of producing electricity. Given its abundance and affordability, natural gas is now the primary source of domestic electricity generation, and is expected to remain so for the foreseeable future. The dominant role of natural gas in electricity generation benefits consumers as well as the environment. Domestic industrial electricity prices are 40-60 percent lower than our global rivals. At the same time, natural gas-fired power production has reduced domestic CO_2 emissions to their lowest levels in decades, while providing the on-demand "dispatchable" power necessary to foster the expansion of clean but intermittent renewable power sources.

Natural gas is also a reliable and resilient power source. The physical operations of natural gas production, transmission, and distribution make the system inherently reliable and resilient.

Given these favorable attributes, API supports EPA's proposal to refrain from amending or reopening the "Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units" which EPA promulgated in 2015 ("2015 NSPS") for new and reconstructed natural gas-fired combustion turbines. API supported these standards for combustion turbines in 2015 and continues to do so today because, unlike the 2015 NSPS's standards for coal-fired EGUs, EPA's BSER analysis for combustion turbines appropriately focused on technology that was currently used in commercial operations throughout the United States.

While API continues to support EPA's BSER analysis for natural gas-fired combustion turbines, we believe that the 2015 NSPS utilized an imperfect and potentially problematic method of delineating between "combined cycle" and "simple cycle" combustion turbines. As a result of this imprecise delineation, many simple cycle combustion turbines will likely be subject to the more stringent performance standards for combined cycle combustion turbines—standards that most simple cycle turbines cannot meet. To avoid inadvertently subjecting these important peaking power sources to standards for combined cycle combustion turbines, API recommends that EPA simply exclude all new, modified, and reconstructed simple cycle combustion turbines from NSPS applicability.

Similarly, while API continues to support the Agency's 2015 decision to exclude CHP units from the definition of "affected EGUs," we believe that the metrics for excluding these units is difficult to demonstrate, overly restrictive, and, as a result, will likely cause some CHP units to remain subject to the performance standards. As such, in order to avoid unnecessary regulation of these environmentally beneficial units, API recommends that EPA simply exclude all industrial, commercial, and institutional CHP units from the NSPS.

In additional to our comments about the means by which the 2015 NSPS and Proposed EGU NSPS define and regulate natural gas-fired units, API remains concerned about EPA's overall approach to promulgating these performance standards for EGUs. We continue to believe that the CAA compels EPA to make an endangerment finding that is specific to the source category and the precise pollutant that the Agency seeks to regulate. As such, API recommends that the Agency revisit the process by which EPA determined whether the source category emits carbon dioxide in amounts that represent a "significant contribution" to endangerment of public health and welfare. Doing so can help ensure that these and any future NSPS are premised on solid and defensible legal foundations.

API is also concerned about certain aspects of the analyses underlying the Agency's proposed determinations regarding the "Best System of Emission Reduction" ("BSER"). In particular, while API supports EPA's proposed conclusion that partial carbon capture and storage ("CCS") would not qualify as BSER at newly constructed coal-fired steam generating units, we do not concur with EPA's characterizations of the feasibility of the technology or the availability of suitable sequestration sites.

Management of CO_2 emissions through utilization of CCS in a portfolio of energy technologies is viable in specific circumstances now, and will be further developed and deployed in the futures. API believes that continued growth in CCS investment demonstrate that CCS technology continues to advance and that CCS may be utilized as a viable CO_2 management option for certain projects. Nonetheless, we concur with EPA's analysis in the Proposed NSPS Amendments that these same projects have experienced significant technical difficulties, reliability issues, and cost overruns that would have been detrimental to the projects had they not been receiving financial support from the government.

Finally, while API agrees with EPA that natural gas co-firing is not BSER, we do not agree with some of the rationales that the Agency employed in reaching this determination. For instance, it is inaccurate to suggest that natural gas co-firing diverts natural gas from more efficient NGCC units in order to achieve more modest emission improvements in less efficient coal-fired units. While NGCC units are far more efficient than coal-fired units (even with natural gas co-firing), the implication of scarcity underlying this concern is simply baseless. Natural gas is a reliably abundant source of energy in the United States.

It is similarly inaccurate for EPA to suggest that the need for more natural gas pipeline infrastructure makes natural gas co-firing a compliance option available in only a few select regions. While more natural gas pipeline infrastructure is indeed necessary, it is not credible to suggest that natural gas-based compliance options are anything less than widespread and widely available.

II. DETAILED COMMENTS

A. <u>The Important Role of Natural Gas in Power Generation</u>

America is now the world's leading producer and refiner of oil and natural gas, a reality that was unimaginable just a decade ago. We have transitioned from an era of energy scarcity and dependence to one of energy abundance and security. The United States has been able to take advantage of new technology to safely tap into energy resources that were once thought inaccessible; in fact, current natural gas resources could meet up to 100 years[6] of current demand. Renewable energy is certainly a growing and important part of our economy's energy mix, but natural gas has led the way—and will continue to lead the way—in meeting our growing energy needs. The 2015 NSPS projected that natural gas would produce 31 percent of the United States' electric generation in 2040. While this estimate correctly predicted the growing role of natural gas in power generation, it underestimated the pace by which natural gas use has grown. The United States has already surpassed that 31 percent projection—more than twenty years earlier than EPA estimated in 2015. In fact, natural gas produced 32.1 percent of America's electric power, and generated more electricity than any other fuel source in 2017—surpassing coal by 2.2 percent.[7]

The developments of the past decade have brought cost savings for American consumers, good paying jobs, renewed opportunities for U.S. manufacturing, a stronger economy, and greater national security. According to 2018 data, domestic industrial electricity prices are now 40-60 percent lower than our global rivals.[8] These lower prices help cut energy and material costs for American manufacturers and increase their competitiveness globally.[9] Notably, these rapid increases in production did not come at the expense of environmental protection. In fact, record domestic production and refining is happening alongside greater environmental progress.

Even the growing renewable energy industry relies on natural gas to sustain its progress. Natural gas is capable of providing on-demand "dispatchable" power that can follow any real-time changes in electrical load. Natural gas-fired power generation can also provide the grid stability that is increasingly important with the integration of more intermittent, renewable energy. While solar and wind power are dependent on weather patterns and can be inconsistent, natural gas can be relied upon as an affordable, economically efficient power to stabilize the grid.[10] Clean and abundant natural gas is a key driver of reliability in power generation. With such a clean, reliable, and affordable source of energy, we do not have to sacrifice economic growth for environmental progress.

i. Environmental Benefits of Natural Gas

The environmental benefits of natural gas are undeniable. From 2005 to 2017, the United States increased natural gas consumption for electricity generation by nearly 60 percent, while CO_2 emissions from electricity generation fell by 27.8 percent.[11] Much of these CO_2 reductions are attributable to increased natural gas use because natural gas combustion emits about half as much CO_2 as coal combustion. Combustion of natural gas also results in lower emissions of mercury, particulate matter, nitrogen oxides, and sulfur dioxide.

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[6] https://dailyenergyinsider.com/news/5546-american-petroleum-institute-releases-report-benefits-oil-natural-gas-industry/.
[7] https://www.eia.gov/tools/faqs/faq.php?id=427&t=3 (accessed 10/30/18).
[8] https://www.statista.com/statistics/263492/electricity-prices-in-selected-countries/.
[9] https://www.api.org/oil-and-natural-gas/energy-primers/americas-natural-gas.
[10]http://energytomorrow.org/~/media/Files/Policy/%20SOAE-2017/State-Of-American-Energy-Report-2017-Low.pdf?la=en.
[11] U.S. EIA, *Monthly Energy Review January 2019*. https://www.eia.gov/totalenergy/data/monthly/.

In addition to the environmental benefits associated with the cleaner combustion of natural gas, natural gas is being produced in an increasingly effective and efficient manner. Emissions from natural gas systems have fallen 16.3 percent since 1990, despite a rise in natural gas production of more than 50%.[12] The industry has adopted voluntary practices to reduce maintenance-related releases of the greenhouse gas methane by installing improved controllers and pumps, and expanding monitoring, leak inspection, and data collection programs. The industry also works with universities and nongovernmental organizations to monitor methane emissions and find ways to decrease these emissions. Significantly, this collaboration is in addition to the investment of $108.2 billion between 2000 and 2016 on zero- and low-carbon technologies across all sectors of the oil and natural gas industry and beyond.

ii. Natural Gas is Reliable

The United States has abundant natural gas resources that enable our industry to provide a safe and reliable fuel source for electricity production, transportation, manufacturing, and other uses. In only a few years' time, the United States has become the largest producer of natural gas in the world. Estimates of the gas resource base have more than doubled in the past decade.[13] Since 2010, production has grown over 40%, with government forecasts calling for production to once again reach a record of more than 90.2 billion cubic feet per day this year.[14] This record production reaches natural gas users through a network of pipelines that is extensive, reliable, and expanding every year.

Demand for natural gas in the power sector has increased, driven by natural gas's low-carbon emissions, retirements of older coal-fired plants, the comparatively low cost and small footprint of natural gas-fired power plants, and the on-demand "dispatchable" power on which the expansion of renewable energy industry depends.[15] Because of these advantages, natural gas is poised to become an even more important part of States' energy portfolios as they seek to meet State clean energy objectives.

Yet, with the forecasted growth in power demand, some—particularly those unfamiliar with natural gas operations and contractual practices—question the ability of natural gas to continue to reliably serve this market. These reliability concerns, however, overlook the physical characteristics of natural gas, as well as operational industry practices that provide an extremely high level of reliability and resiliency for gas customers. The physical operations of natural gas production, transmission, and distribution make the system inherently reliable.

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[12] U.S. EIA, *Monthly Energy Review January 2019*. https://www.eia.gov/totalenergy/data/monthly/.
[13] *See* Potential Gas Committee *Biennial Report of Potential Supply of Natural Gas in the United States*, (December 31, 2014), 2015.
[14] See EIA *Short Term Energy Outlook*, February 2019.
[15] See Leidos (formerly SAIC), Comparison of Fuels for Power Generation, 2016, available here.

Disruptions to natural gas service are rare. When they do happen, a disruption of the system does not necessarily result in an interruption of scheduled deliveries of natural gas supply because the natural gas system has many ways of offsetting the impact of disruptions. As noted in a report from MIT:[16]

> The natural gas network has few single points of failure that can lead to a system-wide propagating failure. There are a large number of wells, storage is relatively widespread, the transmission system can continue to operate at high pressure even with the failure of half of the compressors, and the distribution network can run unattended and without power. This is in contrast to the electricity grid, which has, by comparison, few generating points, requires oversight to balance load and demand on a tight timescale, and has a transmission and distribution network that is vulnerable to single point, cascading failures.

Certain inherent characteristics of natural gas contribute to its reliability. Unlike electricity that travels at the speed of light and flows along a path of least resistance, natural gas moves through the transportation system with the use of compressors that pressurize the gas. Natural gas readily moves slowly through pipelines at an average speed of 15-20 miles per hour, and its flow can be controlled. This allows time for pipeline operators to manage the flow of natural gas and to adjust their operations in the unlikely event of a disruption. Because of the pipeline operators' ability to manage natural gas on their transportation systems, a failure at a single point on the system typically results in only a localized effect.[17]

In addition, natural gas is produced in diverse geographic areas spread across many United States and Canada. These abundant natural gas supplies and diverse production areas help ensure that overall natural gas production is rarely impacted by isolated local or regional events. In the United States today, there are nearly a half million wells producing natural gas[18] spread across 30 States and the Gulf of Mexico.[19] There are hundreds of natural gas producers, and even the largest U.S. producer contributes less than 7 percent to total domestic supply.[20] This diversified supply is connected to a pipeline network that is extensive and expanding.

Another valuable characteristic of natural gas is its amenability to storage after production. Natural gas is most commonly stored underground in depleted aquifers and oil and gas fields, as well as in salt caverns. It can also be stored above ground in storage tanks as liquefied natural gas ("LNG") for use at import and export facilities and at peak shaving plants, or as compressed natural gas ("CNG") for industrial and commercial uses. In addition to the importance of storage as a supply

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[16] Massachusetts Institute of Technology, Lincoln Laboratory, "Interdependence of the Electricity Generation System and the Natural Gas System and Implications for Energy Security," May 15, 2013.
[17] More detail about the physical, operational characteristics of the natural industry segments can be found in the Appendices to the 2011 Southwest Cold Weather Event report prepared by the staffs of FERC and NERC. Report on Outages and Curtailments During Southwest Cold Weather Event of February 1-5, 2011 (August 2011), Appendices 8-10 ("Southwest Cold Weather Report").
[18] https://www.eia.gov/dnav/ng/ng_prod_wells_s1_a.htm.
[19] https://www.eia.gov/tools/faqs/faq.php?id=46&t=8.
[20] https://www.ngsa.org/wp-content/uploads/2019/01/Third-Q-2018-production.pdf.

cushion, natural gas storage also provides vital operational flexibility in the event of constraints in the pipeline and distribution network, as storage facilities are widely dispersed on those networks.

A new report, commissioned by API and conducted by the Brattle Group[21], outlines some key reliability challenges and defines several crucial attributes that help maintain and strengthen system reliability. In defining these attributes and scoring their applicability to different fuel types, the report highlights natural gas's unique ability to support grid operations across the board. The tangible reliability benefits offered by flexible power sources—like natural gas—include the following reliability attributes:

- Generation Capability: No attribute is more fundamental to system requirements than the ability to generate electrical energy.
- Dispatchability: Dispatchable resources have the ability to change their output or consumption levels in response to an order by the system operator. While virtually all resources are dispatchable to some degree, some have greater capabilities than others and require shorter lead times.
- Security of Fuel Supply: Security of fuel supply measures the dependability of a resource's energy inputs, or fuel.
- Start Times and Ramp Rates: Closely related to dispatchability, start times and ramp rates determine the speed at which resources can respond to system operators' orders to increase and decrease electricity delivered to the grid.
- Inertia and Frequency Response Capability: Inertia and frequency response are attributes of resources that help the system meet the requirement to maintain frequency stability.
- Reactive Power Capability: The ability to provide reactive power is an attribute necessary for meeting the system's requirement to maintain voltage within certain limits to prevent generator operation malfunctions or, in the worst case, cascading blackouts.
- Minimum Load Level: A resource's minimum load level describes the lowest level of electrical output the resource can continuously send to the grid.
- Black Start Capability: Black start capability is the ability of a power plant to restart without relying on the transmission network to deliver power.
- Storage Capability: Resources with the attribute of storing electricity help the system meet multiple requirements including meeting bulk demand, following load or net load, and maintaining frequency stability, but not all resources with the ability to store electricity contribute to meeting all of the requirements.
- Proximity to Load: The ability to site resources close to load is an attribute that helps the system meet bulk demand and maintain voltages. Resources that are close to load that also have the ability to generate power, reduce transmission losses and transmission congestion.

[21] http://files.brattle.com/files/7351_diversity_of_reliability_attributes.pdf.

As Figure 1 illustrates, natural gas provides 11 out of 12 identified key attributes—more than any other source of power.

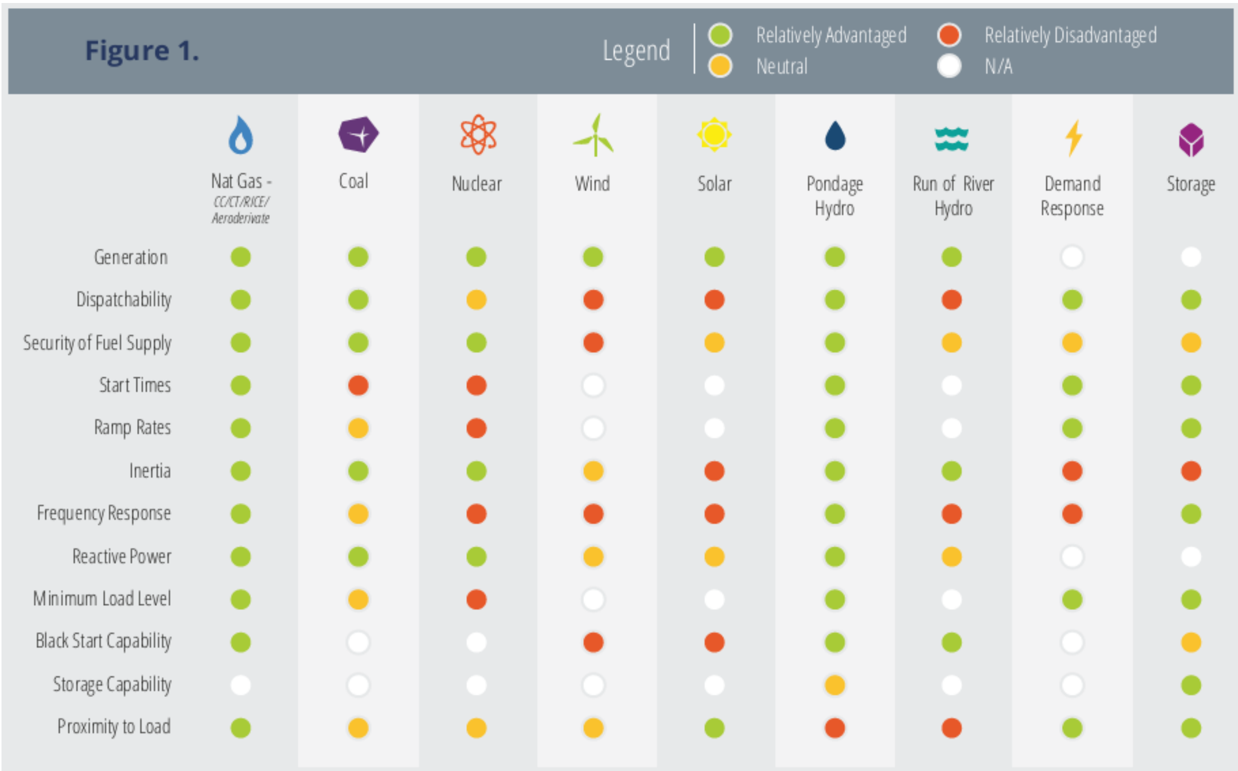

Figure 1[22]

2. Natural Gas is Resilient

The natural gas supply system is also resilient because it is not particularly vulnerable to weather-related events. A newly released report from the Natural Gas Council demonstrates the resiliency of our nation's natural gas industry – even in the face of extreme weather events or direct threats to the system, whether physical or cyber.[23] The report examined the remarkable reliability exhibited by the industry's preparation and actions during extreme conditions like the January 2018 "bomb cyclone" as well as hurricanes Harvey and Irma. The Natural Gas Council further cited the "Polar Vortex" of late January 2019—afflicting one third of the country—as yet another example where the resiliency of natural gas was demonstrated during extreme weather.[24] The report determined that the natural gas industry is not susceptible to wide-spread failure from a single point of disruption due to a number of factors:

- The dispersion of production and storage;
- Redundant characteristics from the extensive integrated pipeline and distribution network;

[22] https://www.api.org/news-policy-and-issues/blog/2017/10/04/in-power-generation-natural-gas-defines-reliability.
[23] Smead, Richard G., *Weather Resilience in the Natural Gas Industry: The 2017-2018 Test and Results (RBN Energy, LLC.*, August 2018).
[24] https://www.ipaa.org/natural-gas-proves-reliable-and-resilient-during-polar-vortex/.

- A physical configuration which limits vulnerability to weather-related events;
- Robust cyber and physical security protocols that minimize disruptions from manmade or computer threats; and,
- A resilient, interconnected system that allows it to come back on line quickly in the rare case of a disruption.[25]

The operation of the entire natural gas system—production, transmission, distribution, and storage—is highly flexible with strong elasticity characteristics. Modern infrastructure relies on control systems to help monitor, and in some cases operate the pipelines and its components to move the product in a reliable, efficient, and effective manner. Operators manage the internal pressure of the delivery system by controlling the amount of natural gas entering and leaving the system. The process of increasing or decreasing pressure happens relatively slowly in a natural gas system because of the compressible nature of the gas. This compressibility lessens the immediacy of impact and increases the probability of detection. Layered onto this control system architecture are overpressure protection devices that automatically activate, should the unlikely need arise, to prevent the internal gas pressure from threatening the pipeline's integrity.

Other characteristics of the natural gas system contribute to its historical operational resilience. The natural gas transportation network is composed of an extensive network of interconnected pipelines that offer multiple pathways for rerouting deliveries in the unlikely event of a physical disruption. In addition, pipeline capacity is often increased by installing two or more parallel pipelines in the same right-of-way (called pipeline loops), making it possible to shut off one loop while keeping the other in service. In the event of one or more compressor failures, natural gas pipelines can usually continue to operate at pressures necessary to maintain deliveries to pipeline customers, at least outside the affected segment. "Line pack"[26] in the pipelines can be used, if necessary, to provide operational flexibility.

Similarly, producers use various methods to help ensure operational continuity. Because producers have an economic incentive to continue to transport natural gas out of the producing field at a constant rate, many techniques are in place to help ensure that operations continue, or that any disruption is minimized when a problem arises. While not always possible, producers often rely on more than one processing plant or alternate pipeline rerouting options in a production area, especially when handling a significant level of production. In the unlikely event of an unavoidable supply disruption at a well or in a field, producers have many other options to balance their supply commitments, including increasing production in other areas or using stored natural gas.

While there are physical constraints on natural gas's ability to serve the entire electrical system—which could and should be addressed with a nationwide commitment to infrastructure

[25] Smead, Richard G., *Weather Resilience in the Natural Gas Industry: The 2017-2018 Test and Results (RBN Energy, LLC.*, August 2018).

[26] Line pack is the volume of natural gas contained within the pipeline network at any given time. It allows gas received in one area of a pipeline system to be delivered simultaneously elsewhere on the system. It can facilitate non-ratable flows and support pipeline reliability as a temporary buffer for imbalances. However, line pack must be kept reasonably stable throughout the system to preserve delivery pressure and system capacity. Thus, line pack neither creates incremental capacity, nor is it a substitute for appropriate transportation contracts.

investment—it is simply implausible to suggest that the need for increased natural gas transmission pipelines amounts to a lack of reliability. In fact, the opposite is true. The reliability and resilience of natural gas has allowed this clean energy resource to earn its share of the market while delivering affordable electricity to consumers across the country.

B. Proposed Approach to the "Significant Contribution Finding"

In the Proposed NSPS Amendments, EPA is proposing to retain the statutory interpretations that supported the 2015 NSPS.[27] While API is generally supportive of the Proposed EGU NSPS and, as discussed further in Subsection IIC below, specifically supports EPA's proposed decision to refrain from amending the Agency's 2015 standards of performance for natural gas combustion turbines, we continue to believe that the CAA compels EPA to make an endangerment finding that is specific to the source category and the precise pollutant that the Agency seeks to regulate. API apprised EPA of this interpretation in its comments on the rulemaking that ultimately resulted in the 2015 NSPS.[28] We have also raised this important issue with respect to EPA's 2016 "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources ("OOOOa").[29]

As we explained in those earlier comments, API believes that faithful adherence to the CAA's procedures for developing performance standards is as important as the standards themselves. Indeed, while API supports the standards and BSER analysis for natural gas-fired turbines that EPA finalized in the 2015 NSPS, we continue to believe that the Agency should revisit the process by which EPA determined whether the source category emits carbon dioxide in amounts that represent a "significant contribution" to endangerment of public health and welfare. Doing so can help ensure that these and any future NSPS are premised on solid and defensible legal foundations.

API appreciates that the Agency has recognized these concerns over EPA's adherence with the CAA's standard-setting procedures by requesting comment on the issue. In response to this request, we are herein restating API's position on the requirements of Section 111(b) and providing recommendations on ways to improve conformance with these statutorily mandated procedures.

1. CAA Section 111

With the CAA Amendments of 1970, Congress began requiring EPA to establish emission standards for new sources of air pollution that apply regardless of the source location or the ambient air quality of a particular region. As a prerequisite to source-specific regulation, Section 111 required EPA to publish and periodically update a list of source categories that "cause[], or significantly contribute[] to, air pollution which may reasonably be anticipated to endanger public health or welfare."[30] This preliminary step requires the Agency, first, to make an "endangerment finding" that the air pollution it intends to regulate from that source category "may reasonably be

[27] 83 Fed. Reg. at 65432.
[28] 80 Fed. Reg. 64,510 (Oct. 23, 2015).
[29] 81 Fed. Reg. 35,824 (June 3, 2016).
[30] CAA § 111(b)(1)(A).

anticipated to endanger public health or welfare."[31] Next, the Agency must determine that the source category "causes, or contributes significantly to" that air pollution.[32]

It is only after making these threshold findings (collectively referred to as an endangerment finding) that EPA may propose standards for new or previously listed source categories that "reflect[] the degree of emission limitation achievable through application of the best system of emission reduction."[33]

2. <u>EPA's 2009 Endangerment Finding</u>

In December 2009, EPA made an endangerment finding for cars and light duty trucks under Section 202(a) of the CAA ("2009 Endangerment Finding"). In the 2009 Endangerment Finding, EPA determined that "six greenhouse gases *taken in combination* endanger both the public health and the public welfare . . . ."[34] EPA "[s]pecifically . . . define[d] the 'air pollution' referred to in CAA section 202(a) to be the *mix of six long-lived and directly-emitted greenhouse gases* . . .,"[35] in the "aggregate".[36] EPA made clear that "the air pollution is the *combined mix* of six key directly-emitted, long-lived and well-mixed greenhouse gases . . . ."[37] The six greenhouse gases included in the aggregate in EPA's Section 202(a) endangerment finding were carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).[38] Of these six greenhouse gases, the 2015 NSPS and Proposed NSPS Amendments purport to regulate only CO_2.

3. <u>Reliance on the 2009 Endangerment Finding is Improper</u>

Although EPA has finalized the 2009 Endangerment Finding for greenhouse gas emissions from cars and light duty trucks under Section 202(a), that pollutant-based determination is not germane to Section 111's distinct legal standard. Nor can EPA rely on past endangerment findings under Section 111(b)(1)(A) because they were based on different pollutants (and potentially different sources) than those addressed in the NSPS for EGUs.

While other CAA sections broadly include all emissions sources for a given pollutant, authorizing the Administrator to regulate emissions "which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare,"[39] endangerment findings under Section 111(b)(1)(A) require analyses that are distinct, more demanding than other provisions of the CAA, and specific to each source category that EPA seeks to regulate. Under Section 111, the EPA Administrator is only permitted to regulate "*a category of sources* . . . if in his judgment it causes, or contributes *significantly* to, air pollution . . ." Therefore, unless EPA makes a specific determination that: (1) CO_2 emissions (2) from the

[31] CAA § 111(b)(1)(A).
[32] CAA § 111(b)(1)(A).
[33] CAA § 111(a)(1).
[34] 74 Fed. Reg. 66496, 66497 (Dec. 15, 2009) (emphasis added).
[35] 74 Fed. Reg. at 66497 (emphasis added).
[36] 74 Fed. Reg. at 66519.
[37] 74 Fed. Reg. at 66516 (emphasis added).
[38] 74 Fed. Reg. at 66516.
[39] CAA § 202(a)(1); *see also id.* § 108(a)(1)(A).

relevant source category (3) "cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare,"[40] the Agency cannot lawfully promulgate an NSPS.

4. EPA Cannot Substitute the Statutory Requirements of Section 111(b)(1)(A) with a Rational Basis Test

Rather than satisfying the plain requirement of Section 111 and making a CO_2-specific endangerment finding of significant contribution for fossil-fuel fired EGUs, EPA further asserted in the 2015 NSPS that, once the Agency has made an initial endangerment finding for a source category for any pollutant, it need only offer a rational basis for regulating additional pollutants, including CO_2, regardless of the relationship (or lack thereof) between the newly regulated pollutant and the initial endangerment determination.[41] This interpretation cannot be supported.

EPA justified its interpretation in the 2015 NSPS by incorrectly asserting that Section 111(b)(1)(A) is ambiguous and that EPA is authorized to fill a statutory gap regarding the content of the endangerment finding. But, the plain language of Section 111(b)(1)(A) establishes that the purpose of the NSPS program is to regulate and reduce emissions of significant "air pollution" that "endanger public health or welfare."[42] The approach EPA utilized in the 2015 NSPS divorced the endangerment determination from the subject of the regulation and therefore provided no assurance that the standards would serve to mitigate an actual and significant endangerment of public health or welfare. This interpretation of Section 111(b)(1)(A) irrationally allows EPA to impose standards for air pollutants that do not contribute significantly to an endangerment of public health or welfare. Thus, under the plain language of Section 111(b)(1)(A), the requirement to issue a pollution-specific endangerment finding is the mechanism that ensures that EPA does not issue costly regulations for air pollutants that need not be regulated under Section 111.

Section 111(b)(1)A) is not ambiguous at all in this respect, and therefore EPA's interpretation in the 2015 NSPS directly contradicts the plain language of this section. Section 111(b)(1)(A) requires EPA to list a category of stationary sources if, in the Administrator's judgment, the category "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[43] This section unambiguously requires EPA to list and regulate according to endangerment and significant contribution findings for particular pollutants. In the 2015 NSPS, however, EPA mistook its source of authority for an unlimited grant of authority. Read in context, however, the Act grants EPA narrowly bounded authority to regulate stationary sources that emit pollutants that may reasonably be anticipated to endanger public health or welfare *for those pollutants* which led to the endangerment finding and to which the source

[40] CAA § 111(b)(1)(A).
[41] 80 Fed. Reg. at 64,530.
[42] As explained above, NSPS are unique in that EPA's endangerment finding must be both source- and pollutant-specific. The 2015 NSPS's attempt to distinguish Section 111(b) from the pollutant-specific endangerment determinations in sections 211 and 231 are inapposite, as they only apply to specific source categories, motor vehicles and engines, and aircraft. The fact that NSPS endangerment determinations are unique to each source category supports the conclusion that they are also unique to each pollutant.
[43] CAA § 111(b)(1)(A).

category significantly contributes. The CAA does not grant EPA unlimited authority to regulate *any* pollutant emitted by that source.[44]

Applying the standard mandated by the CAA, there is no question that CO_2 emissions fall outside of EPA's prior endangerment and significant contribution findings under Subparts Da and KKKK.[45] These prior endangerment findings were all made before the Supreme Court decided, in *Massachusetts v. EPA*, that greenhouse gases were "air pollutants" under the CAA.[46] Until that time, EPA did not consider greenhouse gases—including CO_2—to be potentially subject to regulation as "air pollutants."[47] Thus, there is no question that the prior endangerment or significance findings for these source categories could not cover greenhouse gases, or, more specifically, CO_2, which was the pollutant specifically targeted by the 2015 NSPS.[48]

Second, even if the CAA were ambiguous, the statutory interpretation relied on in the 2015 NSPS is unreasonable and, therefore, not entitled to deference under *Chevron*.[49] Under the Agency's interpretation in the 2015 NSPS, EPA's regulation of *any* pollutant is limited only by EPA's prior determination that *an entirely different pollutant* endangers public health or welfare, that the source category's emissions of that different pollutant contribute significantly to that endangerment, and that there is somehow a "rational basis"—words not found in Section 111—to regulate other pollutants. This is not a test. It is an unlimited grant of authority for EPA to be the final arbiter of whether to regulate pollutants for which it has not made the necessary statutory findings.

Under EPA's interpretation, after a single endangerment and contribution finding for a source category, EPA could conceivably regulate any pollutant from that source category regardless of whether the source contributed significantly to the endangerment in question. This is not what Congress intended when it established such a high bar for regulation under Section 111(b).[50] EPA's interpretation is untethered to the statute—adrift in an unlimited "rational basis test" of the Agency's own creation. This is a patently unreasonable interpretation of the CAA.

Finally, even if EPA could apply a rational basis approach under Section 111(b), its application in the 2015 NSPS was clearly arbitrary because EPA's assertions about the large proportion of CO_2 emissions attributable to coal-fired EGUs does not, in and of itself, provide a rational basis for regulation.

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[44] *See Michigan v. EPA*, 268 F.3d 1075, 1081 (D.C. Cir. 2001) ("EPA is a federal agency—a creature of statute. It has . . . only those authorities conferred upon it by Congress . . . . [I]f there is no statute conferring authority, a federal agency has none.").
[45] See, e.g., 36 Fed. Reg. 5931 (Mar. 31, 1971).
[46] 549 U.S. 497 (2007).
[47] *Massachusetts v. EPA*, 549 U.S. at 511-12.
[48] The 2015 NSPS combined Subparts Da and KKKK into a new Subpart TTTT. While Subpart TTTT arguably represents a new source category, EPA at best made a cursory and superficial endangerment finding without any analysis. The 2015 NSPS for CO_2 emissions from Subpart TTTT was similarly flawed. 80 Fed. Reg. 64,530.
[49] *See, e.g.*, *Bluewater Network v. EPA*, 370 F.3d 11 (D.C. Cir. 2004).
[50] *See* CAA § 111(b)(1)(A).

C. EPA's Proposal to Refrain from Amending the Standards of Performance for Stationary Combustion Engines Reflects the Importance of Natural Gas in Power Generation

API supports EPA's proposed decision to refrain from amending or reopening the 2015 NSPS's BSER determination or standards of performance for new or reconstructed stationary combustion turbines. We supported these standards when EPA promulgated them in 2015, and continue to support them today because these standards were based on appropriate considerations of cost and technological feasibility, as well as a shared interest in ensuring that the many benefits of increased natural gas-fired power generation are realized.

In Section IIA above, API described the vital role of natural gas in power generation to ensure that the administrative record reflects that natural gas is reliable, abundant, affordable, and environmentally beneficial. In the subsections that follow, we also describe how the 2015 NSPS and EPA's proposed decision to retain the 2015 standards for combustion engines allows for the continued expansion of environmentally beneficial natural gas in power generation. We also provide comments on the types of combustion turbines subject to the 2015 NSPS, and whether refinements to the applicability of these standards are necessary or beneficial.

1. Support for Proposed Decision to Retain the 2015 NSPS

API supports EPA's proposal to refrain from amending or reopening the 2015 NSPS's standards for new and reconstructed base load[51] and non-base load[52] natural gas-fired and multi-fuel[53] stationary combustion turbines.

For newly constructed and reconstructed base load natural gas-fired stationary combustion turbines, EPA promulgated a standard of 1,000 lb CO_2/MWh-g based on efficient NGCC technology as the BSER.[54] Alternatively, the 2015 NSPS allowed owners and operators of base load natural gas-fired combustion turbines to comply with a standard based on net output of 1,030 lb CO_2/MWh-n.[55]

For newly constructed and reconstructed non-base load natural gas-fired stationary combustion turbines, EPA identified the combustion of clean fuels (natural gas with a small allowance for

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[51] The 2015 NSPS uses the term "base load natural gas-fired units" to refer to stationary combustion turbines that: (1) burn over 90 percent natural gas; and (2) sell electricity in excess of their design efficiency (not to exceed 50 percent) multiplied by their potential electric output. "To be in this subcategory, a stationary combustion turbine must exceed the 'natural gas-use criterion' on a 12-operating-month rolling average and the 'percentage electric sales' criterion on both a 12-operating-month and 3-year rolling average basis." 80 Fed Reg at 64601.

[52] The 2015 NSPS uses the term "non-base load natural gas-fired units" to refer to stationary combustion turbines that: (1) burn over 90 percent natural gas; and (2) have net-electric sales equal to or below their design efficiency (not to exceed 50 percent) multiplied by their potential electric output. "These criteria are calculated on the same rolling average bases as for the base load subcategory." 80 Fed Reg at 64601.

[53] "The term 'multi-fuel-fired' refers to a stationary combustion turbine that is physically connected to a natural gas pipeline, but that burns a fuel other than natural gas for 10 percent or more of the unit's heat input capacity during the 12-operating-month compliance period." 80 Fed Reg at 64513.

[54] 80 Fed. Reg. at 64,515.

[55] 80 Fed. Reg. at 64,515.

distillate oil) as the BSER with a corresponding heat input-based standard of 120 lb CO_2/MMBtu.[56] This standard of performance applied to the vast majority of simple cycle combustion turbines. Additionally, for newly constructed and reconstructed multi-fuel-fired stationary combustion turbines, the 2015 NSPS adopted an input-based standard of 120 to 160 lb CO_2/MMBtu based on the combustion of clean fuels as the BSER.

API supported the standards for combustion turbines in 2015 and continues to do so today. Unlike the 2015 NSPS's standards for coal-fired EGUs, EPA's BSER analysis for combustion turbines appropriately focused on technology that was currently used in commercial operations throughout the United States. The BSER analysis for combustion turbines also considered and meaningfully weighed other key factors such as cost, emissions profile, and potential adverse effects of unnecessarily stringent standards on the structure of the electric power sector.

D. Clarify Applicability to "Simple Cycle" Combustion Turbines

The 2015 NSPS utilized an imperfect and potentially problematic method of delineating between "combined cycle" and "simple cycle" combustion turbines. Rather than setting performance standards based on the functional differences between combined and simple cycle combustion turbines, the 2015 NSPS set separate standards for base load and non-base load stationary combustion turbines, and delineated the two standards based on the design efficiency of the combustion turbine.[57] Under the 2015 NSPS, stationary combustion turbines are deemed "non-base load", and thus qualify for less stringent standards of performance if they have net electric sales equal to or below their design efficiency (not to exceed 50 percent) multiplied by their potential electric output, (*e.g.*, a 40 percent efficient combustion turbine can sell up to 40 percent of its potential electrical output).[58] If net electric sales exceed this level, however, the 2015 NSPS treats the stationary combustion turbine as base load and subjects it to a more stringent standard of performance.[59] Because simple cycle turbines are generally only used to provide peaking power, EPA assumed that most simple cycle combustion turbines would qualify as non-base load combustion turbines subject to less stringent performance standards while combined cycle combustion turbines would be classified as base load combustion turbines subject to more stringent performance standards.

While EPA was correct to assume that most simple cycle combustion turbines would qualify as non-base load combustion turbines, the unique role of simple cycle combustion turbines in power generation suggests that a significant and growing number of these units may exceed the non-base load threshold and become subject to the more stringent performance standards otherwise applicable to combined cycle combustion turbines. Unlike combined cycle combustion turbines, simple cycle combustion turbines can cold start quickly, easily scale through loads, and start and stop several times per day. This flexibility allows them to fill the unique role of providing gap-filling auxiliary power at times of high demand or when the grid is under stress, or to stabilize the grid when power from renewable sources is intermittent. Indeed, the growing proportion of power generation that comes from renewable sources requires significant support from simple cycle

[56] 80 Fed. Reg. at 64,515.
[57] 80 Fed. Reg. at 64,514.
[58] 80 Fed. Reg. at 64,601.
[59] 80 Fed. Reg. at 64,601.

combustion turbines, which can quickly compensate for highly variable and often intermittent generation from baseload solar and wind facilities. These renewable baseload plants are subject to fluctuating wind speeds, cloud cover, and even the approach of birds. No other form of power generation covered by the 2015 NSPS is capable of filling this role.

In contrast, combined cycle combustion turbines require comparatively long times to cold-start and are less flexible in operating at partial loads. In fact, at the lower loads where simple cycle combustion turbines typically operate, combined cycle combustion turbines cannot engage the heat recovery steam generator, meaning that they are effectively operating in simple cycle mode with no efficiency benefits and thus with higher CO_2 emissions.

Combined cycle combustion turbines are designed for baseload power, meaning that they are very efficient and have a high utilization rate. Simple cycle combustion turbines, however, generally only provide peaking power. This means that their hours of operation are unpredictable, and they rarely operate at full load—the most efficient operating mode.

Accordingly, as renewable energy takes on a larger share of baseload power generation, there is increasing need for simple cycle combustion turbines to operate at capacity factors greater than their design efficiency. When operating at these higher capacity factors, however, the 2015 NSPS would subject these simple cycle combustion turbines to the more stringent standard of performance that could only be met by combined cycle combustion turbines. As a result, the operation of many simple cycle combustion turbines would likely be curtailed, which could shift generation to less efficient turbines with higher emissions profiles.

EPA can, and should, easily avoid this undesirable outcome by abandoning the current approach to distinguishing simple cycle turbines from combined cycle turbines based on net electric sales. In lieu of the net electric sales-based distinction, EPA should delineate the applicability of the NSPS based on the known and readily distinguishable differences between these two types of combustion turbines. This is precisely the approach EPA used in the Clean Power Plan and the proposed Affordable Clean Energy Rule.[60]

In addition to more precisely delineating between simple cycle and combined cycle combustion turbines, consistent with our 2014 comments on the proposed 2015 NSPS, API recommends that EPA exclude new, modified, and reconstructed simple cycle combustion turbines from NSPS applicability. While the changing nature of America's electricity supply is likely increasing the amount of power that simple cycle combustion turbines supply to the grid, there is no reasonable basis to assume that simple cycle combustion turbines will replace or delay the expansion of combined cycle combustion turbines. Simple cycle combustion turbines are simply not interchangeable with combined cycle combustion turbines in this way. The use of simple cycle combustion turbines for baseload power has generally involved much higher fuel and maintenance costs to generate the same amount of electricity as more efficient combined cycle combustion turbines.

[60] 83 Fed. Reg. at 44,783.

E. **<u>API Agrees with EPA's Proposed Determination that CCS is Not BSER for New Coal-Fired Steam Generating Units Because, Although CCS Can Feasibly be Utilized to Manage CO_2 Emissions in Some Scenarios, It is Not Broadly Feasible for These Units</u>**

The 2015 NSPS contained a conclusion that partial CCS was BSER for newly constructed coal-fired steam generating units.[61] In reaching that conclusion, EPA determined that the cost of partial CCS was reasonable relative to then-current nuclear power projects and could be absorbed by the coal-fired EGU industry.[62] The 2015 NSPS further concluded that partial CCS at newly constructed coal-fired EGUs was technically feasible throughout the majority of the United States, would achieve meaningful emission reductions, and would promote technological development.[63]

In the Proposed NSPS Amendments, EPA is now proposing to conclude that partial CCS would not qualify as BSER at newly constructed coal-fired steam generating units.[64] While API supports EPA's proposal to revise the 2015 BSER determination, we continue to believe that management of CO_2 emissions through utilization of CCS in a portfolio of energy technologies is viable in specific circumstances, and may be further developed and deployed in the future.

Continued investment in CCS demonstrates that CCS technology continues to advance and that CCS may be utilized as a viable CO_2 management option for certain projects. Nonetheless, we concur with EPA's analysis in the Proposed NSPS Amendments that some of the projects have experienced significant technical difficulties, reliability issues, and cost overruns that would have been detrimental to the projects had they not been receiving financial support from the government.

It is important to note that API's support for CCS does not conflict with our belief that this technology does not meet the CAA's requirements to qualify as BSER for newly constructed coal-fired steam generating units. As explained in our comments on the Clean Power Plan and the more recent proposed Affordable Clean Energy Rule, API supports development of CCS at both existing and new sources where operators determine that CCS is economically and technologically feasible. As we explained in our comments on the proposed 2015 NSPS, and again here, though API stands behind the potential future of CCS and some members are actively working toward its potential widespread viability, at this time CCS cannot be construed as a control which currently satisfies the CAA's rigorous test for demonstrating feasibility and continuous operation. API encourages EPA to find ways to facilitate the deployment of CCS by removing regulatory barriers.

1. <u>CCS Is Not BSER</u>

CCS technology continues to improve, and deployment continues to expand. Indeed, each of the technological components of CCS has been demonstrated at various projects. Industry has been capturing, transporting, and injecting carbon dioxide since the 1940s. More recent advancements have moved CCS down the cost curve of available CO_2 mitigation technologies.

Neither the pace of CCS development and deployment, nor our confidence in near-term CCS project achievements presently allow CCS to satisfy the CAA's BSER requirements. As described

[61] *See e.g.*, 80 Fed. Reg. at 64,513.
[62] *See e.g.*, 80 Fed. Reg. at 64,548.
[63] *See e.g.*, 80 Fed. Reg. at 64,513.
[64] 83 Fed. Reg. at 65,435.

below, the 2015 NSPS did not "adequately demonstrate" that CCS is BSER either under the plain terms of the CAA or judicial interpretations thereof. API therefore supports EPA's proposal to revise this determination.

i. Availability of Geologic Sequestration ("GS")

While API agrees with EPA that CCS is not BSER, we do not concur with the Proposed NSPS Amendments' characterization of the widespread unavailability of technically suitable GS sites.

EPA cites the large quantity of storage documented by the Department of Energy's Carbon Storage Atlas[65] but then concludes that "GS may not be as widely geographically available as assumed in the 2015 analysis." This is an odd conclusion in light of EPA's acknowledgement that "[s]ince the 2015 Rule, the EPA has updated its analysis on geographic availability."[66] And "[i]n general, these updates do not significantly change the EPA's understanding of which areas are amenable to GS."[67]

The Proposed NSPS Amendment go on to state that "[w]hile storage capacity appears large in the Atlas, site-specific technical, regulatory, and economic considerations will ultimately impact how much of that resource is economically available."[68] API agrees with this. The widespread deployment of CCS will require investment in pipeline infrastructure to transport captured CO_2 to suitable GS sites, but we do not agree with the Agency's proposed conclusions regarding the lack of technically suitable GS sites.

API requests that EPA consider this information, and more carefully differentiate between the availability of technically feasible geological sequestration sites and economically viable sequestration sites when it finalizes these NSPS amendments.

ii. Technological Feasibility of Carbon Capture Equipment

In comments on the 2015 NSPS, API challenged EPA's conclusions about the demonstrated technical feasibility of carbon capture equipment at coal-fired steam generating units. In particular, API argued that it was premature for EPA to conclude that CCS was broadly technologically feasible based solely on pilot-scale demonstrations and/or federally subsidized projects. Given the absence of any CCS project in use at a commercial-scale EGU at that time, we argued that CCS was not "adequately demonstrated" as the CAA demands.

API continues to believe that these projects are important and that the difficulties that have arisen are consistent with what would be expected when first attempting to demonstrate an emerging technology on a commercial-scale. While we are encouraged by these trends and continue to be optimistic about CCS, we agree with EPA's proposed determination that the currently available data do not demonstrate that CCS will perform reliably for new coal-fired steam generated units under the requirements of the CAA. This is especially true because NSPS standards go into effect immediately. Any standards of performance that EPA finalizes as part of this rulemaking will apply to EGUs that commence construction, reconstruction, or modification after the date of the

[65] Carbon Storage Atlas - Fifth Edition (Atlas V) (2015). https://www.netl.doe.gov/research/coal/carbon-storage/atlas.
[66] 83 Fed. Reg. at 65,441.
[67] 83 Fed. Reg. at 65,441.
[68] 83 Fed. Reg. at 65,441.

Proposed NSPS Amendments (December 20, 2018). Similarly, EGUs that commenced construction after the date of the proposal for the 2015 NSPS and before the date of these Proposed NSPS Amendments remain subject to the standards of performance promulgated in the 2015 NSPS.

2. Reasonableness of the Cost of CCS

As noted above, when evaluating standards of performance, CAA Section 111(a)(1) requires EPA to consider "the cost of achieving" the required emission reductions. Although EPA has some discretion in determining the manner in which the Agency will consider costs, courts have instructed that EPA may not adopt a standard the cost of which would be "exorbitant,"[69] "greater than the industry could bear and survive,"[70] "excessive,"[71] or "unreasonable."[72] These judicial interpretations, while sparse, provide the guideposts for EPA's consideration of the "reasonableness of costs."

In the 2015 NSPS, EPA evaluated the costs for new base load electricity generating options to determine whether CCS costs were reasonable. Given that projections in 2015 from the EPA, EIA, and utility planners consistently showed NGCC as the lowest cost option for new intermediate and base load generation, even modest additional compliance costs imposed on the higher-cost option (coal-fired EGUs) would be detrimental to the source category, and therefore unreasonable. The 2015 NSPS, however, avoided concluding that it was unreasonable to impose substantial new compliance costs on new coal-fired EGUs that already could not compete with the low cost of NGCC power generation by refraining from comparing the cost of electricity generated by coal-fired EGUs to the cost of NGCC-generated electricity.

EPA argued that it was reasonable to exclude natural gas-fired EGUs from this "reasonable cost" analysis based on the Agency's belief that, notwithstanding the significantly lower cost of natural gas-fired power generation, utilities would continue to value the fuel-diversity provided by coal-fired EGUs.[73] With low-cost and reliable natural gas removed from the equation, EPA was free to determine that the levelized cost of electricity ("LCOE") for a new coal-fired EGU would be "reasonable" if it was consistent with the LCOE associated with the construction of a new nuclear power plant.

In the Proposed NSPS Amendments, EPA ably details significant flaws in the LCOE analysis and other measures of cost that were not considered in the 2015 NSPS. API discussed many of these same concerns in our 2014 comments and need not restate than here. While we support EPA's proposed cost reanalysis, API believes that EPA should go further in reconsidering the rationality of omitting NGCC from the LCOE analysis.

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[69] *Lignite Energy Council* v. *EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999).
[70] *Portland Cement Ass'n* v. *EPA*, 513 F.2d 506, 508 (D.C. Cir. 1975).
[71] *Sierra Club* v. *Costle*, 657 F.2d at 343 (D.C. Cir. 1981).
[72] *Sierra Club* v. *Costle*, 657 F.2d at 343 (D.C. Cir. 1981).
[73] 80 Fed. Reg. at 64,510.

The superior cost, availability, and reliability of natural gas was well demonstrated in 2015, and evidence of these attributes has only expanded in the ensuing years. EPA should therefore reconsider whether it is appropriate for its analysis of cost reasonableness to be driven by the somewhat speculative notion that coal-fired EGUs may be favored in some marginal or localized portfolio decisions.

To EPA's credit, when discussing the unreasonableness of CCS capital costs, the Agency does recognize the role played by natural gas in power generation decisions. In the Proposed NSPS Amendments' argument against the 2015 NSPS's conclusion that the presumed 12 percent increase in capital costs attributable to CCS was reasonable because it was lower than the percent increase for the Portland Cement NSPS, EPA noted that the 2015 NSPS "did not account for the loss of sales (*i.e*., revenue) in the electricity market."[74]

> . . . for coal-fired EGUs, an increase in operating costs has an impact on dispatch order and thus product (*i.e*., electricity) sales, and therefore, the overall cost of the partial CCS BSER determination. That is, the ability of EGUs to pass along their capital costs to consumers depends on their ability to pass along their operating costs to consumers. However, higher operating costs that impact the EGU dispatch order cannot be passed on to end users as easily (and profit margins cannot be narrowed as easily) without affecting coal-fired generation's competitiveness with alternate forms of electricity generation. This means that EGUs cannot pass along their capital costs as easily as other industries.[75]

EPA clearly recognizes the outsized role natural gas plays in shaping the economics of power generation and decisions about future capacity. API recommends that EPA fully consider this role, as well as the environmental benefits of natural gas-fired power generation, as it considers these amendments.

F. CHP Exclusion

The 2015 NSPS excluded from the definition of "affected EGUs" combined heat and power ("CHP") units that are subject to a federally enforceable permit limiting annual net electric sales to no more than either the unit's design efficiency multiplied by its potential electric output, or 219,000 megawatt-hours (MWh)—whichever is greater. While API supports the 2015 NSPS's exclusion of CHP units, we agree with EPA's conclusion in the Proposed NSPS Amendments that the manner in which the 2015 NSPS attempted to exclude CHP units was difficult to demonstrate, overly restrictive, and, as a result, likely caused some CHP units to remain subject to the performance standards.[76] As such, API believes that the NSPS should be amended so that industrial CHP units are clearly and completely excluded from the universe of affected EGUs through the simplest possible means of determining applicability.

CHP power generation by industrial facilities creates both environmental and economic benefits. By capturing and using waste heat from the production of electricity, CHP units help reduce CO_2 emissions through significant efficiency gains. CHP units produce lower CO_2 emissions and

[74] 83 Fed. Reg. 65,440.
[75] 83 Fed. Reg. 65,440.
[76] 83 Fed. Reg. at 65,459-65,460.

typically are more economic to operate compared to conventional boilers. Because combined generation is more efficient than separate generation of heat and power, EPA has observed that:

> CHP requires less fuel to produce a given energy output, and because less fuel is burned to produce each unit of energy output, CHP reduces the emission of greenhouse gases and other air pollutants. CHP has comparatively lower emissions rates and can be more economic than separate electric and thermal generation.[77]

EPA predicts that an additional 50 GW of power could be deployed by CHP units by 2020, resulting in significant emissions reductions and cost savings.[78] CHP is also a critical component to the U.S. Department of Energy initiative to increase the amount of industrial distributed energy in the United States.

Industrial CHP units also serve a fundamentally different purpose from commercial EGUs. The primary purpose of a CHP unit is to produce thermal and electric energy for an industrial facility. While excess electricity (if available) may be supplied to the grid, industrial CHP units are not intended to provide a majority of the units' energy output to the public power grid. Excluding industrial CHP units recognizes these fundamental differences and creates incentives to increase the capacity of CHP in the United States.

Additionally, industrial CHP units are typically customized to suit the needs of a host facility. As a result, no two CHP units typically balance the output of thermal energy and electricity production in the same manner, and this balance of thermal and electricity production for any particular CHP unit changes with time. The oil and gas industry utilizes CHP units in both refining and upstream sectors, and the use of the electricity generated varies significantly by operation and facility. These variations make it difficult to craft a comprehensive CHP unit exclusion criteria based on thermal energy output or electricity production.

As such, in order to avoid the imprecision inherent in defining the precise types of CHP units subject to the exclusion, API recommends that EPA exclude all industrial CHP units from the NSPS.

- EPA could craft language to write all industrial CHP facilities out of the EGU definition.
- EPA could rely on facility SIC or equivalent codes to exclude CHP units at facilities that are classified as industrial. For example, exempt all gas-fired CHPs that are associated with Refinery SIC code 2911, Oil and Gas SIC code 13, and other SIC codes as appropriate.

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[77] 79 Fed. Reg. at 34,982.
[78] See EPA, Combined Heat and Power: Frequently Asked Questions.

G. Natural Gas Co-Firing as a Compliance Option

EPA has requested comment on the Agency's 2015 determination that, while natural gas co-firing is an acceptable alternative method of compliance, it is not BSER.[79] API supports this determination.

Natural gas co-firing has a longstanding and important role in coal-fired power-production, and the benefits of natural gas co-firing go well beyond the reduction of greenhouse gas emissions. Natural gas co-firing is necessary for the efficient operation of many coal-fired utilities by aiding in coal combustion during start-up and to maintain temperature in units during stand-by periods. In addition to operational benefits, many coal-fired utilities co-fire natural gas to aid in the control of nitrogen oxides ("NO_x") and as a means of reducing CO_2 emissions. EPA should therefore ensure that the NSPS retains natural gas co-firing as a compliance option.

It is in the interest of States and power grid operators to have clean and reliable fuel for power generation. Abundant and affordable natural gas has been a key driver of reliability in power generation. EPA should allow and encourage States to act in the best interest of electricity consumers by choosing the least expensive and most efficient compliance solutions. Where optional compliance programs, such as trading or credit programs, are envisioned in State plans, the lower emissions profile of natural gas should be given appropriate credit for the role it plays in reducing emissions.

Additionally, while API is not asking EPA to reconsider its determination that natural gas co-firing does not qualify as BSER, we would like EPA to reevaluate some of the rationales it employed when making this decision.

For instance, EPA suggests that natural gas co-firing should be disfavored because it diverts natural gas from more efficient NGCC units in order to achieve more modest emission improvements in less efficient coal-fired units.[80] While API agrees that NGCC units are far more efficient than coal-fired units (even with natural gas co-firing), we do not agree with the Agency's suggestion that co-firing natural gas in coal units precludes NGCC use or expansion. The implication of scarcity underlying this concern is simply baseless. Natural gas is a reliably abundant source of energy in the United States.[81] It is similarly inaccurate for EPA to suggest that the need for more natural gas pipeline infrastructure makes natural gas co-firing a compliance option available in only a few select regions. While more natural gas pipeline infrastructure is indeed necessary, it is not credible to suggest that natural gas-based compliance options are anything less than widespread and widely available. In 2017, natural gas was actually the largest source (about 32 percent) of United States electricity generation.[82] The United States has nearly 1,800 natural gas-powered electricity plants in nearly every State. Natural gas-fired facilities represent over 30 percent of plants in 23 States, and over 50 percent in 10 more States.[83]

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[79] 83 Fed. Reg. at 65431.
[80] See 83 Fed. Reg. at 65,445.
[81] https://www.api.org/oil-and-natural-gas/wells-to-consumer/exploration-and-production/natural-gas/natural-gas-americas-clean-energy.
[82] https://www.eia.gov/energyexplained/index.php?page=electricity_in_the_united_states.
[83] https://www.washingtonpost.com/graphics/national/power-plants/?noredirect=on&utm_term=.c4c3478dea44.

H. Conclusion

API appreciates the opportunity to provide these comments. If you have any questions, please contact me at (202) 682-8340.

Sincerely,

/s/

Howard J. Feldman