Submitted Electronically

March 18, 2019

Mr. Christian Fellner
Sector Policies and Program Division (D205-01)
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

RE: CALIFORNIA AIR RESOURCES BOARD'S COMMENTS ON PROPOSED RULE - REVIEW OF STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FROM NEW, MODIFIED, AND RECONSTRUCTED STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS

DOCKET NO. EPA-HQ-OAR-2013-0495

Dear Mr. Fellner:

The California Air Resources Board (CARB) submits this comment letter, including the attached technical comments and exhibits, to the United States Environmental Protection Agency (EPA) on the Proposed Rule entitled "Review of Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units", 83 Fed. Reg. 65424 (Dec. 20, 2018) (hereinafter, the Proposed Rule).

If finalized, the Proposed Rule would allow new coal-fired steam electric generating units (EGUs) to emit more greenhouse gas (GHG) emissions, compared to EPA's 2015 New Source Performance Standard for new EGUs (2015 NSPS). In the 2015 NSPS, EPA determined, on the basis of substantial support, that the best system of emission reduction (BSER) for new coal-fired steam units is supercritical boiler technology with partial carbon capture and sequestration (CCS), resulting in an emission standard of 1,400 pounds of carbon dioxide/ megawatt-hour (lb CO_2/MWh). EPA now proposes to significantly cut the stringency of the NSPS—to 1,900 lb CO_2/MWh for large coal-fired steam units and 2,000 lb CO_2/MWh for smaller coal-fired steam units—based on EPA's newfound belief that CCS is not BSER.

EPA's proposal is unjustified. The 2015 NSPS continues to reflect BSER because CCS is technically feasible, cost-effective, and achieves more emissions reductions than the Proposed Rule. Indeed, the 2015 NSPS was proposed prior to the operation of any large-scale CCS project for power generation; now, there are two coal-fired power plants operating with CCS. The Proposed Rule is also unreasonable because it would essentially do

nothing to reduce emissions from new coal-fired power plants compared to no regulation at all.

California is experiencing severe impacts from climate change. The Camp Fire, fueled by drought and exacerbated by climate change, swept through Northern California last November, taking 86 lives and causing billions of dollars of property damage. Previous to this, the 2015 drought cost the agricultural industry, in the Central Valley, an estimated $2.7 billion and 20,000 jobs. More climate change-fueled wildfires and other impacts can be expected with unabated GHG emissions. Every GHG emission contributes to climate change impacts, with the most vulnerable communities bearing a disproportionate burden. In light of the climate crisis, which grows starker with every new tragedy and every new exhaustive governmental report, EPA's do-nothing approach to GHG emissions from new power plants is arbitrary and capricious.

Yet, EPA argues that it may not have to regulate GHG emissions from new coal-fired EGUs at all because of existing trends in the power sector. EPA's suggestion, buried in a footnote in the Proposed Rule, is alarming. Now is the time to reduce GHG emissions to the maximum extent permissible under the law, and wherever possible. Existing power sector trends could reverse and new coal-fired power plants may be constructed in the future. In light of that possibility, EPA should ensure that a clear regulatory signal is established and maintained that will secure long-term emissions reductions in the power sector, regardless of shifts in power sector trends. The 2015 NSPS achieves that goal; the Proposed Rule does not.

Rather than finalize this deeply flawed proposal, EPA should instead withdraw the Proposed Rule and conclude the ongoing litigation regarding the 2015 NSPS.

Please feel free to contact me at (916) 322-7077 or richard.corey@arb.ca.gov to discuss any of these issues. Thank you for your consideration.

Sincerely,

Richard W. Corey
Executive Officer
California Air Resources Board

Attachment: Technical Comments of the California Air Resources Board on the Proposed Rule (with exhibits)

Technical Comments of the California Air Resources Board on the "Review of Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units" Proposed Rule

The California Air Resources Board (CARB) submits these technical comments and exhibits to the United States Environmental Protection Agency (EPA) on the Proposed Rule entitled "Review of Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units", 83 Fed. Reg. 65424 (Dec. 20, 2018) (hereinafter, the Proposed Rule).

I. EPA's Failure to Regulate GHG Emissions from New Coal-fired EGUs would be Wholly Unreasonable and Contrary to the Endangerment Finding

In a footnote buried in the Proposed Rule, "EPA solicits comment on whether the Agency has a rational basis for regulating CO_2 emissions from new coal-fired electric utility steam generating units and whether it would have a rational basis for declining to do so at this time, in light of, among other things, the following: (i) ongoing and projected power sector trends that have reduced CO_2 emissions from the power sector due to reduced coal-fired generation; and (ii) no more than a few new coal-fired EGUs can be expected to be built, which raises questions about whether new coal-fired EGUs contribute significantly to atmospheric CO_2 levels."[1] As discussed below, EPA clearly has a rational basis for regulating CO_2 emissions from new coal-fired EGUs, and it would be arbitrary and capricious for EPA to fail to regulate the CO_2 emissions from new coal-fired power plants. CARB adamantly opposes any effort by EPA to fail to regulate the largest stationary source category of GHG emissions.

a. EPA Has a Rational Basis to Regulate GHG Emissions from New Coal-fired Power Plants

Section 202 of the Act states that EPA "shall by regulation prescribe ... standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in [EPA's] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."[2] More than a decade ago, the U.S. Supreme Court in *Massachusetts v. EPA* held that GHG emissions are unambiguously air pollutants and that EPA therefore must decide whether GHG emissions

[1] Proposed Rule at 65432, note 25.
[2] 42 U.S.C. § 7521(a)(1).

cause or contribute to climate change pursuant to CAA section 202.[3] In response to *Massachusetts v. EPA*, EPA issued the Endangerment Finding, which states that "[p]ursuant to CAA Section 202(a), [EPA] finds that greenhouse gases in the atmosphere may reasonably be anticipated both to endanger public health and to endanger public welfare."[4]

When EPA promulgated the section 111(b) rule to control GHG emissions from new EGUs (i.e., the 2015 NSPS), it stated "EPA has a rational basis for concluding that emissions of CO_2 from fossil fuel-fired power plants, which are the major U.S. source of GHG air pollution, merit regulation under CAA section 111."[5] The 2015 NSPS cited the 2009 Endangerment Finding and the United States Court of Appeals, District of Columbia Circuit's (D.C. Circuit) decision in *Coalition for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102 (D.C. Cir. 2012)[6] as demonstrating the validity of the underlying science analyzed in the Endangerment Finding, while indicating that "[n]o information that commenters have presented or that the EPA has reviewed provides a basis for reaching a different conclusion."[7]

Specifically, EPA found that "EGUs emit almost one-third of all U.S. GHGs and comprise by far the largest stationary source category of GHG emissions."[8] EPA also found that "[t]he CO_2 emissions from even a single new coal-fired power plant may amount to millions of tons each year..."[9] In turn, EPA stated that "[i]t is not necessary in this rulemaking for the EPA to decide whether it must identify a specific threshold for the amount of emissions from a source category that constitutes a significant contribution; under any reasonable threshold or definition, the emissions from combustion turbines and steam generators are a significant contribution."[10] Based on the foregoing, the 2015 NSPS determined that "the high level of GHG emissions from fossil fuel-fired EGUs makes clear that it is rational for the EPA to

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[3] *Massachusetts v. EPA*, 549 U.S. 497, 528-35 (2007).
[4] Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule, 74 Fed. Reg. 66496, 66497 (Dec. 15, 2009) (hereinafter, Endangerment Finding).
[5] Final Rule, Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64510, 64530 (Oct. 23, 2015) (hereinafter, 2015 NSPS).
[6] The D.C. Circuit in *Coal. for Responsible Regulation* upheld the Endangerment Finding, holding that "[r]elying again upon substantial scientific evidence, EPA determined that anthropogenically induced climate change threatens both public health and public welfare." *Coal. for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 121 (D.C. Cir. 2012), *aff'd in part, rev'd in part sub nom. Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427 (2014). The Court also held that substantial evidence supported EPA's determination that motor-vehicle GHG emissions contribute to climate change and thus to the endangerment of public health and welfare. *Id.* Therefore, the Endangerment Finding has been dispositively approved by the courts and is unimpeachable as a factual and legal matter.
[7] 2015 NSPS, at 64530.
[8] *Id.* at 64530.
[9] *Id.* at 64531.
[10] *Id.*

regulate GHG emissions from this sector."[11] The 2015 NSPS also stated: "Likewise, if the EPA were required to make a cause-or-contribute-significantly finding for CO_2 emissions from the fossil fuel-fired EGUs as a prerequisite to regulating such emissions under CAA section 111, the same facts that support our rational basis determination would support such a finding."[12] Therefore, the Endangerment Finding and EPA's analysis of its authority and duty to regulate GHG emissions from fossil fuel-fired EGUs in the 2015 NSPS stands.

Since the 2009 Endangerment Finding (and even since the 2015 NSPS), more recent scientific reports uniformly depict the threat of climate change becoming even graver, and emphasize the need to control GHG emissions immediately.[13] For instance, the U.S. Global Change Research Program's (USGCRP) Fourth National Climate Assessment (Fourth Assessment), issued in parts in 2017 and 2018, finds that "[t]he last few years have also seen record-breaking, climate-related weather extremes, and the last three years have been the warmest years on record for the globe. These trends are expected to continue over climate timescales."[14] The Fourth Assessment also found that "[w]ith continued growth in emissions at historic rates, annual losses in some economic sectors are projected to reach hundreds of billions of dollars by the end of the century—more than the current gross domestic product (GDP) of many U.S. states."[15] The Intergovernmental Panel on Climate Change (IPCC) has recently concluded that it is critically important to constrain warming to 1.5 degrees Celsius, which requires steep emissions cuts by 2030.[16] Therefore, EPA continues to have a rational basis for regulating the GHG emissions from new EGUs because the Endangerment Finding remains valid and climate science continues to demonstrate the impacts of GHG emissions and the need to regulate GHG emissions.

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[11] *Id.*
[12] *Id.* at 64531.
[13] California is particularly vulnerable to the climate crisis. *See* Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, "Indicators of Climate Change in California" (2018), available at: https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf. Attached as Exhibit 1. This report indicates that, in California, "[e]xtremely hot days and nights — that is, when temperatures are at or above the highest 2 percent of maximum and minimum daily temperatures, respectively — have become more frequent since 1950. Both extreme heat days and nights have increased at a faster rate in the past 30 years." *Id.* at S-5.
[14] USGCRP, 2017: Climate Science Special Report: Fourth National Climate Assessment, Volume I [Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.)], at 1. Attached as Exhibit 2.
[15] USGCRP, 2018: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II, Report-in-Brief [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)], at 13. Attached as Exhibit 3.
[16] IPCC, Summary for Policymakers, *Global Warming of 1.5 °C* (2018), available at: http://www.ipcc.ch/report/sr15/ (hereinafter, IPCC 1.5 °C Report). Attached as Exhibit 4. The IPCC 1.5 °C Report finds that "[i]n model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO_2 emissions decline by about 45% from 2010 levels by 2030 (40–60% interquartile range), reaching net zero around 2050 (2045–2055 interquartile range)." *Id.* at SPM-15.

b. EPA Does Not Have a Rational Basis for Declining to Regulate New Coal-fired Power Plants

The Supreme Court has stated that an agency must "provide a more detailed justification than would suffice for a new policy…when, for example, its new policy rests upon factual findings that contradict those which underlay its prior policy… It would be arbitrary and capricious to ignore such matters." *FCC v. Fox Television Stations*, 566 U.S. 502, 515-16 (2009) (internal citation omitted).

EPA does not have a rational basis to decide against regulating coal-fired EGUs. Indeed, it would be arbitrary and capricious to fail to regulate the CO_2 emissions from new power plants in light of the factual findings underlying the 2015 NSPS. As EPA stated in the 2015 NSPS, "[l]ike the Endangerment Finding under section 202(a) at issue in *State of Massachusetts v. EPA*, 549 U.S. 497 (2007) the pertinent issue is a scientific inquiry as to whether an endangerment to public health or welfare from the relevant air pollution may reasonably be anticipated. Where, as here, the scientific inquiry conducted by the EPA indicates that these statutory criteria are met, [EPA] does not have discretion to decline to make a positive endangerment finding to serve other policy grounds."[17] Failing to regulate new coal-fired EGUs based on other policy grounds would effectively be a factually baseless repudiation of EPA's well-supported analysis in the 2015 NSPS regarding how power plants endanger public health and welfare.

Additionally, a decision to not regulate GHG emissions from coal-fired EGUs would be unreasonable in light of the structure of section 111. Namely, section 111 focuses on categories of sources that emit dangerous pollution. If a category is listed due to it causing or contributing significantly to air pollution which endangers public health or welfare from one pollutant, then EPA should prioritize regulating the category for all other pollutants that cause endangerment as well. Here, EGUs were a regulated source category for other pollutants prior to being regulated for GHG emissions by the 2015 NSPS. Additionally, EPA must take into account the quantity of emissions which each category emits in prioritizing which standards to promulgate.[18] The quantity of GHG emissions that EGUs emits strongly militates in favor of regulation, and EPA has yet to present an argument as to why failing to regulate EGUs would be permissible.

EPA may be proposing to deregulate new sources under section 111(b) as a backdoor to deregulate existing sources under section 111(d) given the interlocking nature of section 111(b) and section 111(d) regulation. To the extent this is the case, CARB adamantly opposes EPA's approach. Failing to regulate existing power plants would be patently

[17] 2015 NSPS at 64531, note 109.
[18] 42 U.S.C. § 7411(f).

unreasonable in light of the Endangerment Finding and the climate crisis. While EPA may assert that regulation under section 111(b) is unnecessary because emissions from new EGUs are hypothetical (a view that CARB disputes below), emissions from existing EGUs are significant and are occurring now. Therefore, EPA cannot use its narrow arguments about emissions from new EGUs as a basis to undermine regulation of GHG emissions from existing EGUs.

As discussed below, the two bases that EPA suggests might support neglecting to regulate new coal-fired EGUs do not, in fact, serve as valid reasons to exempt new plants from regulation. CARB discusses each of EPA's points below.

i. Power Sector Trends Do Not Justify Failing to Regulate EGUs

EPA suggests that ongoing and projected power sector trends that have reduced CO_2 emissions due to reduced coal-fired generation might provide a rational basis to decline to regulate CO_2 emissions from new coal-fired EGUs. They do not.

The USGCRP found that "[s]tabilizing global mean temperature to less than [2 °C] above preindustrial levels requires substantial reductions in net global CO_2 emissions prior to 2040 relative to present-day values and likely requires net emissions to become zero or possibly negative later in the century."[19] The IPCC also found that, in order to limit warming to below 2 °C, global net anthropogenic CO_2 emissions would need to decline by about 20% from 2010 levels by 2030 and reach net zero by 2075.[20]

In light of this context, failing to reduce emissions from new power plants based on past power sector trends would be wholly unreasonable. The power sector—and coal-fired power specifically—is still one of the largest sources of GHG emissions in the U.S. and is expected to remain so. While total electricity sector emissions have been trending downwards in the last few years, power plants still emitted nearly 1.8 billion tons of CO_2e in 2017, according to EPA data.[21] In 2016, emissions from the power sector and the transportation sector were essentially tied for being the largest source of U.S. GHG emissions (i.e., 28.4 percent for the power sector and 28.5 percent for the transportation sector).[22]

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[19] USGCRP Fourth Assessment, Vol. 1, at 393.
[20] IPCC 1.5 °C Report, at SPM-15.
[21] EPA, Greenhouse Gas Reporting Program Data, https://www.epa.gov/ghgreporting/ghgrp-reported-data#reported-emissions. Attached as Exhibit 5.
[22] *See* EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016, Executive Summary, at ES-24, https://www.epa.gov/sites/production/files/2018-01/documents/2018_executive_summary.pdf. Attached as Exhibit 6.

Furthermore, EPA's economic analysis indicates that the Proposed Rule would result in an estimated increase of 1.1 million tons/year of CO_2 for every large (600 MW) baseload coal-fired EGU compared to the 2015 NSPS.[23] The fact that the Proposed Rule could result in more than a million tons of CO_2 *if even one new EGU is constructed* demonstrates that coal-fired EGUs contribute significantly to endangerment. Indeed, after noting the quantity of "[t]he CO_2 emissions from even a single new coal-fired power plant" in the 2015 NSPS, EPA stated that "under any reasonable threshold or definition, the emissions from combustion turbines and steam generators are a significant contribution."[24] Therefore, at a time when we must do everything possible to reduce emissions, failing to regulate these sources of GHG emissions is irrational.

Additionally, coal-fired power plants produced approximately the same amount of electricity as natural gas-fired power plants in 2017, according to Energy Information Administration (EIA) data.[25] However, given that coal-fired power is more polluting than natural gas-fired power, this means that coal-fired power plants are still producing more GHG emissions than any other power source. Indeed, in 2016, coal-fired power produced approximately 1.2 billion tons of CO_2 compared to gas-fired power producing 546 million tons of CO_2.[26] In light of the findings of the USGCRP and the IPCC, failing to regulate a source category that already emits 1.2 billion tons of CO_2 each year is arbitrary and capricious.[27]

Beyond the fact that coal-fired power still emits more than one billion tons of CO_2 per year, existing power sector trends could reverse. Indeed, while EPA projects that the Proposed Rule will not result in significant CO_2 emission changes because no new coal-fired power plants are projected to be built, EPA acknowledges that "many of the inputs are uncertain. In this context, notable uncertainties, in the future, include the cost of fuels, the cost to operate existing power plants, the cost to construct and operate new power plants, infrastructure, demand, and policies affecting the electric power sector…future realizations could deviate from these expectations as a result of changes in wholesale electricity markets, federal policy intervention, including mechanisms to incorporate value for onsite fuel storage, or substantial shifts in energy prices."[28]

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[23] EPA, Economic Impact Analysis for the Proposed Rule, at 2-3 (Dec. 2018), *available at*: https://www.epa.gov/sites/production/files/2018-12/documents/utilities_eia_proposed_nsps_2018-12.pdf.
[24] 2015 NSPS, at 64531.
[25] EIA, Monthly Energy Review January 2019, at 124, https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf. Attached as Exhibit 7.
[26] *See* EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016, Chapter 3, at 3-7, Table 3-6.
[27] To the extent that EPA fails to regulate new coal-fired EGUs under section 111(b) and uses that as a pretext to not regulate existing coal-fired EGUs under section 111(d), then current GHG emissions from coal-fired EGUs must be highly relevant to EPA's determination of whether to regulate the source category.
[28] Proposed Rule at 65427.

For instance, as global natural gas demand increases and the U.S. builds more LNG export terminals, natural gas prices could increase, which, in turn, could make new coal-fired power plants attractive again.[29] In fact, the Department of Energy's Assistant Secretary for Fossil Energy Steve Winberg recently stated that it's "quite possible" that new coal-fired plants could be built in the future, depending on the price of natural gas.[30] Additionally, large-scale electrification of end uses (including electric vehicles) will lead to an overall increase in load demand, which may be satisfied (even in small part) by new coal-fired EGUs.[31] In the context of a rapidly evolving power sector and unclear regulatory landscape, it is more important now than ever to reaffirm the 2015 NSPS to ensure a clear regulatory signal vis-à-vis new coal-fired EGUs and secure continued emissions reductions from these sources.

ii. Current Expectations about New Coal-fired EGU Construction Do Not Justify Failing to Regulate EGUs

EPA also suggests that it might have a rational basis for declining to regulate GHG emissions from new coal-fired EGUs because no more than a few new coal-fired EGUs can be expected to be built, which raises questions, in EPA's view, about whether new coal-fired EGUs contribute significantly to atmospheric CO_2 levels. This is not a valid reason for EPA to decline to regulate new coal-fired power plants.

The EIA's most recent Annual Energy Outlook projects that coal-fired generating capacity declines through 2050, with 101 gigawatts (GW) (or 42% of existing coal-fired capacity) projected to retire by 2050.[32] However, it is important to note that EIA's projections of the power sector, like any forecasts of complex economic sectors, can change from year-to-year based on a multitude of factors. Indeed, as discussed above, existing power sector trends could reverse in the future, which is why a stringent NSPS for new coal-fired power plants is

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[29] *See* Reuters, "Rising LNG demand to exert more pull on U.S. natural gas prices" (Dec. 19, 2018), https://www.reuters.com/article/us-usa-lng-prices-analysis/rising-lng-demand-to-exert-more-pull-on-u-s-natural-gas-prices-idUSKCN1OJ0H9 (stating "LNG exports are expected to rise to 5 percent of overall U.S. gas demand in 2019 and to 10 percent in 2024, according to the U.S. Energy Information Administration (EIA), boosting LNG's potential to affect prices"). Attached as Exhibit 8.

[30] Utility Dive, "DOE fossil head: New US coal plants 'quite possible'" (Jan. 29, 2019), https://www.utilitydive.com/news/doe-fossil-head-new-us-coal-plants-quite-possible/547113/ ("I don't think right now because nobody is building [coal] power plants right now," Winberg told Utility Dive when asked about the prospects for new U.S. coal generators. "But I think it's quite possible in the future and primarily depends on what the price of natural gas is."). Attached as Exhibit 9.

[31] *See* NREL, "Electrification Futures Study: Scenarios of Electric Technology Adoption and Power Consumption for the United States", at ix (2018), https://www.nrel.gov/docs/fy18osti/71500.pdf (stating "[c]ontinued acceleration of electric vehicle adoption in the transportation sector could dramatically increase total electricity demand"). Attached as Exhibit 10.

[32] EIA, Annual Energy Outlook 2019, at 96 (Jan. 2019), https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf. Attached as Exhibit 11.

so important. In light of this dynamic context, failing to regulate these sources at all could incentivize the construction of new coal-fired units, which would generate the emissions that section 111 of the Act is intended to reduce.

Additionally, EPA states that the forecast for building new coal-fired EGUs "raises questions about whether new coal-fired EGUs contribute significantly to atmospheric CO_2 levels."[33] However, the degree of contribution to CO_2 concentrations is not the proper analytical framework for determining whether to regulate GHG emissions from this source category. Rather, EPA correctly determined to regulate GHG emissions from new EGUs in the 2015 NSPS based on (1) the degree to which EGUs contribute to total U.S. GHG emissions[34] and (2) annual mass emissions from each power plant.[35] In turn, EPA stated that "[i]t is not necessary in this rulemaking for the EPA to decide whether it must identify a specific threshold for the amount of emissions from a source category that constitutes a significant contribution; under any reasonable threshold or definition, the emissions from combustion turbines and steam generators are a significant contribution."[36] EPA's reasoning in the 2015 NSPS remains valid and, therefore, the degree to which EGUs contribute to total GHG emissions and the mass emissions from each power plant warrant regulation under section 111.

EPA's current framing on this point (i.e., contribution to CO_2 concentrations) appears intended to attenuate specific emissions sources or categories of emissions sources from the ultimate problem of climate change because any one source of emissions contributes a limited amount to atmospheric concentrations. However, as discussed above and in the 2015 NSPS, power sector emissions are significant in their own right, and emissions reductions from all sources are needed to avoid the worst consequences of climate change, as the USGCRP and the IPCC have recently found. Therefore, EPA declining to regulate new coal-fired EGUs based on this argument would be wholly unreasonable.

In sum, it would be unreasonable for EPA to fail to regulate the largest stationary source category of GHG emissions.

II. EPA's Proposed BSER is Arbitrary and Capricious

In the 2015 NSPS, EPA recognized the significance of GHG emissions from new power plants and reasonably determined that BSER for coal-fired steam boilers is equivalent to supercritical boiler technology and the institution of partial carbon capture and sequestration

[33] Proposed Rule at 65432, note 25.
[34] 2015 NSPS at 64530.
[35] *Id.* at 64531.
[36] *Id.*

(CCS). Now, EPA proposes a BSER for coal-fired steam boilers that is essentially equivalent to how coal-fired power plants have been designed in the last few years, which has occurred in the absence of any NSPS for the GHG emissions from such plants. In other words, EPA proposes a do-nothing approach to reducing the GHG emissions from new coal-fired power plants.

As EPA knows, "the arbitrary and capricious test applie[s] to rescissions of prior agency regulations,"[37] which means that EPA's actions must be consistent with statutory structure and intent, and grounded in the evidence. The Supreme Court has stated that an agency must "provide a more detailed justification than would suffice for a new policy…when, for example, its new policy rests upon factual findings that contradict those which underlay its prior policy… It would be arbitrary and capricious to ignore such matters." *FCC v. Fox Television Stations*, 566 U.S. 502, 515-16 (2009) (internal citation omitted). Yet, in the Proposed Rule, EPA relies on factual findings that contradict, without adequate support, the 2015 NSPS.

Indeed, the 2015 NSPS has been applicable for more than five years[38] and EPA has presented no evidence that the standard has affected the viability of any potential new EGU project. At the same time, two coal-fired power plants have instituted CCS since the 2015 NSPS became applicable, demonstrating the commercial availability of CCS technology.[39] In this context, EPA has an especially high burden to reverse course and assert that its prior reasoning in the 2015 NSPS is no longer valid.

For the reasons described below, the Proposed Rule's BSER does not conform to the Clean Air Act.

a. The Proposed BSER Is Unlawful Because It Will Not Reduce Emissions

CAA section 111(b)(1)(A) requires EPA to establish a list of source categories to be regulated under CAA section 111. Once EPA lists a source category under CAA section 111(b)(1)(A), EPA then promulgates, under CAA section 111(b)(1)(B), ''standards of performance for new sources within such category.'' The term "standard of performance" means "a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost

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[37] *Motor Vehicles Mfrs. Ass'n v. State Farm Mut. Ins. Co.*, 463 U.S. 29, 44 (1983).
[38] The 2015 NSPS applies to those sources that commence construction on or after the date of publication of the proposed standards, January 8, 2014.
[39] *See* Congressional Research Service, "Carbon Capture and Sequestration (CCS) in the United States", at 12, *available at*: https://fas.org/sgp/crs/misc/R44902.pdf (stating "Globally, two fossil-fueled power plants currently generate electricity and capture CO_2 in large quantities: the Boundary Dam plant in Canada and the Petra Nova plant in Texas."). Attached as Exhibit 12.

of achieving such reduction and any nonair quality health and environmental impact and energy requirements) [EPA] determines has been adequately demonstrated."[40]

As EPA acknowledges[41], although the definition of "standard of performance" does not by its terms identify the amount of emissions from the category of sources or the amount of emission reductions achieved as factors the EPA must consider in determining the "best system of emission reduction," the D.C. Circuit has stated that EPA must in fact do so.[42] Additionally, Section 111 is technology-forcing and "looks toward what may fairly be projected for the regulatory future, rather than the state of the art at present."[43]

EPA proposes to create three subcategories of steam generating units and proposes that BSER is "the most efficient demonstrated steam cycle" with no CCS.[44] For large units, EPA proposes that BSER is supercritical steam conditions. The Proposed BSER differs from the 2015 NSPS in that the 2015 NSPS established BSER for new coal-fired steam units as supercritical technology with post-combustion partial CCS.

As an initial matter, EPA fails to recognize that the baseline against which to measure the Proposed Rule is not the "business-as-usual" expected emissions from a new coal-fired EGU absent any regulation; rather, it is the level of CO_2 such an EGU would emit under current law, which is the 2015 NSPS. *See Air All. Houston v. Envtl. Prot. Agency*, 906 F.3d 1049, 1068 (D.C. Cir. 2018) (explaining that "the baseline for measuring the impact of a change or rescission of a final rule is the requirements of the rule itself, not the world as it would have been had the rule never been promulgated"). While EPA acknowledges in its economic analysis that emissions from a new coal-fired EGU under the Proposed Rule would be much higher than emissions under the 2015 NSPS[45], EPA fails to indicate in the preamble how this increase in emissions is consistent with the BSER standard. EPA therefore lacks any rational basis to claim that its new standard is based on a system of emission reduction that is in fact "the best."

Additionally, as evidenced by EPA's miniscule estimated emissions reductions from the Proposed Rule, EPA's BSER is essentially equivalent to the status quo with no NSPS and, therefore, the BSER unlawfully does not reduce emissions compared to a scenario with no regulation at all. As the Proposed Rule states, "[i]n the 2015 Rule, the EPA found that highly

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[40] 42 U.S.C. § 7411(a)(1).
[41] *See* Proposed Rule, at 65433.
[42] *See Sierra Club* v. *Costle,* 657 F.2d 298, 326 (D.C. Cir. 1981).
[43] *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 391 (D.C. Cir. 1973).
[44] Proposed Rule at 65430.
[45] As discussed *supra*, EPA's economic analysis indicates that the Proposed Rule would result in an estimated increase of 1.1 million tons/year of CO_2 for every large (600 MW) baseload coal-fired EGU compared to the 2015 NSPS.

efficient generation did not represent BSER in part because it would not result in meaningful emission reductions and did not promote the development of control technology. That conclusion was based on the assumption that any new coal-fired EGU built in the U.S. would use highly efficient generation even in the absence of 40 CFR part 60, subpart TTTT. *Close to 90 percent of the large coal-fired EGUs that have commenced operation since 2010 in the U.S. use either supercritical steam conditions or IGCC technology.*"[46] Furthermore, EPA noted in the 2015 NSPS that a new supercritical unit firing bituminous coal would emit approximately 1,720 lb CO_2/MWh, well below the standard that EPA now proposes.[47] A section 111(b) rule that only requires—at most—what new coal-fired EGUs are doing anyway is no standard at all.

To the extent the Proposed Rule is more stringent than the status quo ante with no NSPS, it risks increasing emissions via the rebound effect. Specifically, EPA touts its proposed BSER by stating that "due to the lower variable operating costs, more efficient designs would be expected to dispatch more often and sell more electricity, thereby offsetting increases in capital costs."[48] However, while EPA does not model emissions impacts from the Proposed Rule because it does not anticipate any new coal-fired plants being built, "sell[ing] more electricity" implies greater emissions, unless the standard of performance outpaces the increase in generation. Therefore, if economic and regulatory conditions change in a way that leads to new coal-fired EGUs being constructed, the Proposed Rule could actually increase emissions over the status quo ante, to the extent that EPA asserts that its BSER is beyond what new plants would construct in the absence of the NSPS.[49] Whatever discretion EPA has, it must establish a section 111(b) rule that reduces emissions given the text and structure of section 111. Therefore, the Proposed Rule is arbitrary and capricious because it will not necessarily reduce emissions, and may increase emissions.

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[46] Proposed Rule at 65431 (emphasis added).
[47] 2015 NSPS, at 64594.
[48] *Id.* at 65447.
[49] EPA asserts that, "[a]lthough supercritical technology is already developed, establishing it as the basis for control requirements in the U.S. for new and reconstructed sources would help establish it in other nations, resulting in a reduction in global CO_2 emissions. The EPA considers that the proposed BSER will promote the development and implementation of viable control technologies." Proposed Rule at 65448. However, as EPA states in the Proposed Rule, "more efficient designs would be expected to dispatch more often and sell more electricity" (*id.* at 65447), which potentially means greater emissions. Therefore, spreading supercritical technology to other countries will not reduce global CO_2 emissions and may increase GHG emissions. Given the value of spreading innovation and scaling new technology globally, the 2015 NSPS is the only appropriate BSER for coal-fired EGUs that allows such EGUs to operate by burning coal.

b. BSER Must Account for the Purpose of Section 111 and the Endangerment Finding

The Proposed Rule is particularly inappropriate when the Act's emissions reduction requirements are read in light of EPA's factual findings regarding greenhouse gases. The facts in this case are reflected in EPA's 2009 Endangerment Finding and subsequent climate science. In the Endangerment Finding, EPA states that it "has determined that the body of scientific evidence compellingly supports this finding."[50] Specifically, EPA considered how elevated concentrations of anthropogenic GHG emissions affect public health by evaluating the evidence of the risks associated with changes in air quality, increases in temperatures, changes in extreme weather events, increases in food- and water-borne pathogens, and changes in allergens.[51] Additionally, EPA considered how elevated concentrations of GHG emissions affect public welfare by evaluating the evidence of the risks to food production and agriculture, forestry, water resources, sea level rise and coastal areas, energy, infrastructure, and settlements, and ecosystems and wildlife.[52] Significantly, the Endangerment Finding notes that "the Supreme Court did not establish a specific deadline for EPA to act"; but, "EPA has a responsibility to respond to the Supreme Court's decision and to fulfill its obligations under current law, and there is good reason to act now given the urgency of the threat of climate change and the compelling scientific evidence."[53]

Since the 2009 Endangerment Finding, the scientific consensus around climate change has only deepened and new records continue to be set for a number of climate change indicators. In the Endangerment Finding, EPA states that "[t]he major assessments by the U.S. Global Climate Research Program (USGCRP), the Intergovernmental Panel on Climate Change (IPCC), and the National Research Council (NRC) serve as the primary scientific basis

[50] Endangerment Finding, at 66497.
[51] *Id.* at 66497 (stating "[t]he evidence concerning adverse air quality impacts provides strong and clear support for an endangerment finding. Increases in ambient ozone are expected to occur over broad areas of the country, and they are expected to increase serious adverse health effects in large population areas that are and may continue to be in nonattainment. The evaluation of the potential risks associated with increases in ozone in attainment areas also supports such a finding. The impact on mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves, also provides support for a public health endangerment finding. There are uncertainties over the net health impacts of a temperature increase due to decreases in cold-related mortality, but some recent evidence suggests that the net impact on mortality is more likely to be adverse, in a context where heat is already the leading cause of weather-related deaths in the United States. The evidence concerning how human-induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods.").
[52] *Id.* at 66498.
[53] *Id.* at 66500.

supporting [EPA's] endangerment finding."[54] [55] Since 2009, these bodies have produced revised assessments that reveal in even starker contrast the severity of current and projected climate change.[56]

Projected climate change is likely to become even worse, as EPA acknowledges. The recently proposed Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule assumes that CO_2 concentrations will be approximately 789 ppm by 2100[57] and the draft environmental impact statement for the SAFE Rule indicates that this concentration corresponds with warming of 3.5°C by 2100. [58] The Proposed Rule does not suggest that other temperature change and CO_2 concentration figures should apply in the present context, so CARB assumes that these are the working assumptions of EPA.

Allowing CO_2 concentrations to reach 789 ppm—and global temperatures to increase by 3.5°C—by 2100 would spell disaster for the U.S. and the world. The USGCRP Fourth Assessment indicates that, during the last period when CO_2 concentrations were at this level (35 to 55 million years ago), there were no permanent land-based ice sheets[59] and sea level

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[54] *Id.* at 66497.
[55] *Id.* at 66511 (stating "[i]t is EPA's view that the scientific assessments of the IPCC, USGRCP, and the NRC represent the best reference materials for determining the general state of knowledge on the scientific and technical issues before the agency in making an endangerment decision. No other source of information provides such a comprehensive and in-depth analysis across such a large body of scientific studies, adheres to such a high and exacting standard of peer review, and synthesizes the resulting consensus view of a large body of scientific experts across the world. For these reasons, [EPA] is placing primary and significant weight on these assessment reports in making [its] decision on endangerment.").
[56] *See* 2015 NSPS, at 64517-18 (stating "[s]ince the administrative record concerning the Endangerment Finding closed following the EPA's 2010 Reconsideration Denial, the climate has continued to change, with new records being set for a number of climate indicators such as global average surface temperatures, Arctic sea ice retreat, CO_2 concentrations, and sea level rise. Additionally, a number of major scientific assessments have been released that improve understanding of the climate system and strengthen the case that GHGs endanger public health and welfare both for current and future generations…The EPA has carefully reviewed these recent assessments in keeping with the same approach outlined in [] the 2009 Endangerment Finding, which was to rely primarily upon the major assessments by the USGCRP, the IPCC, and the NRC of the National Academies to provide the technical and scientific information to inform [EPA's] judgment regarding the question of whether GHGs endanger public health and welfare. These assessments addressed the scientific issues that the EPA was required to examine, were comprehensive in their coverage of the GHG and climate change issues, and underwent rigorous and exacting peer review by the expert community, as well as rigorous levels of U.S. government review. The findings of the recent scientific assessments confirm and strengthen the conclusion that GHGs endanger public health, now and in the future.").
[57] Proposed Rule, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42986, 42996 (Aug. 24, 2018).
[58] Draft Environmental Impact Statement, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021–2026 Passenger Cars and Light Trucks, at 5-31 (July 2018), available at: https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld_cafe_my2021-26_deis_0.pdf.
[59] USGCRP Fourth Assessment, Vol. 1, at 141.

rise of up to 8 feet by 2100 is a possibility in such higher temperature scenarios.[60] The IPCC finds that the "risks associated with temperatures at or above 4°C include substantial species extinction, global and regional food insecurity, consequential constraints on common human activities and limited potential for adaptation in some cases."[61]

By late-century (2070-2100), California's Fourth Climate Change Assessment (California Fourth Assessment) projects temperature increases of 4 to 6 °C in the state.[62] Snowpack—a vital resource for drinking water and the State's agricultural industry—is projected to decline to less than half the historical median under one emissions scenario and less than one-third under another emissions scenario.[63] More of California's forests will burn[64], and rising seas will wipe out southern California beaches and coastal properties[65], with unabated climate change.

In short, the 2009 Endangerment Finding remains in place and the climate science since then has underlined the urgency of the climate crisis. The USGCRP found in 2018 that "[s]tabilizing global mean temperature to less than [2 °C] above preindustrial levels requires substantial reductions in net global CO_2 emissions prior to 2040 relative to present-day values and likely requires net emissions to become zero or possibly negative later in the century."[66] The IPCC recently found that, in order to limit warming to below 2 °C, global net anthropogenic CO_2 emissions would need to decline by about 20% from 2010 levels by 2030 and reach net zero by 2075.[67] The emissions reductions required to limit warming to 1.5 °C—which would still entail significant negative effects on public health and welfare[68]—are much more ambitious.[69] Yet, EPA seems to have no plan for reducing emissions consistent with these expert climate science assessments.

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[60] *Id.* at 333.
[61] *See, e.g.*, IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], at 19 (IPCC Fifth Assessment Report). Attached as Exhibit 13.
[62] California Fourth Climate Change Assessment, Statewide Summary Report, at 23 (2018). Attached as Exhibit 14.
[63] *Id.* at 27.
[64] *Id.* at 30.
[65] *Id.* at 31-33.
[66] USGCRP Fourth Assessment, Vol. 1, at 393.
[67] IPCC 1.5 °C Report, at SPM-15.
[68] *Id.* at SPM-11 (stating "Climate-related risks to health, livelihoods, food security, water supply, human security, and economic growth are projected to increase with global warming of 1.5°C and increase further with 2°C.").
[69] *Id.* (stating that emissions would need to decline to 45% below 2010 levels by 2030 and be net zero by 2045 to prevent warming from exceeding 1.5 °C). As the IPCC states, "[p]athways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems… These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in

After a "searching and careful inquiry" into the facts,[70] courts will find EPA's actions arbitrary and capricious if the agency has failed to "examine the relevant data and articulate a satisfactory explanation for its action, including a rational connection between the facts found and the choice made,"[71] or has reached a conclusion unsupported by substantial evidence.[72]

In this case, there is no rational connection between the facts found and the choice made. It is wholly unreasonable for EPA to propose a section 111(b) rule for one of the largest sources of GHG emissions that essentially does nothing to reduce emissions and address the threat of climate change. In sum, EPA has failed to articulate a rational connection between the facts found (i.e., climate change is caused by GHG emissions and affects public health and welfare, per the Endangerment Finding) and the choice made (i.e., the Proposed Rule's BSER). Therefore, the Proposed Rule is arbitrary and capricious.

c. EPA's Rejection of Partial CCS as BSER is Unreasonable

Beyond the fact that EPA's BSER is arbitrary and capricious for failing to reduce emissions, especially in light of the Endangerment Finding and the climate crisis, EPA's specific rationale for rejecting CCS is unreasonable. EPA reverses course on including CCS in BSER because EPA purports that (1) its operating cost analysis in the 2015 NSPS was incorrect and (2) its assumptions regarding the geographic availability of geologic sequestration (GS) have changed. As indicated previously, EPA must "provide a more detailed justification than would suffice for a new policy…when, for example, its new policy rests upon factual findings that contradict those which underlay its prior policy."[73] EPA's new policy contradicts the factual findings in the 2015 NSPS and is unsupported; therefore, it is arbitrary and capricious.

i. EPA's Cost Assumptions Are Incorrect

Regarding operating costs, EPA now argues that it did not accurately consider the Levelized Cost of Electricity (LCOE) in assessing whether partial CCS was BSER in the 2015 NSPS. In the 2015 NSPS, EPA considered the reasonableness of costs by, among other things, evaluating the LCOE associated with the final standard, as compared to other dispatchable base load power that provides fuel diversity by relying on a fuel source other than natural

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all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options." *Id.* at SPM-21.

[70] *Am. Trucking Ass'n v. EPA,* 283 F.3d 355, 362 (D.C. Cir. 2002).

[71] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.,* 463 U.S. 29, 43 (1983) (internal quotation marks and citation omitted).

[72] *Ass'n of Data Processing Serv. Orgs., Inc. v. Bd. of Governors of the Fed. Reserve Sys.,* 745 F.2d 677, 683–84 (D.C. Cir. 1984).

[73] *FCC v. Fox Television Stations,* 566 U.S. 502, 515-16 (2009).

gas.[74] Now, EPA proposes to adjust CO_2 transmission and storage (T&S) costs and EGU capacity factors with respect to its LCOE estimates: "EPA is proposing to adjust the T&S costs based on the amount of CO_2 captured and adjust the capacity factor based on the increase in variable operating costs due to the impact of partial CCS. Accounting for these factors revises the LCOE with partial CCS upwards."[75] EPA uses the best fit trendline to estimate the T&S costs for various amounts of CO_2 capture.[76] EPA asserts that greater T&S costs increase the LCOE and, in electricity markets with economic dispatch, would lead to new units being dispatched less. In EPA's view, this means CCS is not BSER because it would decrease the payments that new units receive for dispatch and is, therefore, too costly.

However, EPA's approach is unsupported. As EPA found in the 2015 NSPS, given current and projected market conditions, any new coal-fired EGU would likely only be built in a location where it would be expected to operate at a high capacity factor (e.g., as a base load unit), which militates against including the impact of economic dispatch in determining the costs of a potential new coal-fired EGU.[77] Nothing in the Proposed Rule contradicts the 2015 NSPS in this regard, or otherwise supports the argument that a new coal-fired power plant would be constructed to compete in electricity markets based on price.

EPA's sole basis for even considering a reevaluation of its assumptions about capacity factors is its unsupported assertion that "an increasing number of coal-fired power plants are changing from base load to variable load."[78] EPA cites no evidence for that claim. However, even if it were true, EPA is only describing the behavior of operators of *existing* power plants in response to market conditions. EPA does not provide support for the claim that a developer of *new* generating capacity would build a coal-fired plant to operate as a variable load source instead of as a base load source with a high capacity factor.[79] Therefore, EPA's newfound assumptions regarding the LCOE and capacity factor for new coal-fired EGUs are arbitrary.

If EPA does revise its analysis of the cost of employing partial CCS at a new coal-fired plant, it should take into account opportunities for the plant operator to offset that cost. Most notably, EPA explicitly does *not* factor economic incentives and potential revenue sources

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[74] 2015 NSPS, at 64560-62.
[75] Proposed Rule at 65437.
[76] *Id.* at 65438.
[77] *See id.* at 65438.
[78] *Id.* at 65438-39.
[79] Indeed, EPA presents no evidence that the stringency of the 2015 NSPS, which has been applicable for more than five years, and potential impacts on the LCOE have actually affected the viability of any potential new coal EGU project.

into its cost analysis.[80] Internal Revenue Code § 45Q was recently amended[81] to provide significant financial incentives to GS and sequestration through beneficial uses. CO_2 used for saline storage receives $50 per tonne of CO_2 stored while utilization in products, including enhanced oil recovery (EOR), receives $35 per tonne of CO_2.[82] Given that the tax credit values are greater than every point on EPA's trendline of estimated T&S costs, it would be unreasonable to base EPA's reassessment of whether CCS is BSER on such T&S costs without considering section 45Q tax incentives.

Additionally, plants that produce high purity CO_2 can market the CO_2 for EOR and other market uses (e.g., the food industry). EPA's failure to consider the market value of CO_2 is also unreasonable in this context. When considering the value of section 45Q tax incentives and commercial revenue sources, it is clear that the conclusion in the 2015 NSPS that CCS entails reasonable costs remains valid, even in light of EPA's new unsupported assumptions that increase the cost of CCS.[83] [84]

ii. EPA's CCS Geographical Availability Argument is Unsupported

EPA also asserts that CCS is not adequately demonstrated based on EPA's newfound view that CCS is less geographically available than what EPA determined in the 2015 NSPS. Specifically, in the 2015 NSPS, EPA performed a geographic analysis and determined that "geologic sequestration and EOR capacity are widely available and accessible."[85] EPA also found the 1,400 lb CO_2/MWH-g standard to be BSER "because alternative compliance

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[80] Proposed Rule at 65440.
[81] *See* Bipartisan Budget Act of 2018, Pub. Law 115-123.
[82] The previous version of Section 45Q provided smaller credits (up to $20/ ton) to more limited uses. The tax credits last for up to 12 years for projects that commence construction before 2024.
[83] *See, e.g.,* Clean Air Task Force and Natural Resources Defense Council Letter on CCS, at 17 (Oct. 31, 2018) ("The economics of CCS are project specific and determined on a case-by-case basis through detailed analysis. In general, the costs of CO_2 capture and transport must be lower than the revenue a CO_2 source receives from the sale of CO_2 for EOR and the value of 45Q tax credits. These costs and revenues and can be illustrated with some general, high-level numbers. The cost of transporting CO_2 is a relatively small cost. A DOE/NETL study examined transportation from plants to storage basins estimated transport costs to be $3.65 per tonne. If capture costs are around $45/tonne, then project costs would be approximately $50 per tonne. To be economic in this illustration, revenue must exceed this $50 per tonne cost. The value of 45Q tax credits is $35 per tonne, leaving EOR revenue to pay for the remaining $15 per tonne cost. While EOR revenue varies based on oil price and operator, typical values for EOR revenue can range from $15 per tonne to $30 per tonne."). Attached as Exhibit 15.
[84] In several cases, the Court upheld standards that entailed significant costs, consistent with Congress's view that ''the costs of applying best practicable control technology be considered by the owner of a large new source of pollution as a normal and proper expense of doing business.'' *See Essex Chemical Corp. v. Ruckelshaus*, 486 F.2d 427, 440 (D.C. Cir. 1973); *Portland Cement Association v. Ruckelshaus*, 486 F.2d 375, 387–88 (D.C. Cir. 1973); *Sierra Club v. Costle*, 657 F.2d 298, 313 (D.C. Cir. 1981).
[85] 2015 NSPS, at 64597.

pathways are available in the unusual circumstance where a new coal-fired plant is sited in an area without such [GS or EOR] access, that area has not already limited construction of new coal-fired capacity in some way, and the area cannot be serviced by coal-by-wire."[86]

EPA now claims that its new assumptions regarding water availability for CCS and availability of geologic sequestration justify abandoning CCS as BSER wholesale. Specifically, EPA argues—as opposed to the 2015 NSPS—that unmineable coal seams have not been shown to be a suitable GS resource.[87] By excluding unmineable coal seams from potential GS areas, the geographic availability of GS decreases by about 4 percent. Additionally, EPA now argues that many sequestration sites might have insufficient water resources to operate CCS equipment because the Western U.S., excluding the Pacific Northwest, has lower annual average rainfall totals than the rest of the U.S.[88] EPA concludes that the geographic availability of CCS is too limited to be considered BSER.

EPA's argument is unsupported. Regarding the exclusion of unmineable coal seams for GS, this only results in a 4 percent reduction in the geographic availability of GS. EPA includes no analysis regarding how this would affect the overall availability of GS for new EGUs (e.g., there is no analysis of the distance to the next available GS site throughout the U.S. as a result of excluding unmineable coal seams from the geographic availability analysis). According to the U.S. Geological Survey (USGS), "North America has widespread geologic storage options in deep porous saline formations and in depleted oil fields."[89] Additionally, the National Energy Technology Laboratory found that 84 percent of coal-fired plants are within 25 miles of a sequestration site.[90] Moreover, EPA found in the 2015 NSPS that, due to the interconnected nature of the electric grid, a new coal-fired plant could be built closer to an area with geological storage capacity and supply electricity to areas that do not have that capacity.[91]

Additionally, EPA's argument about the sufficiency of water resources to operate CCS equipment relies on pure assertion. EPA proposes to determine that CCS is unavailable in the Western U.S. based on annual average rainfall totals. It is unclear what degree of granularity EPA employed to determine that annual average rainfall totals were too low to support CCS in the Western U.S. To the extent that EPA is relying on state-level rainfall totals or a generalized assertion about rainfall totals in the Western U.S., EPA's conclusion

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[86] *Id.*
[87] *See* Proposed Rule, at 65442.
[88] *Id.* at 65444.
[89] See USGS, "National Assessment of Geologic Carbon Dioxide Storage Resources—Summary" (Sep. 2013). Attached as Exhibit 16.
[90] U.S. Department of Energy, National Energy Technology Laboratory, "Coal-fired Power Plants in the U.S.: Examinations of the Costs of Retrofitting with CO2 Capture Technologies" (Jan. 2011). Attached as Exhibit 17.
[91] 2015 NSPS, at 64541.

would be unsupportable. Such an approach fails to consider the availability of water in relation to potential sites for new EGUs and vis-à-vis GS and EOR sites. Moreover, EPA was well aware that CCS required water and that some areas of the country have less water resources available than others, but it nevertheless concluded that partial CCS was reasonably available throughout the United States and was BSER in the 2015 NSPS.

Finally, even if there were evidence supporting the exclusion of unminable coal seams or the insufficiency of water resources to operate CCS equipment, such evidence would not justify abandoning the 2015 NSPS BSER wholesale. Rather, EPA may subcategorize the NSPS based on geography. For instance, most coal-fired EGUs are in the Eastern U.S., where water resources are typically abundant and, therefore, CCS remains available. If EPA's assertions about geographic availability were correct (which CARB disputes), then the proper response would be for EPA to subcategorize the NSPS based on geography. Therefore, it would be arbitrary to rollback the EGU BSER for the entire U.S. based on EPA's unsupported assertions about how CCS may be unavailable in certain parts of the U.S.

Therefore, EPA has not articulated "a satisfactory explanation for its action, including a rational connection between the facts found and the choice made."[92] EPA's analysis on the availability of CCS is arbitrary and capricious.[93]

d. If EPA Revises the 2015 NSPS, It Must Revise Its Cost and Technology Assumptions

CARB supports retaining the 2015 NSPS because it reflects BSER when EPA promulgated the rule. However, to the extent EPA revises the 2015 NSPS at all, it must all re-review the assumptions undergirding the BSER generally. Lower cost and greater availability of new energy technology support a more stringent BSER if anything, not a less stringent standard. Therefore, to the extent EPA reconsiders the 2015 NSPS at all, EPA should revise its cost and technology assumptions.

In the 2015 NSPS, EPA combined the steam generator and combustion turbine categories into a single category of fossil fuel-fired electricity generating units for purposes of promulgating standards of performance for GHG emissions. As EPA stated at that time, "[c]ombining the two categories is reasonable because they both provide the same product:

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[92] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (internal quotation marks and citation omitted).

[93] Regardless of the validity of EPA's geographic availability argument, EPA correctly found that the 2015 NSPS "can be achieved by new steam generating EGUs—including new utility boilers and IGCC units—through cofiring with natural gas in lieu of installing partial CCS, which moots the issue of the geographic availability of geologic sequestration." 2015 NSPS, at 64541.

Electricity services."[94] Additionally, EPA indicated that new steam generating EGUs—including new utility boilers and IGCC units—could comply with the NSPS through co-firing with natural gas in lieu of installing partial CCS. In light of the structure of the Act and the 2015 NSPS, EPA can broadly consider appropriate technology that reduces emissions for a source category.

In this sense, BSER is unlike Best Available Control Technology (BACT), where long-standing policy prohibits "redefining the source" for BACT purposes (i.e., requiring a major modification to a coal-fired EGU to burn natural gas instead). As EPA stated in the Clean Power Plan response to comments document, ''EPA's policies under CAA section 165 regarding the construction of individual sources are not controlling for purposes of establishing category-wide standards for existing sources under CAA section 111(d)."[95] Section 165 specifically addresses preconstruction permitting for new major stationary sources and major modifications to existing stationary sources. The BACT analysis for such permitting is necessarily source-specific and prescriptive.

On the other hand, Section 111's system-level inquiry into an entire source category (here, the entire cohort of fossil fuel-fired power plants) directs a category-level consideration. In light of the climate crisis and recent technological developments, the 2015 NSPS BSER (supercritical boilers with partial CCS) should not be reconsidered at this time. To the extent EPA revises the 2015 NSPS, EPA should be considering a BSER that is more stringent.[96]

III. CONCLUSION

The Proposed Rule is arbitrary and capricious. EPA should withdraw the Proposed Rule and conclude the ongoing litigation regarding the 2015 NSPS.

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[94] 2015 NSPS at 64531.
[95] *See* EPA, Clean Power Plan Responses to Comments Document, Chapter 1A, at 172. Attached as Exhibit 18.
[96] EPA "is not proposing to amend and is not reopening the standards of performance for newly constructed or reconstructed stationary combustion turbines." Proposed Rule at 65427. Nevertheless, to the extent that EPA reassesses the NSPS for new coal-fired power plants at all, EPA should consider how to reduce emissions from the power sector as a whole. Assessing the potential for additional emissions reductions from the power sector may lead to additional cost effective emissions reductions from NGCC units.

Exhibits

1. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, "Indicators of Climate Change in California" (2018), available at: https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf.
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4. IPCC, Summary for Policymakers, *Global Warming of 1.5 °C* (2018), available at: http://www.ipcc.ch/report/sr15/.
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12. Congressional Research Service, "Carbon Capture and Sequestration (CCS) in the United States", *available at*: https://fas.org/sgp/crs/misc/R44902.pdf.
13. IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)].
14. California Fourth Climate Change Assessment, Statewide Summary Report (2018).
15. Clean Air Task Force and Natural Resources Defense Council Letter on CCS (Oct. 31, 2018).

16. USGS, "National Assessment of Geologic Carbon Dioxide Storage Resources—Summary" (Sep. 2013).
17. U.S. Department of Energy, National Energy Technology Laboratory, "Coal-fired Power Plants in the U.S.: Examinations of the Costs of Retrofitting with CO2 Capture Technologies" (Jan. 2011).
18. EPA, Clean Power Plan Responses to Comments Document, Chapter 1A.