

April 26, 2018

Comments submitted by free market groups on EPA's proposed rule to repeal the Clean Power Plan

Docket ID No. EPA-HQ-OAR-2017-0355

Via electronic delivery to <http://www.regulations.gov>

Thank you for the opportunity to comment on the Environmental Protection Agency's (EPA) proposed rule¹ to repeal the Obama administration's carbon dioxide (CO₂) emission standards for existing fossil-fuel power plants, commonly referred to as the Clean Power Plan (CPP).²

We strongly support repeal of the CPP based on EPA's reading of the Clean Air Act (CAA). This action is critical to end the previous administration's economically destructive war on fossil fuels and deter future attempts to inflate EPA into a national climate policy legislator and energy czar.

We comment on each part of EPA's legal argument and offer additional statutory reasons to repeal the CPP. We also comment on EPA's revisions to the CPP Regulatory Impact Analysis (RIA) and offer additional reasons to challenge that document's climate and health benefit estimates.

This joint comment letter is organized as follows. Part I is an executive summary. Part II describes several basic features of the CPP. Part III comments on EPA's proposed interpretation of CAA section 111(d) and legal argument for repeal. Part IV offers additional statutory reasons to repeal the CPP. Part V comments on EPA's "broader policy concerns" regarding the CPP. Part VI comments on the "avoided compliance costs, forgone benefits, modeling assumptions, uncertainties, and other relevant matters" discussed in the repeal proposal's draft RIA. Part VII states our conclusions.

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Part I: Executive Summary

The Clean Power Plan was President Obama's marquee domestic climate policy and regulatory centerpiece of his Paris climate treaty emission-reduction pledge. Unable to persuade Congress to enact cap-and-trade legislation, Obama vowed to find other ways to "skin the cat," and directed EPA to regulate CO₂ emissions from the U.S. power sector. The CPP was the result. It is unlawful for all the reasons outlined in the repeal proposal plus others described herein.

¹ EPA, Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Proposed rule, 82 FR 48035-48049, October 16, 2017, <https://www.gpo.gov/fdsys/pkg/FR-2017-10-16/pdf/2017-22349.pdf>

² EPA, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule, October 23, 2015, 80 FR 64662-64964, <https://www.gpo.gov/fdsys/pkg/FR-2015-10-23/pdf/2015-22842.pdf>

Under CAA section 111, emission performance standards are to reflect the “best system of emission reduction” (BSER) that has been “adequately demonstrated” as feasible and affordable. Such “systems” are designed for and apply to “sources,” so the legal meaning of “system” depends on that of “source.” A “source” is defined as “any building, structure, facility, or installation which emits or may emit air pollutants.” Consequently, a bona fide BSER must be based on measures that can be applied at and by the source.

The Obama administration refused to accept that limitation because there is no “adequately demonstrated” best system for reducing CO₂ emissions from existing power plants. The closest facsimile would be equipment upgrades that improve operational efficiency. However, increasing the efficiency of fossil-fuel power plants would not advance Obama’s goal to “finally make renewable energy the profitable kind of energy in America.”

So, EPA came up with a plan to impose unattainable emission performance standards on existing fossil fuel power plants. To comply, owners and operators must purchase power from, invest in, or cede market share to lower- and zero-emission facilities elsewhere on the grid. Such “generation shifting” is the heart of BSER under the CPP.

To make it look legal, the CPP reimagines “source” to include power plant owners and operators in their capacity as marketplace actors. More fundamentally, the CPP imagines the entire U.S. electricity system to be a single source—a vast “machine” in which individual power plants are mere cogs.

As the repeal proposal argues, generation shifting is an unlawful BSER because owners and operators are not “sources,” and, as we explain, neither are economic sectors. We debunk the CPP’s non-sequitur argument that generation shifting is a lawful BSER because the Obama EPA considers it an efficient climate policy. We show that Congress’s authorization of generation shifting in CAA Title IV actually cuts against the CPP, because section 111 contains none of Title IV’s generation-shifting terminology. We explain how the CPP’s novel BSER produces four illogical outcomes, such as imposing tougher emission standards on existing power plants than the corresponding new source rule imposes on new sources.

We conclude, however, that the CPP would still be unlawful even if it were based on measures that can be applied at and by individual sources. As the agency’s 1975 implementing rule explains, Congress intended for CAA section 111(d) to address air pollutants with “highly localized” effects from sources that are not “numerous or diverse.” Carbon dioxide emissions have the opposite characteristics. The CO₂ greenhouse effect is global, not local, and CO₂ is emitted by both numerous and diverse sources. Carbon dioxide and CAA section 111(d) are a complete mismatch.

In addition, BSER in all previous CAA section 111 rules was based on specific emission-control technologies. There is no adequately demonstrated best system for reducing CO₂ emissions from existing power plants. Absent a bona fide BSER, section 111(d) may not be used to regulate CO₂ emissions from those facilities.

The CPP is also unlawful because it lacks a valid prerequisite CAA section 111(b) new source rule. The Obama EPA determined that “partial” carbon capture and storage (CCS) is the adequately demonstrated BSER for new coal power plants. However, CCS is not adequately demonstrated because it is too costly, too subsidy-dependent, and not even plausibly economical unless paired with enhanced oil recovery operations, which are geologically-limited to specific regions.

Most importantly, CAA section 111(d) excludes from its regulatory purview “any air pollutant . . . emitted from a source category regulated under CAA section 112.” Coal power plants have been so regulated since 2012, and natural gas combustion turbines since 2004. The CPP is unlawful under the very provision that purportedly authorizes it. Any CPP replacement rule would be unlawful for the same reason.

Turning to the repeal rule’s broader policy concerns, the CPP’s regulation of *intrastate* electricity markets not only invades a traditional zone of state responsibility, it also undermines the *interstate* policy competition that safeguards economic and political liberty. By cartelizing state energy policies along the lines of the California Global Warming Solutions Act and the Regional Greenhouse Gas Initiative, the CPP restricts citizens and firms’ ability to “vote with their feet” for pro-growth energy policies. Repealing the CPP will help restore choice and competition in energy policy, which in turn will help preserve choice and competition in American politics.

The CPP would implement a policy shift of immense economic and political magnitude without clear congressional authorization. When Congress last amended CAA section 111(d) in 1990, it also considered and rejected proposals to authorize regulatory climate policies. The 111th Congress declined to pass cap-and-trade legislation even though everyone agreed it would be more efficient, more predictable, and more sensitive to regional interests than an EPA-run regulatory program. In 2015, the House and Senate passed resolutions of disapproval to overturn the CPP. The CPP was a climate coup in which an administrative agency usurped legislative power.

Turning to the repeal proposal’s draft Regulatory Impact Analysis (RIA), we applaud EPA’s decision to use appropriate discount rates in regulatory analysis, and to compare domestic climate benefits to compliance costs when calculating CPP benefit-cost ratios. However, the draft RIA’s social cost of carbon dioxide (SC-CO₂) analysis still uses an outdated 2007 study that likely overestimates climate sensitivity (the amount of warming from a doubling of atmospheric CO₂ concentration), and still relies on two structurally-biased models that lack significant CO₂-fertilization benefits.

The final RIA should make the case that physical and economic uncertainties render quantification of CO₂-reduction benefits illusory and misleading. If courts refuse to defer to the agency’s expertise, EPA should draw the line at providing a range of SC-CO₂ values based on plausible alternative assumptions. Under some reasonable assumptions, the SC-CO₂ is negative, which implies CO₂ emissions produce net benefits.

We also applaud EPA's decision to estimate the collateral benefits of CPP-induced reductions in fine particulate matter (PM_{2.5}) using two "cutpoints" below which health risks are too uncertain to quantify. The Obama EPA's linear-no-threshold (LNT) assumption that PM_{2.5} kills at any concentration above zero is non-validated, contrary to considerable evidence, and a license for regulatory excess.

When the draft RIA sets the cutpoint at the current national ambient air quality standard (12 µg/m³), CPP-related PM_{2.5} "co-benefits" decline from between \$22.6 billion and \$44.9 billion in 2030 to between \$4.0 billion and \$7.3 billion. The compliance costs avoided by repealing the CPP then exceed foregone health benefits by \$7.1 billion to \$10.4 billion.

In light of more than 20 studies that find no significant association between PM_{2.5} exposure and mortality, including a recent analysis of 2 million deaths in eight California air basins over a 13-year period, EPA should not assume PM_{2.5} currently causes any premature mortality in the United States. If courts refuse to defer to the agency's expertise, EPA should estimate PM_{2.5} co-benefits under an additional cutpoint: 15 µg/m³, the NAAQS promulgated in 1997 and renewed in 2006.

Part II: CPP Basics

CAA Section 111

The CPP is one of two major rules issued by the Obama EPA under CAA section 111 to control CO₂ emissions from fossil fuel power plants. CAA section 111(b) requires EPA to list categories of stationary sources of air pollution that may reasonably be anticipated to endanger public health or welfare, and to establish emission performance standards for "new" (i.e. future) sources in those categories. Such standards are called new source performance standards (NSPS).

CAA section 111(d) requires EPA, subject to certain exceptions,³ to prescribe regulations (called "guidelines") under which each state must submit a plan to establish performance standards for "existing" (i.e. already built) sources in categories EPA regulates under CAA section 111(b). Such state standards are called existing source performance standards (ESPS). State plans must also provide for implementation and enforcement of the standards. If a state lacks an EPA-approved plan, EPA must prescribe a federal plan for the state.

Performance standards, whether for new or existing sources, are to reflect "the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) has been adequately demonstrated."⁴ The phrase "adequately demonstrated" roughly means *feasible* ("achievable") and *affordable* (taking "cost" into account).

³ CAA section 111(d) excludes from its regulatory purview any air pollutant regulated under the national ambient air quality standards (NAAQS) program (CAA sections 108-110) or emitted from a source category regulated under the hazardous air pollutant (HAP) program (CAA section 112).

⁴ CAA section 111(a)

Proposed and Final CPP: Differences

EPA's proposed CPP rule, published in June 2014, defined BSER for existing fossil fuel electric generating units (EGUs) as a combination of four "building block" strategies: (1) improve the thermal efficiency ("heat rate") of coal power plants,⁵ (2) substitute lower-carbon (gas-fired) generation for higher-carbon (coal-fired) generation, (3) substitute non-emitting generation (renewables and nuclear power) for fossil-fuel generation, and (4) reduce consumer demand for electric power.⁶

EPA proposed to establish rate-based emission performance goals, expressed as lbs. CO₂/MWh, for each state except Vermont, which has no fossil fuel power plants. Each state's implementation plan must be "at least as stringent as necessary to achieve" the state's performance goal.⁷ EPA calculated the goals by first estimating each state's baseline emissions, generation, and emission rate in 2012, and then estimating how much the four building block strategies could lower the state's emission rates during a 2020-2030 compliance period.⁸ EPA estimated the CPP would reduce U.S. power-sector CO₂ emissions 30 percent below 2005 levels by 2030.⁹

The final CPP, published in October 2015, made several changes to the proposed rule,¹⁰ of which four are relevant here.

- The CPP compliance period begins in 2022 rather than 2020.
- The final CPP drops the fourth building block, demand reduction, as a basis for determining BSER and, thus, for establishing emission performance goals. EPA may have made this change partly to blunt criticism that the CPP encroaches on states' authority over retail electricity sales.¹¹ Nonetheless, the final CPP

⁵ "An EGU's heat rate is the amount of energy input, measured in British thermal units (Btu), required to generate one kilowatt hour (kWh) of electricity. The more efficiently an EGU operates, the lower its heat rate will be. As a result, an EGU with a lower heat rate will consume less fuel per kWh generated and emit lower amounts of GHG and other air pollutants per kWh generated as compared to a less efficient unit." EPA, State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, Advance notice of proposed rulemaking, 82 FR 61513, December 28, 2017, <https://www.gpo.gov/fdsys/pkg/FR-2017-12-28/pdf/2017-27793.pdf>

⁶ EPA, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Proposed Rule, 79 FR 34835ff, June 17, 2014, <https://www.gpo.gov/fdsys/pkg/FR-2014-06-18/pdf/2014-13726.pdf>

⁷ 79 FR 34891

⁸ 79 FR 34837; EPA, Technical Support Document (TSD) for the CAA Section 111(d) Emission Guidelines for Existing Power Plants Docket ID No. EPA-HQ-OAR-2013-0602 Goal Computation Technical Support Document, June 2014, <https://archive.epa.gov/epa/sites/production/files/2014-06/documents/20140602tsd-goal-computation.pdf>

⁹ 79 FR 34832

¹⁰ 80 FR 64673

¹¹ The Federal Power Act limits the Federal Energy Regulatory Commission's (FERC) authority to electricity transmissions and sales "not subject to regulation by the states" (16 U.S.C. 823). It thus seems highly unlikely Congress would have given an environmental agency authority over intrastate electricity sales. See William Yeatman, "How EPA's Impending Climate Plan Conflicts with Congressional Intent as Evidenced by the Federal Power Act," GlobalWarming.Org, May 28, 2014, <http://www.globalwarming.org/2014/05/28/how-epas-impending-climate-plan-conflicts-with-congressional-intent-as-evidenced-by-the-federal-power-act/>

encourages states to use demand-side energy-efficiency programs among other “grid level” policies to meet their emission performance goals.¹²

- The final CPP includes a “Clean Energy Incentive Program” (CEIP) awarding “early action” credits for investment in both renewable energy and demand-side energy efficiency projects that begin commercial operation before the 2022-2030 compliance period.¹³ EPA adopted the CEIP without adequate opportunity for public comment, and never clarified its statutory basis.¹⁴
- EPA replaced the proposed rule’s state-specific BSER determinations with “uniform” (nationwide) source-specific BSER determinations for coal power plants and NGCC power plants.

The CPP offers several reasons for the last-mentioned change, of which the most pertinent for our purposes is the following:

Some stakeholders commented that the proposal’s approach of expressing the BSER in terms of state-specific goals deviated from the requirements of CAA section 111 and from previous new source performance standards (NSPS). The effect, they stated, was that the proposal created de facto emission standards for all affected EGUs [electric generating units] but that these de facto standards varied widely depending on the state in which a given EGU happened to be located. Instead, these and other commenters stated, section 111 requires that EPA establish the BSER specifically for affected sources, rather than by means of merely setting state-specific goals, and that these standards be uniform.¹⁵

In other words, previous CAA section 111 BSER determinations established performance standards or goals for specific categories of new or existing sources. In contrast, the proposed CPP would establish separate rate-based goals for each state. In effect, the proposed CPP treated each state’s power sector as if it were a stationary source. However, CAA section 111(a) defines source as “any building, structure, facility, or installation which emits or may emit any air pollutants.” A power sector is clearly not any such individual unit but a market process encompassing various sources, non-sources (non-emitting electric generating units), and consumers who do not produce power.

¹² 80 FR 64673, 68743

¹³ 80 FR 64829-648332. See also EPA, Clean Energy Incentive Program Design Details; Proposed rule, 81 FR 42940-42982, June 30, 2016, <https://www.gpo.gov/fdsys/pkg/FR-2016-06-30/pdf/2016-15000.pdf>

¹⁴ Statutory analysis, legislative history, and regulatory history compel the conclusion that CAA section 111 provides no authority for an early action credit program. See Marlo Lewis, Competitive Enterprise Institute, comment letter on Clean Energy Design Details; Proposed Rule, Docket ID No. EPA-HQ-OAR-2016-0033, November 1, 2016, <https://cei.org/content/comments-epa-clean-energy-incentive-program>

¹⁵ 80 FR 64674

To mitigate the CPP's legal vulnerability, the final rule establishes rate-based emission performance goals for coal and NGCC power plants, and from those numbers derives each state's interim (2022-2029) and final (2030) emission goals.

EPA's process for determining emission rate goals may be summarized as follows.¹⁶ First, EPA estimates the coal and NGCC emission rates that can be achieved (supposedly at reasonable cost) in each large regional interconnection—Eastern, Western, and Texas—by increasing coal power plant efficiency (Building Block 1), substituting gas for coal generation (Building Block 2), and substituting renewable for fossil generation (Building Block 3). EPA then selects the least stringent regional rate as the nationwide emission performance goal for each of the two subcategories of fossil fuel power plants. The Eastern Interconnection has the least stringent rate for coal power plants during all years of the compliance period (2022-2030) and the least stringent rate for NGCC power plants during 2027-2030.¹⁷

Thus, in 2030, the final year of the compliance period, the building blocks achieve the least stringent emission rates in the Eastern Interconnection. Those rates are 1,305 lbs. CO₂/MWh for coal power plants and 771 lbs. CO₂/MWh for NGCC power plants. Accordingly, those are the nationwide CPP emission performance rates for coal and NGCC power plants in 2030.¹⁸

To compute state goals, the final CPP calculates the weighted average of the source category rates based on each state's baseline generation mix. For example, in the 2012 baseline year, 48.65 percent of Arizona's fossil generation came from coal and 51.35 percent from NGCC. Thus, Arizona's State Goal in 2030 = (48.65% × 1,305) + (51.35% × 771) = 1,031 lbs. CO₂/MWh.¹⁹

Amazingly, although legal concerns impelled EPA to switch from state-specific to source-specific rates and base BSER on three rather than four building blocks, the only change in overall result was to make the CPP more stringent. Whereas the proposed CPP would achieve national power-sector emission reductions of 30 percent below 2005 levels by 2030, the final CPP would achieve reductions of 32 percent.²⁰

Proposed and Final CPP: Common Features

¹⁶ EPA, Technical Support Document (TSD) for the CAA Section 111(d) Emission Guidelines for Existing Power Plants Docket ID No. EPA-HQ-OAR-2013-0602 CO₂ Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule, August 2015, <https://archive.epa.gov/epa/sites/production/files/2015-11/documents/tsd-cpp-emission-performance-rate-goal-computation.pdf>

¹⁷ The Texas Interconnection has the least stringent rates for NGCC power plants during 2022-2026. 80 FR 64730

¹⁸ 80 FR 64667

¹⁹ EPA, TSD, Computation of Emission Performance Rate and Goal Computation, 2015, p. 20

²⁰ 80 FR 64679

Due to the revised method of computing emission rates and state goals, some states have more stringent goals in the final than the proposed CPP, and some less.²¹ However, four key features of the proposed and final CPP remain the same.

First, states' "rate-based" performance goals are easily converted into "mass-based" goals—i.e. the tonnage targets or "caps" characteristic of cap-and-trade programs.²² Second, both the proposed and final CPP encourage states to participate in multi-state emission trading programs.²³ Third, even though final CPP performance rates are source-specific rather than state-specific, the rule still effectively regulates emissions as if each state power sector—in fact, the entire U.S. electricity marketplace—were a single source (as explained below). Fourth, the final CPP continues to set performance rates no existing coal or NGCC power plant can achieve. Indeed, CPP performance rates for existing coal and NGCC power plants—1,305 lbs. CO₂/MWh and 771 lbs. CO₂/MWh, respectively—exceed the performance capabilities of most new facilities. New highly efficient supercritical pulverized coal units using bituminous coal emit nearly 1,720 lbs. CO₂/MWh²⁴ and new NGCC units on average emit 895 lbs. CO₂/MWh.²⁵

The effect of imposing unattainable standards on coal and NGCC power plants is to compel owners and operators, in their capacity as economic decision-makers, to reduce the *average* emission rate of electric power produced in their state or the nation as a whole. Options for compliance include purchasing power from lower-emitting generators, investing in lower- and zero-emission new generation, buying emission credits (which creates incentives for other actors to over-comply), or simply producing less power (which cedes market share to lower- or non-emitting facilities).²⁶

As indicated above, the CPP expects states to promote such actions via grid-level policies such as cap-and-trade, dispatch protocols prioritizing gas over coal generation, renewable electricity quota, and demand reduction programs.

²¹ State goals in the proposed CPP are at 79 FR 34957-34958. State goals in the final CPP are at 80 FR 64961-64962.

²² 79 FR 34851, 34887, 34891-34898; EPA, TSD, Computation of Emission Performance Rate and Goal Computation, 2015, pp. 20-25

²³ The proposed CPP estimates that a "regional compliance approach" (multi-state emissions trading) would lower CPP compliance costs in 2030 from \$7.5 billion to \$5.5 billion (79 FR 34839-43840), repeatedly mentions that states are allowed to convert their rate-based into mass-based goals, and explains the conversion methodology in an accompanying Technical Support Document (79 FR 34892). The final CPP is even more boosterish about cap-and-trade. It publishes states' mass-based goals "so that states can move quickly to establish mass-based programs such that their affected EGUs readily qualify to trade with affected EGUs in states that adopt the same approach" (80 FR 64962-64963, 64675). It also describes mass-based trading as the most efficient and flexible emission-reduction strategy (80 FR 64726, 64835).

²⁴ 80 FR 64594

²⁵ 80 FR 64618

²⁶ 80 FR 64796-97, 64804-06. By "non-emitting," the CPP means primarily wind and solar power. However, from the CPP's grid-wide perspective, intermittent renewables like wind and solar power are emitting facilities because they depend on fossil-fuel generation for backup. Only from the inside-the-fence-line perspective rejected by the CPP are wind and solar generation non-emitting.

Part III: CAA Section 111(d) Performance Standards Must Be Based on Measures Applicable to and at the Source

After reconsidering the statutory text and context of CAA section 111(d) and the agency's historic practice, the Trump EPA concludes that BSER refers to actions "limited to emission reduction measures that can be *applied to or at* an individual stationary source." In other words, contrary to the legal theory underpinning the CPP, measures deemed to be BSER "must be based on a physical or operational change to a building, structure, facility, or installation at that source, rather than measures that the source's owner or operator can implement on behalf of the source at another location."²⁷

EPA offers five main reasons for limiting BSER to measures applicable to or at an individual stationary source:

First, it [BSER based on physical or operational changes at the source] accords with the meaning and application of relevant terms and phrases in CAA section 111 as they are used in other, related sections of the CAA. Second, it aligns with the Congressional intent underlying CAA section 111 as informed by relevant legislative history. Third, it aligns with the EPA's prior understanding of CAA section 111 as reflected in the Agency's prior regulatory actions. Fourth, it avoids illogical results when considered in light of other provisions of the statute. Finally, it avoids a policy shift of great significance for the relationship between the federal government and the states and avoids conflict with other federal legislation and interference with the separate role and jurisdiction of another federal agency, where there is inadequate indication that Congress intended to authorize the EPA to take actions leading to those results.²⁸

We concur with the agency's five reasons and proceed now to comment on each.

1. The proposed interpretation of BSER accords with the meaning and application of relevant CAA terms.

To inflate CAA section 111(d), a provision used only five times in 45 years to regulate four pollutants of local concern, into a national program for replacing fossil- with renewable-generation, the Obama EPA had to reimagine the key term: "source."

CAA section 111 defines "stationary source" as "any building, structure, facility, or installation which emits or may emit air pollutants." A building, structure, facility, or installation is a fixed physical object. As such, it exists within a particular boundary. In the parlance of the debate, every stationary source has a "fence line." Thus, every bona fide BSER is based on emission limitations that are achievable at reasonable cost through technological or operational changes made *inside the fence line*.

²⁷ 82 FR 48039

²⁸ 80 FR 48039

Since there are no CO₂ emission-reduction technologies owners can affordably retrofit onto their existing power plants,²⁹ limiting BSER to “inside-the-fence-line” measures would make Building Block 1 the only potential BSER option. However, heat-rate efficiency improvements would reduce power-sector CO₂ emissions by only a few percentage points.³⁰ Indeed, Building Block 1 in isolation could potentially increase aggregate emissions by reducing operating costs, making coal power plants more competitive (the “rebound effect”).³¹ In any event, increasing the efficiency of coal power plants would not advance President Obama’s longstanding goal to “finally make renewable energy the profitable kind of energy in America.”³²

To go beyond Building Block 1, the CPP reimagines “source” to include “owners” and “operators” in their capacity as economic actors in the electricity marketplace. It then imposes performance rates exceeding the capabilities of any individual coal or NGCC power plant but achievable on a sector-wide basis if owners and operators shift generation to lower- and zero-emission facilities elsewhere on the grid.

More fundamentally, the CPP imagines the entire U.S. power sector to be a single source. Referring to the Eastern, Western, and Texas Interconnections, the CPP enthuses that those “three synchronous systems each acts like a single machine.”³³ Indeed, the North American power sector is a “physically interconnected,” “coordinated,” “system” of “interdependent” actors, “integrated across large regions,” which operates as a “single,” “complex machine.”³⁴

From the premise that the U.S. power sector is a system of coordinated, interconnected, and interdependent actors, the CPP infers authority to regulate the entire electric marketplace as if the actual sources—the individual coal and NGCC power plants—are just cogs in a vast machine. By implication, owners and operators are responsible for the emission performance of the whole, and generation shifting is the heart of BSER.

There is just one massive problem. As noted above, the power sector is not a building, structure, facility, or installation, so it is not a source. Rather, the power sector is a market process encompassing thousands of generating units, many of which are not sources (i.e. do not emit air pollutants), plus millions of customers who do not generate electricity.

²⁹ EPA rejected carbon capture and storage (CCS) as too costly to qualify as BSER for existing coal and NGCC power plants, and also rejected converting coal boilers to combust gas (“fuel switching”) for the same reason. 79 FR 34876

³⁰ 79 FR 34859

³¹ 80 FR 64727, 64745, 64748. On the other hand, generation shifting per CPP building blocks 2 and 3 would decrease coal power plant efficiency and increase emission rates by turning baseload units into load followers with intermittent operation. See David T. Stephenson, “[RGGI] Carbon dioxide cap and trade dramatically lower power plant efficiency, and increase emissions,” Inside Energy, Caesar Rodney Institute for Energy Competitiveness,” April 11, 2018.

³² Eric Smalley, “Obama Spurs U.S. on in Clean Energy Race,” Wired, October 23, 2009, <https://www.wired.com/2009/10/obama-speech/>.

³³ 80 FR 64692

³⁴ 80 FR 64725-64726, 64739, 64740, 64768-64769, 64677

The CPP offers several policy reasons to make generation shifting the heart of BSER. However, policy reasons do not settle issues of law.

The CPP notes that other Clean Air Act and state air pollution programs utilize generation shifting, and grid operators routinely shift generation among power plants for economic and load balancing purposes.³⁵ That is correct. However, such generation shifting activities occur independently of CAA section 111 and do not make the North American electric grid a “source” under that provision.

The CPP also reminds us that the climatic effects of CO₂ emissions depend on global atmospheric concentrations rather than the geographic locations of particular sources. The CPP allows source owners to achieve emission reductions beyond the fence line that would be prohibitively costly to achieve inside the fence line. What’s not to like?³⁶

That argument begs the question of whether EPA may lawfully put owners in such a predicament in the first place. Obviously, once EPA uses generation shifting to set performance goals, few if any sources will be able to comply without generation shifting. But if BSER is limited to inside-the-fence-line measures, the standards would be far less onerous. Owners would not need to invest in, buy power from, subsidize, or cede market share to other facilities in order to comply.

The CPP further argues the word “system” in “best system of emission reductions” means any “set of things working together.”³⁷ Generation shifting policies such as emissions trading, renewable energy mandates, and dispatch protocols prioritizing gas over coal are a set of things several states “already” use to reduce CO₂ emissions. Why shouldn’t BSER reflect that reality?³⁸

That reasonable-sounding argument fails because the meaning of “system” in CAA section 111 depends on the meaning of “source.” That is a logical necessity because systems are designed for and apply to sources. EPA must correctly determine what qualifies as a source before it can decide what system is best for such sources. If CAA section 111 defined “source” as any economic sector, networked industry, or marketplace of interdependent producers which emits air pollutants, the CPP definition of BSER might be lawful. However, such an expansive concept of “source” conflicts with the statute’s plain words (“building, structure, facility, or installation”).

The CPP’s novel interpretation also conflicts with how “source” is understood in prior CAA 111 regulations as well as the companion and prerequisite CAA section 111(b)

³⁵ 80 FR 64771-64772

³⁶ 80 FR 64725

³⁷ 80 FR 64762

³⁸ 80 FR 64677-64678

NSPS rule for new coal and NGCC power plants.³⁹ In the new source rule, BSER—carbon capture and storage for new coal power plants and NGCC for new gas combustion turbines—clearly applies to each facility, not to entities outside the source that may function “interdependently” with it by virtue of their grid-based “interconnection.”

2. The proposed interpretation of BSER aligns with congressional intent.

There is no evidence in the statute, legislative history, or regulatory history that Congress intended for CAA section 111(d) to revise the nation’s electricity fuel mix, supervise state electric power resource development, or herd sources into statewide or regional cap-and-trade programs.

The CPP argues that its conception of BSER “mirrors Congress’ approach to regulating air pollution in this sector, as exemplified by Title IV of the CAA,” which created a system of marketable permits for sulfur dioxide (SO₂) emissions. Congress “designed the SO₂ portion of that program with express recognition of the sector’s ability to shift generation among various EGUs, which enabled pollution reduction by increasing reliance on natural gas-fired units and RE [renewable electricity].”⁴⁰ However, all that proves is that when Congress wants power plants to reduce emissions through generation shifting, it knows how to make its intent clear.

CAA section 111 contains none of the Title IV vocabulary (“allowance,”⁴¹ “auction,” “purchaser,” “seller,” “sales price,”⁴² “percentage of total generation decreased,”⁴³ “reduced output at the affected source”⁴⁴) that indicates a congressional intent to promote generation shifting. As the Supreme Court has stated, “[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.”⁴⁵

It is thus unreasonable to infer authority for market-based regulation under CAA section 111 from other CAA provisions where such authority is explicitly granted. As the CPP repeal proposal observes:

To the contrary, Congress expressly established the cap-and-trade program under title IV, 42 U.S.C. 7651–7651o, and expressly authorized the use of “marketable permits” to implement ambient air quality standards under CAA section 110, *id.* at §7410(a)(2)(A). We think it unlikely that Congress would have

³⁹ EPA, Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units; Final Rule, 80 FR 48037-48040, October 23, 2015, <https://www.gpo.gov/fdsys/pkg/FR-2015-10-23/pdf/2015-22837.pdf>

⁴⁰ 80 FR 65665, 64678

⁴¹ The term “allowance” occurs 367 times in CAA Title IV.

⁴² CAA section 416

⁴³ CAA section 404(e)(1)

⁴⁴ CAA section 408(c)(1)(B)

⁴⁵ *Russello v. United States*, 464 U. S. 16, 23 (1983)

silently authorized the Agency to point to trading [in other parts of the Act] in order to justify generation-shifting as a “system of emission reduction” [under CAA section 111(d)].⁴⁶

Moreover, when Congress enacted Title IV in 1990, it did not abandon technology-based regulation of electric power plants. The Title IV provision on clean coal technology clearly echoes EPA’s historic understanding of CAA section 111 performance standards: “This subsection applies to physical or operational changes to existing facilities.”⁴⁷

Although not discussed in the repeal proposal, Congress did not intend for CAA section 111(d) to be used to control ubiquitous air pollutants—those that “result from numerous or diverse mobile or stationary sources.”⁴⁸ As EPA’s 1975 implementing regulation explains, a major purpose of CAA section 111(d) is to control pollutants ineligible for regulation under the national ambient air quality standards (NAAQS) program because such pollutants “are not emitted from ‘numerous or diverse’ sources as required by section 108.”⁴⁹ Carbon dioxide, however, is emitted by more numerous *and* diverse sources than any other substance regulated under the CAA.

As the implementing rule also explains, because CAA section 111(d) air pollutants are not emitted by numerous or diverse sources, the health and welfare problems caused by such pollutants are “highly localized.”⁵⁰ In other words, proximity to the source largely determines the health and welfare risks posed by such pollutants. That is another reason Congress did not intend for CAA section 111(d) to regulate CO₂. The CO₂-greenhouse effect is global, not local. Whatever the impacts of CO₂ on global climate, or of climate change on particular communities, climate change risks have nothing to do with proximity to the source.

In short, carbon dioxide and CAA section 111(d) are a complete mismatch.

The 1975 implementation rule also opines that in CAA section 111(d), “Congress intended a technology-based approach rather than one based directly on health and welfare.”⁵¹ Several consequences follow from that assessment.

First, Congress intended CAA section 111(d) standards to reflect “the availability and costs of control technology,” which differ depending on the “sizes and types of facilities” and their location in “different parts of the country.” Accordingly, the rule anticipates “substantial variation in the degree of control required for particular sources rather than

⁴⁶ 82 FR 48042

⁴⁷ CAA Title IV, Section 415, <https://www.gpo.gov/fdsys/pkg/USCODE-2011-title42/html/USCODE-2011-title42-chap85-subchapIV-A-sec7651n.htm>

⁴⁸ CAA section 108(a)

⁴⁹ EPA, Final Procedures for Implementation of 111(d), November 17, 1975, 40 FR 53340, <https://www.scribd.com/document/225839610/Final-Procedures-for-Implementation-of-111-d-40-FR-53340-Monday-November-17-1975>

⁵⁰ 40 FR 53342

⁵¹ 40 FR 53343

identical standards for all sources.”⁵² A reasonable inference is that section 111(d) standards are to be tailored to the costs and limitations of individual facilities, not set so stringently that certain types of facilities must decrease output or shut down.

Second, EPA’s primary role in CAA section 111(d) rulemakings is to make available “information and expertise” gained from the agency’s “assessment of techniques for the control of the same pollutants [from new sources] under section 111(b).”⁵³ That role does not encompass authority to compel generation shifting on a sector-wide basis. As 21 states observe in their comments on the related advance notice of proposed rulemaking (ANPRM), the CPP unlawfully blurs Congress’s careful distinction “between control programs focused on an individual source’s performance and air quality programs designed to improve air quality by reducing a source category’s total emissions.”⁵⁴

In this connection, we note that CAA section 111 similarly lacks the NAAQS program’s specific authority to include “economic incentives such as fees, marketable permits, and auctions of emissions rights” in state implementation plans (SIPs).⁵⁵ Again, we should assume that Congress’s “disparate exclusion” of such language in section 111 is “intentional.”

Third, because CAA section 111(d) sources are not numerous and diverse, and have highly localized effects, “an extensive procedure, such as [NAAQS] SIPs require, is not justified.”⁵⁶ Yet the state plans required to implement the CPP are quite “extensive,” because they apply to entire sectors rather than, as in previous section 111(d) rules, to individual sources.

Since the CPP targets a ubiquitous “air pollutant” on a sector-wide basis, the question arises as to why the Obama EPA did not propose to establish NAAQS for CO₂ instead of CAA 111(d) performance standards. After all, EPA in December 2009 determined that greenhouse gas (GHG) emissions from new motor vehicles endanger public health and welfare.⁵⁷ Given that premise, EPA could not reasonably determine that GHG emissions from *both* numerous *and* diverse stationary *and* mobile sources pose no such danger.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Comments of West Virginia et al. on the advance notice of proposed rulemaking entitled State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units (EPA-HQ-OAR-2017-0545; FRL-9972-50-OAR), February 26, 2018, <https://ago.wv.gov/Documents/ANPR%20Comment%20Letter.PDF>

⁵⁵ CAA section 110(a)(2)(A)

⁵⁶ 40 FR 53343

⁵⁷ EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, 74 FR 66496-66546, December 15, 2009, https://www.epa.gov/sites/production/files/2016-08/documents/federal_register-epa-hq-oar-2009-0171-dec.15-09.pdf

Pursuing that logic,⁵⁸ in December 2009, the Center for Biological Diversity and 350.Org petitioned EPA to initiate a NAAQS rulemaking for CO₂ and other GHGs.⁵⁹ Yet over the next seven years, the Obama EPA took no action on the petition, and climate campaigners (including the petitioners) kept mum. Political calculation likely explains their behavior. The Obama administration and its allies concluded that an attempt to impose economy-wide CO₂ controls under the NAAQS program would ignite an even bigger firestorm than the CPP. Congress might step in to reverse *Massachusetts v. EPA*, or the Supreme Court might reconsider its ruling. As Attorney Eric Groten put it:

No doubt both sides of that transaction fear reaping the whirlwind, and perhaps even the overruling of *Massachusetts v. EPA*, 494 U.S. 497 (2007), as embarking on a GHG NAAQS no doubt would expose the error in Justice Stevens' assumption that "EPA jurisdiction [over GHG] would lead to no such extreme measures" as had precipitated earlier Supreme Court rulings rejecting grand agency claims of authority absent clear Congressional delegation.⁶⁰

It is because the Obama administration feared Congress or the courts would finally put a stop to EPA overreach that it devised a policy of misusing CAA section 111(d) to impose broad, NAAQS-like implementation plans on state electric power sectors.⁶¹

3. The proposed BSER aligns with the EPA's prior understanding of CAA section 111 as reflected in the Agency's prior regulatory actions.

All five of the previous section 111(d) rules used specific technologies to determine BSER for existing sources:

- **Scrubbers** (EPA, *Final Guideline Document: Control of Fluoride Emissions from Phosphate Fertilizer Plants*, EPA-450/2-77-005, March 1977,

⁵⁸ Note: We are here considering only the structural characteristics of NAAQS pollutants, i.e. their ubiquity due to the number and diversity of sources. Substantively, CO₂ is different from every other substance EPA regulates under the CAA. Carbon dioxide is non-toxic at many times ambient levels, is a natural constituent of clean air, helps protect plant life from environmental stresses, boosts agricultural productivity, and is an essential building block of the planetary food chain. See Craig D. and Sherwood B. Idso, *The Many Benefits of Atmospheric CO₂ Enrichment*, Center for the Study of Carbon Dioxide and Global Change, February 2011, <http://www.co2science.org/education/book/2011/55benefitspressrelease.php>

⁵⁹ Center for Biological Diversity, 350.Org, *Petition to Establish National Pollution Limits for Greenhouse Gases Pursuant to the Clean Air Act*, December 2, 2009, http://www.biologicaldiversity.org/programs/climate_law_institute/global_warming_litigation/clean_air_act/pdfs/Petition_GHG_pollution_cap_12-2-2009.pdf

⁶⁰ Eric Groten, "Here Be Dragons: Legal Threats to the ESPS Proposal," *Vinson & Elkins Climate Change Report*, September 2014 Issue 22, p. 9, fn. 64, <http://www.velaw.com/uploadedFiles/VESite/Resources/ClimateChangeReportESPSSpecialIssueSeptember2014.pdf#Art2>

⁶¹ For a critique of the Supreme Court's argument that the 1970 Clean Air Act is the statutory scheme Congress intended to regulate greenhouse gases, see Marlo Lewis, "The Unbearable Lightness of UARG v. EPA," *GlobalWarming.Org*, July 4, 2014, <http://www.globalwarming.org/2014/07/04/the-unbearable-lightness-of-uarg-v-epa/>

<http://www.globalwarming.org/wp-content/uploads/2014/05/Phosphate-fertilizer.pdf>)

- **Particle absorbers, mist eliminators** (EPA, *Final Guideline Document: Control of Sulfuric Acid Mist Emissions from Existing Sulfuric Acid Production Units*, EPA-450/2-77-019, September 1977, <http://www.globalwarming.org/wp-content/uploads/2014/05/Sulfuric-Acid-mist.pdf>)
- **Scrubbers, incinerators, washers** (EPA, *Kraft Pulping: Control of TRS [Total Reduced Sulfur] Emissions from Existing Mills*, EPA-450-2-78-003b, March 1979, <http://www.globalwarming.org/wp-content/uploads/2014/05/Kraft-pulping-mills.pdf>)
- **Gas collection hoods** (EPA, *Primary Aluminum Draft Guidelines for Control of Fluoride Emissions from Existing Primary Aluminum Plants*, EPA-450-2-78-049a, February 1979, <http://www.globalwarming.org/wp-content/uploads/2014/05/aluminum.pdf>)
- **Gas collection systems, combustors, open flare systems** (EPA, *Standards of Performance for New Stationary Sources and Guidelines for Control of Existing Sources: Municipal Solid Waste Landfills*, 61 FR 9905-9944, March 12, 1996, <http://www.gpo.gov/fdsys/pkg/FR-1996-03-12/pdf/96-5529.pdf>).

As the repeal proposal points out, the EPA’s prior understanding of BSER “is reflected not only in the handful of existing CAA section 111(d) rules that predated the CPP, but also in the much larger set of new-source rules under CAA section 111(b).”⁶²

However, that means even the CPP’s first BSER “building block”—improving coal power plants’ thermal efficiency—is inconsistent with the understanding reflected in EPA’s historic practice. Efficiency enhancements apply to and at an individual facility, and in that respect resemble previous BSER determinations. However, all previous CAA section 111 standards are based on specific technologies. It would be ridiculous, for example, to define BSER for primary aluminum plants in terms of incremental efficiency gains rather than technologies that can actually control fluoride emissions.

The Obama EPA acknowledged that retrofitting fossil-fuel power plants with carbon capture and storage (CCS) technology and modifying coal boilers to combust gas are too costly to pass muster as BSER.⁶³ However, the agency refused to face the obvious implications of those assessments: There is no “adequately demonstrated” best system for reducing CO₂ emissions from existing power plants. Hence, for that reason, too, the agency may not lawfully require states to adopt CO₂ performance standards for existing power plants.

⁶² 82 FR 48039

⁶³ 79 FR 34876

4. The proposed BSER avoids illogical results when considered in light of other provisions of the statute.

BSER as defined in the CPP leads to four bizarre regulatory consequences. First, the CPP imposes tougher emission standards on existing—in some cases decades-old—power plants than the corresponding and prerequisite new source rule imposes on state-of-the-art new sources. CPP performance standards are 1,305 lbs. CO₂/MWh for existing coal power plants and 771 lbs. CO₂/MWh for existing NGCC power plants.⁶⁴ The new source rule’s performance standards are 1,400 lbs. CO₂/MWh for new coal power plants and 1,000 lbs. CO₂/MWh for new NGCC plants.⁶⁵

An ESPS that is more stringent than the corresponding NSPS was unheard of until the CPP. It defies the logic and intent of CAA section 111(d), which is to use the experience gained from NSPS regulation to develop performance standards appropriate for existing sources.⁶⁶ “Existing pollution sources (such as old factories) are generally required to meet less onerous standards than those applicable for new sources, largely because it is considered more costly to retrofit an old factory than to build pollution control devices into a new one,” Brookings Institution scholar Robert Crandall explains.⁶⁷ EPA’s 1975 implementing regulation similarly observes that CAA section 111(d) regulations “will ordinarily be less stringent than those required by standards of performance for new sources because the costs of controlling existing facilities will ordinarily be greater than those for controlling new sources.”⁶⁸

Even in a case where pollution control technology costs no more for an existing facility than a new one, the existing source typically faces a greater relative burden because it is closer to the end of its useful life. Accordingly, CAA section 111(d) instructs states to “take into consideration, among other things, the remaining useful life of the existing source” when setting ESPS.

Another bizarre consequence: The CPP’s so-called performance standards are actually *non-performance mandates*. Meeting the standards requires owners and operators to reduce output from existing coal and gas power plants.⁶⁹ Producing less power does nothing to improve an existing coal or NGCC power plant’s environmental *performance*.

⁶⁴ 80 FR 64742

⁶⁵ 80 FR 64512-64513

⁶⁶ 40 FR 53343

⁶⁷ Robert Crandall, “Pollution Controls,” Library of Economics and Liberty: The Concise Encyclopedia of Economics, <http://www.econlib.org/library/Enc1/PollutionControls.html>

⁶⁸ 40 FR 53341

⁶⁹ Relative to the base case, the CPP projects a 22-23 percent decline in coal generation by 2030. On the other hand, it projects a 5-18 percent increase in existing NGCC generation. However, the CPP tilts the marketplace not only in favor of gas at the expense of coal, but also in favor of renewables at the expense of gas. The CPP thus projects new NGCC generation to decline 36-69 percent below the base case by 2030. EPA, Regulatory Impact Analysis for the Clean Power Plan Final Rule, October 23, 2015, 3-27, <https://archive.epa.gov/epa/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf>. Moreover, the 2022-2030 compliance period is just the first in a series. If allowed to stand, the CPP will sooner or later require cutbacks in generation from existing NGCC power plants as well.

All previous CAA section 111 standards, whether for new or existing sources, specify a rate between emissions and unit of heat input or production. Ceding market share to entities outside the source does not reduce the source's emissions relative to its heat input or production.⁷⁰ "Produce less" or "Don't use it" is not a valid CAA performance standard.⁷¹

A related bizarre result is that although CAA section 111(d) deals solely with "existing" facilities in specified industrial source categories (in this instance, fossil fuel power plants), the CPP exerts pressure on owners and operators to invest in *new* wind and solar units that are not even *sources*.

Finally, as discussed in the repeal proposal, CPP emission standards for existing sources are more stringent than CAA section 165 "best available control technology" (BACT) standards for new and modified fossil fuel power plants. Yet CAA section 111 new source performance standards are considered the "floor" for BACT, which by law may not be less stringent than the corresponding NSPS.⁷²

Part IV: Additional Statutory Reasons to Repeal the CPP

Even if the CPP were based on emission-reduction measures applicable to and at the source, it would still be unlawful. Five additional statutory reasons not mentioned in the repeal proposal lead to that conclusion. We have already discussed three:

1. There is no adequately demonstrated "best system" for reducing CO₂ emissions from existing power plants. Absent a bona fide BSER, CAA section 111(d) may not be used to regulate CO₂ emissions from those facilities.
2. Congress intended for CAA section 111(d) to address air pollutants with "highly localized" effects from sources that are not "numerous or diverse." Carbon dioxide emissions have the opposite characteristics. The CO₂ greenhouse effect is global, not local, and CO₂ is emitted by both numerous and diverse sources.
3. Improving heat-rate efficiency—the CPP Building Block 1 strategy—stays "inside the fence line" but is inconsistent with the understanding of BSER reflected in EPA's historic practice. Until the CPP, the EPA always based BSER for both new and existing sources on specific emission control technologies, not recipes to improve the source's operating efficiency.

A fourth statutory reason not mentioned in the repeal proposal is that the CPP lacks a lawful prerequisite CAA section 111(b) new source rule. Before EPA may promulgate emission guidelines for existing stationary sources, it must first, or simultaneously, promulgate emission standards for new sources in the same category. The Obama EPA

⁷⁰ 82 FR 61512

⁷¹ Groten, *Ibid.*, pp. 15-17

⁷² 82 FR 48041

determined that “partial” carbon capture and storage (CCS) is the “adequately demonstrated” BSER for new coal power plants.⁷³

However, CCS is not adequately demonstrated. Southern Company’s CCS project in Kemper, Mississippi is a case in point. Originally estimated at \$2.2 billion, the project was three years behind schedule, eventually cost \$7.5, and was finally converted into an NGCC power plant. Kemper received a \$270 million grant from the Department of Energy plus hundreds of millions in investment tax credits and ratepayer subsidies. Proximity to enhanced oil recovery (EOR) operations—the expected market for its captured CO₂—was an essential part of the Kemper business plan.⁷⁴

In short, CCS is not adequately demonstrated because it is too costly, too subsidy-dependent, and not even plausibly economical unless paired with EOR operations, which are geologically-limited to specific regions. Lacking a valid prerequisite 111(b) rule, the Obama EPA’s 111(d) rule is also invalid.

The fifth additional statutory reason to repeal the CPP is the so-called Section 112 Exclusion. CAA section 111(d) excludes from its regulatory purview “any air pollutant . . . emitted by a source category regulated under CAA section 112.” CAA section 112 requires EPA to list and regulate categories of industrial sources of hazardous air pollutants (HAPs), such as arsenic, mercury, and cyanide. Coal- and oil-fueled power plants have been regulated as HAP sources under section 112 since 2012,⁷⁵ and NGCC combustion turbines since 2004.⁷⁶

Therefore, EPA may not regulate power plants under CAA section 111(d). The CPP is unlawful under the very provision that purportedly authorizes it. Any CPP replacement rule would be unlawful for the same reason.⁷⁷

Part V: Broader Policy Concerns

⁷³ 80 FR 64512-64513

⁷⁴ MIT, Kemper County IGCC Fact Sheet: Carbon Dioxide Capture and Storage Project, <https://sequestration.mit.edu/tools/projects/kemper.html>; Jeff Amy, “Southern Company Inks Deal on Kemper County,” AP, December 6, 2017, <https://www.power-eng.com/articles/2017/12/southern-company-inks-deal-on-kemper-county.html>; Ian Urbina, “Piles of Dirty Secrets Behind a Model ‘Clean Coal’ Project,” New York Times, July 5, 2016, https://www.nytimes.com/2016/07/05/science/kemper-coal-mississippi.html?emc=edit_th_20160705&nl=todaysheadlines&nid=59669759&referer&r=0

⁷⁵ EPA, National Emission Standards for Hazardous Air Pollutants From Coal and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 77 FR 9304-9513, February 16, 2012, <https://www.gpo.gov/fdsys/pkg/FR-2012-02-16/pdf/2012-806.pdf>

⁷⁶ EPA, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines; Final Rule, 69 FR 10512-10548, March 5, 2004, <https://www.gpo.gov/fdsys/pkg/FR-2004-03-05/pdf/04-4530.pdf>

⁷⁷ For a detailed defense of the Section 112 Exclusion, see Marlo Lewis, Competitive Enterprise Institute, Comments on Potential Clean Power Plan Replacement Rule, Advance Notice of Proposed Rulemaking, EPA–HQ–OAR–2017–0545, February 26, 2018, <https://cei.org/content/comments-marlo-lewis-potential-clean-power-plan-replacement-rule>

1. The proposed BSER avoids a policy shift of great significance for the relationship between the federal government and the states.

In their comments on the ANPRM, 21 states led by West Virginia cite statutory provisions and court cases as evidence that regulation of retail electricity markets is a “traditional state power” upon which EPA may not encroach “unless Congress has clearly authorized such intrusion.”⁷⁸ We concur and incorporate their argument by reference.

In addition, we want to explain why the CPP endangers the federal system’s ability to restrain the cost and growth of government.

Federalism is a structural pillar of our republic. From a citizen’s perspective, federalism’s chief value is to safeguard economic opportunity and check abuses of power.⁷⁹ Federalism enables Americans to “vote with their feet” for or against policy regimes they like or dislike. When a state’s tax and regulatory policies make it hard to find gainful employment, start a business, or compete in the global marketplace, citizens and firms can relocate to states with more efficient policies. In so doing, they punish the anti-growth state with a brain drain, loss of tax revenue, and even loss of seats in the House of Representatives. They simultaneously reward the pro-growth states to which they move with an increase in human and financial capital, a bigger tax base, and additional House seats.⁸⁰

In *Poor States, Rich States*, Arthur B. Laffer, Stephen Moore, and Jonathan Williams report that from 2002 to 2016, roughly 20 million residents moved from one state to another, and during 1997-2015, such population shifts produced an annual migration of \$2.8 trillion in adjusted gross income.⁸¹ The charts below provide additional detail.

⁷⁸ West Virginia et al., Comments on ANPRM, pp. 6-7

⁷⁹ Michael S. Greve, *The Upside-Down Constitution* (Cambridge: Harvard University Press, 2012)

⁸⁰ Arthur B. Laffer, Stephen Moore, Jonathan Williams, *Rich States, Poor States: ALEC-Laffer State Economic Competitiveness Index*, 10th Edition, American Legislative Exchange Council, 2017, pp. 2-8, <https://www.alec.org/app/uploads/2018/01/RSPS-2017-WEB.pdf> (hereafter Laffer et al.)

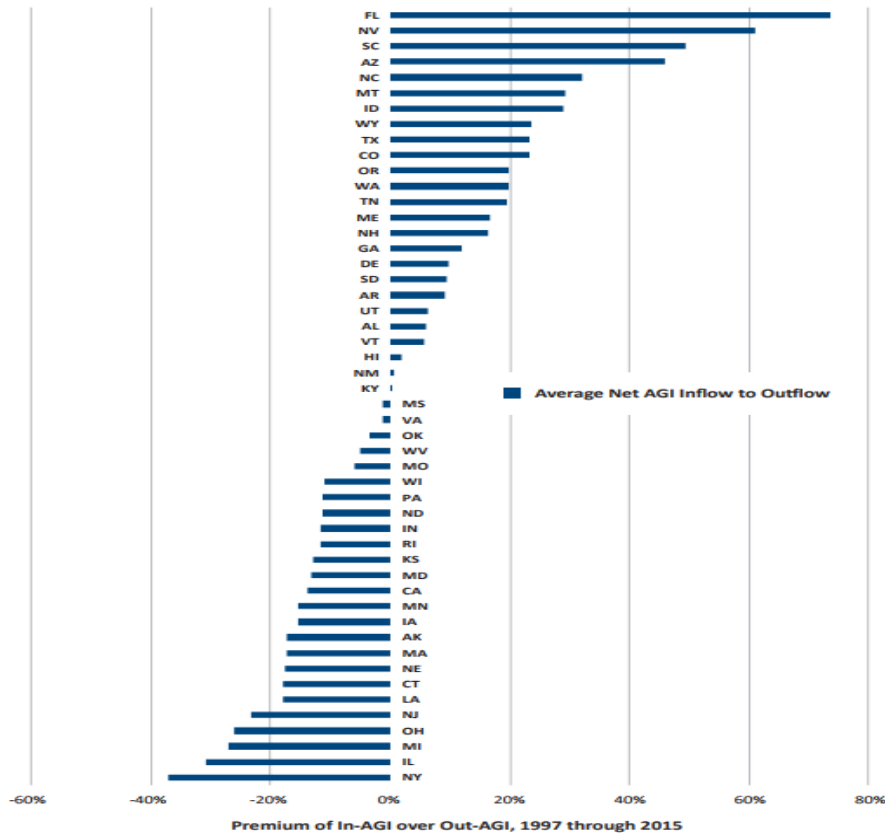
⁸¹ Laffer et al., p. 2

TABLE 2 | State Migration Winners and Losers

The Ten States with the Greatest Net In-Migration Net Domestic Migration (Cumulative 2006-2015)			The Ten States with the Greatest Net Out-Migration Net Domestic Migration (Cumulative 2006-2015)		
Rank	State	Absolute Domestic Migration	Rank	State	Absolute Domestic Migration
1	Texas	1,475,425	41	Pennsylvania	-127,785
2	Florida	779,441	42	Maryland	-158,444
3	North Carolina	609,275	43	Connecticut	-165,489
4	Arizona	450,976	44	Louisiana	-223,156
5	Georgia	378,095	45	Ohio	-363,913
6	Colorado	362,153	46	New Jersey	-525,338
7	South Carolina	359,754	47	Michigan	-593,157
8	Washington	302,829	48	Illinois	-690,578
9	Tennessee	261,544	49	California	-1,103,301
10	Oregon	209,592	50	New York	-1,381,449

Source: U.S. Census Bureau

FIGURE 1 | Wealth Flows to Low-Tax States and Away from High-Tax States



Because many retirees move from the Northeast and Midwest to the Sunbelt, it is tempting to attribute migration patterns to differences in weather and climate. In fact, the economic effects of policy differences are more important. As Laffer et al. point out, New Hampshire, Maine, Montana, and other states with harsh winters are gaining AGI from domestic migration as sunny and picturesque California loses people and wealth.

Laffer et al. rank states in terms of 15 policy variables that affect the migration of human and financial capital into and out of states. Most of the variables have to do with tax burdens (heavy vs. light) and labor policy (restrictive vs. right-to-work). We note, in addition, that 10 states with the greatest cumulative net in-migration also have electricity prices at or below the national average, whereas eight of 10 states with the greatest cumulative net out-migration have higher-than-average electricity rates, and five of those states (New York, California, New Jersey, Massachusetts, and Connecticut) have substantially higher-than-average rates.⁸² Because energy policies affect energy prices, competitiveness, and economic growth, they also affect migration patterns.⁸³ After taking living costs including energy prices into account, California has the highest “effective” poverty rate of any state in the nation.⁸⁴

Both the proposed and final CPP cite the California Global Warming Policy Solutions Act (AB 32) and the Northeast Regional Greenhouse Gas Initiative (RGGI) as examples of what “states” are “already” doing to control power-sector CO₂ emissions.⁸⁵ In effect, the CPP establishes an EPA-coordinated policy cartel, exporting California/RGGI-style energy policies and prices throughout the land. The CPP’s predictable consequence—and, thus, perhaps, an underlying objective—is to undermine other states’ energy cost advantage relative to California and the RGGI states.

Over time, the CPP could have large impacts on national political balances. There is little point in electing governors and legislators who champion pro-growth energy policies if federal regulations do not allow states to pursue such policies. Moreover, state governments provide most of the candidates for federal office. If, under the CPP’s aegis, state and regional cap-and-trade programs sprout like mushrooms, and all states adopt aggressive renewable energy quota, opinion on Capitol Hill will likely shift in favor of what are deemed “progressive” energy policies.

Repealing the CPP will help restore choice and competition in energy policy, which in turn will help safeguard choice and competition in American politics.

⁸² Energy Information Administration, Electric Power Monthly, Data for November 2017, January 24, 2018, https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a

⁸³ Chuck Devor, “Texas v. California: The Real Facts Behind the Lone Star State’s Miracle,” Forbes, July 3, 2013, <https://www.forbes.com/sites/realspin/2013/07/03/texas-v-california-the-real-facts-behind-the-lone-star-states-miracle/#7d6981316c7c>

⁸⁴ Chris Nichols, “TRUE: California has the nation’s highest poverty rate, when factoring in cost-of-living,” Politifact California, January 17, 2017, <http://www.politifact.com/california/statements/2017/jan/20/chad-mayes/true-california-has-nations-highest-poverty-rate-w/>

⁸⁵ 79 FR 34833-34834, 34848, 34880; 80 FR 64725, 64769, 64919

2. The proposed BSER avoids a policy shift of great significance that lacks any clear or plausible congressional authorization.

That is almost too obvious to require elaboration. The CPP makes EPA the nation’s de-facto climate lawgiver⁸⁶ and electricity czar, directing potentially hundreds of billions of dollars in energy infrastructure investment over the next several decades. There is zero evidence Congress intended to delegate such sweeping powers to EPA. The following legislative history makes that clear.

Congress enacted CAA section 111 in 1970 and amended it in 1977 and 1990. The 1990 language is virtually identical to the 1970 language.⁸⁷ It is utterly implausible that in 1970, Congress intended for CAA section 111 to de-carbonize state power sectors.

Indeed, the 1970 and 1977 texts of the CAA do not mention “carbon dioxide,” “greenhouse gases,” “greenhouse effect,” or “global warming.” Not until the 1990 amendments does the CAA address global climate change, albeit only obliquely, in non-regulatory provisions.

As originally introduced on September 14, 1989, S. 1630, the Senate version of the 1990 CAA Amendments contained a provision (section 206) to establish CO₂ emission standards for new motor vehicles.⁸⁸ The Senate Environment and Public Works Committee approved a bill called “The Stratospheric Ozone and Climate Protection Act,” envisioned as Title VII of the amended CAA. Title VII would have authorized EPA to regulate ozone-depleting substances based in part on their “global warming potential” and establish CO₂ and methane emission reduction as a national goal. The full Senate deleted the automobile CO₂ standards, and the House-Senate conference committee approved only faint echoes of Title VII’s “climate protection” provisions.⁸⁹

Instead of declaring a national goal to reduce CO₂ and methane emissions, Congress directed EPA, in CAA section 103(g), to develop “non-regulatory strategies and technologies”⁹⁰ to reduce CO₂ among other “multiple air pollutants” from stationary sources. Instead of directing EPA to consider global warming potential when regulating ozone depleting chemicals, Congress directed the agency, in CAA section 602(e), to “publish” (i.e. study) the global warming potential of such substances.

⁸⁶ The power sector is a ‘commanding height’ of the U.S. economy, sustaining all other industries. In addition, if upheld, the CPP could become a precedent for expanding state and regional cap-and-trade programs to encompass other industrial source categories.

⁸⁷ 80 FR 64700

⁸⁸ Text is available at <https://www.congress.gov/bill/101st-congress/senate-bill/1630/text/is?q=%7B%22search%22%3A%5B%22S.1630%22%5D%7D&r=23>

⁸⁹ For a more detailed discussion of climate policy and the 1990 CAA Amendments, see Arnold W. Reitze, *Air Pollution Control Law: Compliance and Enforcement* (Washington, D.C: Environmental Law Institute, 2001), pp. 415-416

⁹⁰ To make sure nobody could mistake Congress’s intent, the term “non-regulatory” occurs six times in section 103(g).

Moreover, both provisions admonish EPA not to jump to regulatory conclusions. After including CO₂ among “multiple air pollutants,” CAA section 103(g) states: “Nothing in this subsection shall be construed to authorize the imposition on any person of air pollution control requirements.” After mentioning “global warming potential,” CAA section 602(e) states: “The preceding sentence shall not be construed to be the basis of any additional regulation under this chapter [i.e., the CAA].”

In short, when Congress last amended CAA section 111(d), it also told the agency not to control CO₂ emissions from stationary sources and not to regulate other substances based on global warming potential.⁹¹

During 2009-2010, President Obama and EPA administrator Lisa Jackson tried to use the looming prospect of EPA regulation of GHGs to prod Congress into passing a cap-and-trade bill. They warned that an EPA-run system would be less efficient, less predictable, and less attuned to regional interests than the “clean energy and climate legislation” the House was debating.⁹² Their sales pitch clearly implied that, however strong congressional opposition to cap-and-trade might be, opposition to an EPA-run system was even stronger.

Nonetheless, cap-and-trade failed. In June 2009, the House narrowly passed the cap-and-trade bill sponsored by Reps. Henry Waxman (D-Calif.) and Ed Markey (D-Mass.)⁹³ Public opinion quickly turned against “cap-n-tax.” Over the next year, Senators Reid (D-Nev.), Kerry (D-Mass.), Boxer (D-Calif.), Lieberman (I-Conn.), and Graham (R-S.C.) tried to line up bipartisan support for companion legislation. Rebranding the policy as “pollution” control and “linked fee”⁹⁴ did not mollify opponents. A \$100 million lobbying campaign by green groups failed to win a “single Republican convert” to cap-and-trade.⁹⁵ In late July, Senate leaders scuttled plans to vote on a companion bill.⁹⁶

⁹¹ In *Massachusetts v. EPA* (2007) and again in *American Electric Power v. Connecticut* (2011), the Supreme Court held that the 1970 Clean Air Act “speaks directly” to the issue of anthropogenic global warming. That is incorrect. Not until the 1990 amendments does the Act address the issue *indirectly*, and when it does, it audibly prohibits EPA from controlling emissions.

⁹² Bryan Walsh, “EPA’s CO₂ Finding: Putting a Gun to Congress’s Head,” *Time*, April 18, 2009, <http://content.time.com/time/health/article/0,8599,1892368,00.html>; Daniel Stone, “Can EPA Chief Lisa Jackson Force a Climate Deal?” *Newsweek*, April 1, 2010, <http://www.newsweek.com/can-epa-chief-lisa-jackson-force-climate-deal-70425>

⁹³ H.R. 2454, the American Clean Energy and Security Act, sponsored by Reps. Henry Waxman (D-Calif.) and Ed Markey (D-Mass.) in the 111th Congress, <http://www.gpo.gov/fdsys/pkg/BILLS-111hr2454pcs/pdf/BILLS-111hr2454pcs.pdf>

⁹⁴ Darren Samuelsohn, “Reid Warms to July Climate Vote,” *Politico*, July 13, 2010, <https://www.politico.com/story/2010/07/reid-warms-to-july-climate-vote-039677>; Robert Puentes, “A Linked-Fee for Carbon Reduction?” *The Avenue-Brookings Institution*, March 12, 2010, <https://www.brookings.edu/blog/the-avenue/2010/03/12/a-linked-fee-for-carbon-reduction/>

⁹⁵ Darren Samuelsohn, “Greens defend climate tactics,” *Politico*, August 5, 2010, <https://www.politico.com/story/2010/08/greens-defend-climate-tactics-040680>

⁹⁶ Evan Lehmann, “Senate Abandons Climate Effort, Dealing Blow to President,” *New York Times*, July 23, 2010, <http://www.nytimes.com/cwire/2010/07/23/23climatewire-senate-abandons-climate-effort-dealing-blow-88864.html?pagewanted=all>

Cap-and-trade was arguably the key issue on which Democrats lost control of the House in the November 2010 elections. In the House races, “virtually every close race was lost by a Democrat” who voted for Waxman-Markey, notes Cato Institute scientist Patrick Michaels. In contrast, the Senate never voted on cap-and-trade, and “every close Senate race was won by a Democrat.”⁹⁷

On the day after the 2010 elections, President Obama remarked that cap-and-trade was “just one way of skinning the cat” and vowed to find “other means” of addressing climate change.⁹⁸ In his 2011 state of the union speech, he proposed a national clean energy standard (CES) whereby 80 percent of U.S. electric power would come from “clean sources” by 2035.⁹⁹ Although he did not mention it, the proposed standard was virtually identical to the 2030 electricity fuel mix projected by the U.S. Energy Information Administration (EIA) for the Waxman-Markey bill.¹⁰⁰

In March 2012, Sen. Jeff Bingaman (D-N.M.) introduced a CES bill based on Obama’s proposal. However, the legislation went nowhere. The Senate Energy and Natural Resources Committee held a hearing on the bill but did not vote on it.¹⁰¹

Regulatory climate policy had so little political appeal through the end of 2012 that neither President Obama nor Democratic lawmakers campaigned for cap-and-trade, a national clean energy standard, or a successor treaty to the Kyoto Protocol. Indeed, on energy policy, Obama claimed credit for the shale boom and ran to the right of GOP candidate Mitt Romney, accusing his rival of being anti-coal.¹⁰²

In a democracy, policy is supposed to derive from statutes, which in turn are supposed to derive from elections. Nonetheless, although presidential candidate Obama ran *from* climate policy during his 2012 election campaign, once re-elected, he governed as if endowed with a popular mandate to suppress the production, transport, and use of fossil fuels via executive action. In June 2013, President Obama unveiled his Climate Action Plan, which directed the EPA “to work expeditiously to complete carbon pollution

⁹⁷ Patrick Michaels, “IPCC Political Suicide Pill: Politicians who legislated based on the IPCC’s increasingly flawed findings lose their jobs,” *National Review*, September 26, 2013,

<http://www.nationalreview.com/article/359556/ipcc-political-suicide-pill-patrick-j-michaels#!>

⁹⁸ Press Conference by the President, November 3, 2010, <https://obamawhitehouse.archives.gov/the-press-office/2010/11/03/press-conference-president>

⁹⁹ Obama’s State of the Union Transcript 2011, Politico, January 25, 2011,

<https://www.politico.com/story/2011/01/obamas-state-of-the-union-transcript-2011-full-text-048181>

¹⁰⁰ Marlo Lewis, “Obama Recycles Waxman-Markey Utility Sector Target—Neglects to Inform Congress, Public,” *GlobalWarming.Org*, January 26, 2011, <http://www.globalwarming.org/2011/01/26/obama-recycles-waxman-markey-utility-sector-target-neglects-to-inform-congress-public/>

¹⁰¹ S.2146, Clean Energy Standard Act of 2012, <https://www.congress.gov/bill/112th-congress/senate-bill/2146>

¹⁰² William Yeatman, “On Energy Policy, Debate Obama Bears No Resemblance to Real Life Obama,” *GlobalWarming.Org*, October 17, 2012, <http://www.globalwarming.org/2012/10/17/on-energy-policy-debate-obama-bears-no-resemblance-to-real-life-obama/>

standards for both new and existing power plants.”¹⁰³ One year later, EPA proposed the CPP.

To repeat, since the Obama administration itself deemed an EPA-run system to be inferior to cap-and-trade, even citing avoidance of EPA regulation as a reason to pass the Waxman-Markey bill, there must have been even less support in Congress for a policy like the CPP. Indeed, had Reps. Waxman and Markey sponsored legislation authorizing EPA to de-carbonize the U.S. power sector via CAA rulemakings, the bill almost certainly would have been dead on arrival.

What we know for a fact is that in 2015, despite more than 25 years of global warming advocacy, the House and Senate passed S.J.Res.24, a Congressional Review Act resolution of disapproval to overturn the CPP.¹⁰⁴ The notion that Congress implicitly signed off on the CPP in 1970, 1977, or 1990 is both unhistorical and unbelievable.

The CPP was a climate coup in which an administrative agency usurped legislative power from the people’s representatives to impose a major national policy initiative with no democratic legitimacy.

Part VI: Avoided Compliance Costs, Foregone Benefits, Modeling Assumptions, Uncertainties, and Other Relevant Matters

The Obama EPA’s Regulatory Impact Analysis (RIA) estimated the CPP would deliver \$34 billion to \$54 billion in combined climate and air-quality co-benefits in 2030 (assuming a 3 percent discount rate), compared to \$8.4 billion in compliance costs. In other words, the CPP would yield net benefits of \$26 billion to \$45 billion—about \$4 in benefits for every dollar “invested.”¹⁰⁵ The draft RIA¹⁰⁶ accompanying the Trump EPA’s repeal proposal dramatically scales back CPP climate and health benefit estimates. The draft RIA is a welcome step in the right direction. However, further steps are needed to curb ideological flimflam in regulatory accounting.

1. Social Cost of Carbon Dioxide

A. Basics

¹⁰³ Executive Office of the President, The President’s Climate Action Plan, June 2013, <https://obamawhitehouse.archives.gov/sites/default/files/image/president27sclimateactionplan.pdf>

¹⁰⁴ Text is available at <https://www.congress.gov/bill/114th-congress/senate-joint-resolution/24?q=%7B%22search%22%3A%5B%22S.J.+Res.+24%22%5D%7D&r=1>

¹⁰⁵ 80 FR 64680; EPA, Regulatory Impact Analysis for the Clean Power Plan Final Rule, ES-22, October 23, 2015, <https://archive.epa.gov/epa/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf> (hereafter RIA 2015)

¹⁰⁶ EIA, Regulatory Impact Analysis for the Review of the Clean Power Plan: Proposal, October 2017, https://www.epa.gov/sites/production/files/2017-10/documents/ria_proposed-cpp-repeal_2017-10.pdf (hereafter RIA 2017)

EPA's 2016 Fact Sheet provides a useful overview of social cost of carbon dioxide (SC-CO₂) analysis as practiced by EPA and other agencies.¹⁰⁷ The following paragraphs draw freely from that document.

The SC-CO₂ is an estimate, in dollars, of the cumulative long-term damage done by a ton of CO₂ emitted in a given year. That dollar figure also represents an estimate of the benefit of avoiding or reducing one ton of CO₂ emissions.

The computer programs used to estimate SC-CO₂ values are called integrated assessment models (IAMs) because they combine a climate model, which estimates the physical impacts of CO₂ emissions, with an economic model, which estimates the dollar value of climate change impacts on agricultural productivity, human health, property damages, energy system costs, and other economic variables.

The cumulative damage of an incremental ton of CO₂ emissions is estimated over long timespans. In federal agency analyses, the damage is estimated from the year of the emission's release until 2300.

SC-CO₂ estimates are highly sensitive to the discount rates selected to calculate the present value of future emissions and reductions. The lower the discount rate, the higher the present value of future climate damages and emission reductions, and vice versa.

Federal agencies average the results of three IAMs to estimate SC-CO₂ values. For any given year, there are four SC-CO₂ estimates. The first three values present the SC-CO₂ at discount rates of 5, 3, and 2.5 percent. Agencies also use a fourth value to represent the incremental damages associated with "lower-probability, higher-impact" events such as ice sheet collapse. Specifically, "the fourth value corresponds to the 95th percentile of the frequency distribution of SC-CO₂ estimates based on a 3 percent discount rate."

B. Garbage In, Garbage Out

Multiplying the number of cumulative tons of CO₂ avoided by SC-CO₂ values, the RIA for the CPP projects up to \$61 billion in climate benefits by 2030, with a mean estimate of \$20 billion.¹⁰⁸ Since CPP compliance costs in 2030 are estimated at \$5.1 billion to \$8.4 billion,¹⁰⁹ the CPP looks like a cost-effective climate policy.

However, the CPP's putative climate benefits are a mirage. The SC-CO₂ is not an objective physical or economic magnitude but a projection of IAMs, which "integrate" speculative climatology with speculative economics. IAM estimates are inherently subjective and conjectural because:

¹⁰⁷ EPA Fact Sheet, Social Cost of Carbon, 2016, https://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf

¹⁰⁸ RIA, p. ES-20

¹⁰⁹ 80 FR 64679

- No one can forecast the baseline emission trajectory of the global economy out to 2300, but it is only in relation to some assumed baseline that the incremental effects of the next ton of CO₂ might be estimated.
- Scientists do not know the relative strength of the positive and negative feedbacks that amplify or constrain the climate's response to rising CO₂ concentrations. That is why the Intergovernmental Panel on Climate Change (IPCC) has been unable to narrow the “likely” range of “equilibrium climate sensitivity” (ECS)—the long-term warming from a doubling of atmospheric CO₂ concentration. The likely range is 1.5°C to 4.5°C in both the IPCC's first (1990) report¹¹⁰ and fifth (2013) report.¹¹¹
- To guestimate climate damages, IAMs must also make non-validated assumptions about how rising temperatures will affect weather patterns, sea-levels, and other natural phenomena, and how such physical changes will affect agriculture, other climate-sensitive industries, and consumption absent adaptive responses.
- Human beings use technology to adapt to environmental conditions. Consequently, the “damage functions” in IAMs—the projected impacts of climate change on consumption, climate-sensitive industries, and human health—depend on assumptions about how technology will develop as the world warms. Nothing is harder to forecast than long-term technological change.

C. Accounting Gimmickry

As noted, the lower the discount rate used to calculate SC-CO₂ values, the higher the present value of CO₂ reduction policies. Office of Management and Budget (OMB) guidance directs agencies to use discount rates of 7 and 3 percent in benefit-cost analysis.¹¹² The RIA for the CPP uses discount rates of 5, 3, and 2.5 percent. The RIA's high and low rates are below the OMB-recommended high and low rates. That inflates the present value of the CPP's alleged climate benefits.

The RIA also doctors the CPP benefit-cost ratio by comparing apples to oranges. Instead of comparing CPP compliance costs, which are almost entirely domestic, to potential domestic climate benefits, the RIA compares CPP compliance costs to the global climate benefits projected to accrue to all nations on Earth. That, too, flouts OMB guidance, according to which “analysis of economically significant proposed and final

¹¹⁰ IPCC, First Assessment Report (FAR), *Climate Change: The IPCC Scientific Assessment* (1990), Chapter 5, Equilibrium Climate Change, p. 139, https://www.ipcc.ch/ipccreports/far/wg_i/ipcc_far_wg_i_chapter_05.pdf

¹¹¹ IPCC, *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Summary for Policymakers, p. 16, http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf

¹¹² OMB Circular A-4, *Regulatory Impact Analysis: A Primer*, p. 11, https://www.reginfo.gov/public/jsp/Utilities/circular-a-4_regulatory-impact-analysis-a-primer.pdf

regulations from the domestic perspective is required, while analysis from the international perspective is optional.”¹¹³

D. No Detectable Benefits

What makes the huge CPP climate benefits in 2030 thoroughly implausible is that even in 2100, the CPP’s physical impacts on global climate would be inconsequential and unverifiable. According to EPA’s own climate change calculator, a program called Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC), the CPP would avert only 0.018°C of warming by 2100.¹¹⁴ That vanishingly small change would make no discernible difference to sea levels, weather patterns, polar bear populations, or any other climate-related indicator people care about.

Indeed, in a colloquy with Rep. Mike Pompeo (R-Kansas), former EPA administrator Gina McCarthy admitted that all adopted and proposed Obama administration climate policies combined would have no measurable effect on any of the agency’s 26 climate change indicators.¹¹⁵ CPP compliance costs and market impacts in 2030 would be very real, but the benefits would be imperceptible and hypothetical, existing only in the virtual world of integrated assessment models.

E. Trump EPA’s Proposed Corrections

The Trump EPA’s draft RIA makes two important corrections. Following OMB guidance, the draft RIA uses both 7 and 3 percent discount rates and compares domestic costs with domestic benefits. Those accounting corrections substantially reduce estimated CPP climate benefits, which now fall well below estimated compliance costs.¹¹⁶

¹¹³ Interagency Working Group on the Social Cost of Carbon, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, 2010, p. 10, https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf

¹¹⁴ Patrick Michaels and Paul C. “Chip” Knappenberger, “0.02°C Temperature Rise Averted—The Vital Number Missing from EPA’s ‘By the Numbers’ Fact Sheet,” *Watts Up With That*, June 12, 2014, <https://wattsupwiththat.com/2014/06/12/epa-leaves-out-the-most-vital-number-in-their-fact-sheet/>

¹¹⁵ For a transcript of the colloquy, see Marlo Lewis, “Representative Pompeo Questions EPA Administrator McCarthy on Obama Climate Plan,” *Globalwarming.Org*, September 18, 2013, <http://www.globalwarming.org/2013/09/18/rep-pompeo-questions-epa-administrator-mccarthy-on-obama-climate-plan/>

¹¹⁶ 82 FR 48045

TABLE 2—AVOIDED COMPLIANCE COSTS, FORGONE DOMESTIC CLIMATE BENEFITS, AND NET BENEFITS OF REPEAL ASSOCIATED WITH TARGETED POLLUTANT, BASED ON THE 2017 ANNUAL ENERGY OUTLOOK
(Billions of 2011\$)

Year	Discount rate (%)	Avoided compliance costs	Forgone domestic climate benefits	Net benefits associated with targeted pollutant
2020	3	(\$0.3)	\$0.1	(\$0.4)
	7	0.0	(0.3)
2025	3	14.5	1.3	13.2
	7	0.2	14.3
2030	3	14.4	2.5	11.9
	7	0.4	14.0

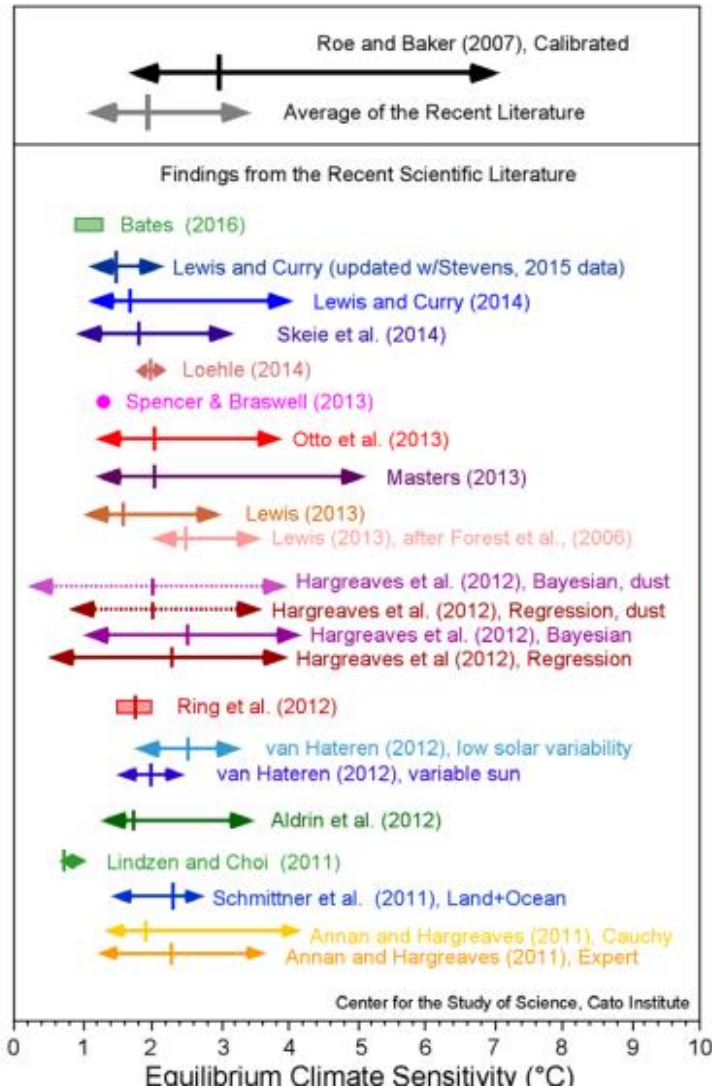
Note: Estimates are rounded to one decimal point and may not sum due to independent rounding.

F. Additional Correction: Use Updated Sensitivity Estimates

However, much room for improvement remains. As noted, a key variable in SC-CO₂ estimation is equilibrium climate sensitivity—the long-term warming after a doubling of atmospheric CO₂ concentration. The draft RIA uses a likely range and best estimate of climate sensitivity developed in 2007 (Roe and Baker).¹¹⁷ Many recent studies indicate a substantially lower sensitivity. As explained by Cato Institute scientist Patrick Michaels, “Whereas the [Roe-Baker] ECS distribution has a median value of 3.0°C and 5th and 95th percentile values of 1.72°C and 7.14°C, respectively, the corresponding values averaged from the recent scientific literature are ~2.0°C (median), ~1.1°C (5th percentile), and ~3.5°C (95th percentile).”¹¹⁸ See the chart below.

¹¹⁷ Gerald H. Roe and Marcia B. Baker, “Why Is Climate Sensitivity So Unpredictable,” *Science* 26 Oct 2007: Vol. 318, Issue 5850, pp. 629-632, <http://science.sciencemag.org/content/318/5850/629>

¹¹⁸ Written statement of Patrick J. Michaels, Director, Center for the Study of Science, Cato Institute, Hearing on: At What Cost? Examining the Social Cost of Carbon, House Committee on Science, Space, and Technology, February 28, 2017, <https://science.house.gov/sites/republicans.science.house.gov/files/documents/HHRG-115-SY18-WState-PMichaels-20170228.pdf>



In late December 2017, University of Alabama in Huntsville scientists John Christy and Richard McNider published a study estimating ECS at 1.46°C. Just this week, independent researchers Nic Lewis and Judith Curry published a study in the *Journal of Climate* estimating an ECS of about 1.50-1.56°C.¹¹⁹

Lower climate sensitivity means smaller climate impacts. Combining updated sensitivity estimates with the aforementioned accounting corrections yields much smaller SC-CO₂ values, in some models even producing negative SC-CO₂ values (indicating net benefits), as shown in the chart below.¹²⁰

¹¹⁹ Patrick J. Michaels, "Some More Insensitivity about Global Warming," Cato at Liberty, April 25, 2018, <https://www.cato.org/blog/some-more-insensitivity-about-global-warming>

¹²⁰ Congressional testimony of Kevin D. Dayaratna, Senior Statistician and Research Programmer, Heritage Foundation, Hearing on: At What Cost? Examining the Social Cost of Carbon, House Committee on Science, Space,

TABLE 5

FUND Model Average SCC – ECS Distribution Updated in Accordance with Lewis and Curry (2015), End Year 2300

Year	Discount Rate - 2.50%	Discount Rate - 3%	Discount Rate - 5%	Discount Rate - 7%
2010	\$5.25	\$2.78	-\$0.65	-\$1.12
2020	\$5.86	\$3.33	-\$0.47	-\$1.10
2030	\$6.45	\$3.90	-\$0.19	-\$1.01
2040	\$7.02	\$4.49	-\$0.18	-\$0.82
2050	\$7.53	\$5.09	\$0.64	-\$0.53

SOURCE: Kevin Dayaratna, Ross McKittrick, and David Kreutzer, "Empirically-Constrained Climate Sensitivity and the Social Cost of Carbon," *Climate Change Economics*.

 heritage.org

G. Additional Correction: Shun Structurally-Biased IAMs

The Obama administration used three models, known in the trade as DICE, FUND, and PAGE to guesstimate the SC-CO₂.¹²¹ The PAGE and DICE models include virtually no agricultural and economic benefits from the CO₂-fertilization effect. Yet literally thousands of laboratory and field investigations show that rising CO₂ concentrations enable the vast majority of plants to grow faster and larger, use water more efficiently, and resist environmental stresses.¹²²

The FUND model includes CO₂ fertilization benefits, but those are based on studies from two decades ago and are arguably too low.¹²³ Recent satellite studies find that CO₂ emissions are literally greening the planet. For example, NASA satellite data show that since 1982, global leaf area index (LAI) increased by an area twice the size of the continental United States, with 70 percent of the increase attributed to CO₂ emissions.¹²⁴ Another study finds that LAI increased by 11 percent in the world's

and Technology, February 28, 2017, <http://docs.house.gov/meetings/SY/SY18/20170228/105632/HHRG-115-SY18-Wstate-DayaratnaK-20170228.pdf>

¹²¹ The acronyms stand for Dynamic Integrated Climate Economy (DICE), Framework for Uncertainty, Negotiation and Distribution (FUND), and Policy Analysis of the Greenhouse Effect (PAGE).

¹²² Craig D. Idso (USA), Sherwood B. Idso (USA), Robert M. Carter (Australia), S. Fred Singer (USA), Lead Authors/Editors, *Climate Change Reconsidered II: Biological Impacts*, Nongovernmental International Panel on Climate Change, April 9, 2014, <http://climatechangereconsidered.org/climate-change-reconsidered-ii-biological-impacts/>

¹²³ Personal conversation with Kevin D. Dayaratna, Heritage Foundation Senior Statistician and Research Programmer, March 12, 2018

¹²⁴ Zhu et al. Greening of the Earth and its Drivers. *Nature Climate Change*, Vol. 6, 25 April 2016, <https://www.nature.com/articles/nclimate3004>

deserts.¹²⁵ A third study finds that plants are converting 31 percent more CO₂ into organic matter than they were before the Industrial Revolution and growing at faster rates than at any other time in the past 54,000 years.¹²⁶

Of particular relevance to SC-CO₂ analysis, climate researcher Craig Idso, using Food and Agriculture Organization economic data on 45 major crops and plant-specific CO₂-growth response data, estimates that during 1961-2011, rising concentrations boosted global crop production by \$3.2 trillion. He projects the ongoing rise in concentration will add another \$9.8 trillion to agricultural output by 2050.¹²⁷

SC-CO₂ estimation models that lack significant CO₂ fertilization benefits are structurally biased. Such models flunk the federal Information Quality Act (Pub. L. 106-554), which aims to “ensure and maximize” the “quality, objectivity, utility, and integrity” of agency-disseminated information.¹²⁸ Biased models should not be used in official regulatory analysis.

H. Eschew the Pretense of Knowledge and Precision

IAMs may have a role in academic research, allowing analysts to see how different physical and economic assumptions drive estimates of climate-related impacts and regulatory benefits. However, using IAMs to make policy “suggests a level of knowledge and precision that is simply illusory, and can be highly misleading,” MIT professor Robert Pindyck cautions.¹²⁹ He explains:

The modeler has a great deal of freedom in choosing functional forms, parameter values, and other inputs, and different choices can give wildly different estimates of the SCC [social cost of carbon] and the optimal amount of abatement. You might think that some input choices are more reasonable or defensible than others, but no, “reasonable” is very much in the eye of the modeler. Thus these models can be used to obtain almost any result one desires.¹³⁰

¹²⁵ Randall J. Donohue, Michael L. Roderick, Tim R. McVicar, and Graham D. Farquhar, Impact of CO₂ fertilization on maximum foliage cover across the globe’s warm, arid environments, *Geophysical Research Letters*, Vol. 40, 1–5, https://friendsofscience.org/assets/documents/CO2_Fertilization_grl_Donohue.pdf

¹²⁶ J. E. Campbell, J. A. Berry, U. Seibt, S. J. Smith, S. A. Montzka, T. Launois, S. Belviso, L. Bopp & M. Laine, Large historical growth in global terrestrial gross primary production, *Nature* volume 544, pages 84–87, <https://www.nature.com/articles/nature22030>

¹²⁷ Craig I. Idso, *The Positive Externalities of Carbon Dioxide: Estimating the Monetary Benefits of Rising Atmospheric CO₂ Concentrations on Global Food Production*, October 2013, <http://www.co2science.org/education/reports/co2benefits/co2benefits.php>

¹²⁸ Office of Management and Budget, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies; Notice; Republication, 67 FR 8452-8460, February 22, 2002, <https://www.gpo.gov/fdsys/pkg/FR-2002-02-22/pdf/R2-59.pdf>

¹²⁹ Robert Pindyck, Climate Change Policy: What Do Models Tell Us? Working Paper 19244, July 2013, <http://www.nber.org/papers/w19244>

¹³⁰ *Ibid.*, p. 5

What climate campaigners and their agency allies typically desire is to sustain the narrative that climate change is “worse than we thought.” For example, the central SC-CO₂ estimates in the Obama administration’s 2013 technical support document (TSD) are almost 60 percent higher than the corresponding estimates in the administration’s 2010 TSD.¹³¹ In four short years, the cumulative impacts of climate change out to 2300 somehow became almost 60 percent more harmful!

Table 1: Central Values for the Social Cost of Carbon Estimates Issued by the Interagency Working Group on Social Cost of Carbon in 2010 and 2013

Dollars are 2007 dollars per metric ton of carbon dioxide

Year	2010 central values	2013 central values
2010	\$21	\$32
2020	26	43
2030	33	52
2040	39	61
2050	\$45	\$71

Source: Interagency Working Group on Social Cost of Carbon’s Technical Support Document and 2013 update. | GAO-14-663

Raise the SC-CO₂ estimate high enough, and modelers can make fossil fuels look unaffordable no matter how cheap and renewable energy look like a bargain at any price. In political practice, SC-CO₂ analysis is computer-aided sophistry.¹³²

President Trump made the right call when he disbanded the Obama administration’s Interagency Working Group on the Social Cost of Carbon.¹³³ Requiring government-wide endorsement of specific SC-CO₂ values is useful only for promoting groupthink, flimflam, and regulatory overreach.

We are aware of that in *Center for Biological Diversity v. National Highway Traffic Safety Administration* (2007), the Ninth Circuit Court of Appeals ordered NHTSA to monetize the CO₂ reduction benefits of fuel economy standards. The Court argued that “while the record shows that there is a range of values, the value of carbon emissions

¹³¹ U.S. Government Accountability Office, Regulatory Impact Analysis: Development of Social Cost of Carbon Estimates, July 2014, p. 7, <https://www.gao.gov/assets/670/665016.pdf>

¹³² A revealing example is Laurie Johnson, Starla Yeh, and Chris Hope, “The Social Cost of Carbon: Implications for Modernizing Our Electricity,” *Journal of Environmental Studies and Sciences*, December 2013, Volume 3, Issue 4, pp. 369–375, <https://link.springer.com/article/10.1007/s13412-013-0149-5>. Using a 1 percent discount rate, the authors estimate that in 2010 the SC-CO₂ was already \$266/ton, which supposedly makes new renewable generation more “efficient” than either new gas or existing coal generation.

¹³³ Presidential Executive Order on Promoting Energy Independence and Economic Growth, March 27, 2018, <https://www.whitehouse.gov/presidential-actions/presidential-executive-order-promoting-energy-independence-economic-growth/>

reduction is certainly not zero.”¹³⁴ In fact, as noted above, under some reasonable assumptions, SC-CO₂ values are negative, which implies CO₂ emissions produce net benefits.¹³⁵

At one point, the Court chided NHTSA because the “value of carbon emissions reduction is nowhere accounted for in the agency’s analysis, whether quantitatively or qualitatively.” Perhaps then EPA should offer the “qualitative” assessment that physical and economic uncertainties render quantification of CO₂-reduction benefits “simply illusory” and “highly misleading.” Courts have no authority to demand false certitudes from agencies. EPA should resist demands to put an official stamp on particular SC-CO₂ estimates.

If courts refuse to defer to the agency’s expertise, EPA should draw the line at providing a range of SC-CO₂ values based on plausible alternative assumptions. Here is one such assessment: If, as considerable evidence suggests, climate sensitivity is at the low end of the IPCC range, natural gas continues to replace large amounts of coal in electric generation, new technologies continue to improve mankind’s adaptive capabilities, and CO₂ emissions continue to boost agricultural productivity, “the social benefits of lukewarming” will likely exceed the social costs of carbon.¹³⁶

2. PM_{2.5} Co-Benefits

A. EPA’s Proposed Revisions

Collateral reductions in conventional air pollutant emissions account for substantial portions of the CPP’s estimated benefits in 2030. For example, assuming a 3 percent discount rate, air pollution “co-benefits” account for \$14 billion to \$34 billion (41-62 percent) of total CPP benefits in 2030.¹³⁷ The lion’s share of those health co-benefits come from reduced levels of fine particulate matter—particles with a diameter of 2.5 micrometers or less (PM_{2.5}). Supposedly, the CPP’s coincidental PM_{2.5} reductions will avert nearly 3,600 premature deaths and 1,700 heart attacks in 2030.¹³⁸

Such estimates assume there is no threshold concentration below which PM_{2.5} does not kill people. In other words, PM_{2.5} is deemed to be deadly at any level above zero. That “linear-no-threshold” (LNT) assumption has not been validated, conflicts with

¹³⁴ *Center for Biological Diversity v. National Highway Traffic Safety Administration*, December 15, 2007, <http://caselaw.findlaw.com/us-9th-circuit/1024716.html>

¹³⁵ A further implication, for those who believe governments are wise enough to measure and virtuous enough to correct unpriced externalities, is that CO₂ emissions should be subsidized rather than taxed. See Library of Economics and Liberty, “Arthur Cecil Pigou,” *The Concise Encyclopedia of Economics*, <http://www.econlib.org/library/Enc/bios/Pigou.html>

¹³⁶ Patrick J. Michaels, Comments on the Fourth National Assessment, February 1, 2018, <https://object.cato.org/sites/cato.org/files/pubs/pdf/pat-michaels-national-climate-assessment.pdf>

¹³⁷ EPA, RIA 2015, ES-21

¹³⁸ EPA, Fact Sheet: Clean Power Plan Benefits of a Cleaner, More Efficient Power Sector, <https://archive.epa.gov/epa/cleanpowerplan/fact-sheet-clean-power-plan-benefits-cleaner-more-efficient-power-sector.html>

considerable evidence, and flouts the basic toxicological maxim that “the dose makes the poison.”

EPA’s draft RIA proposes to recalculate the CPP’s PM_{2.5} co-benefits using two “cutpoints” below which further reductions are not assumed to save additional lives. One cutpoint is the current national ambient air quality standard for PM_{2.5}, which is 12 micrograms per cubic meter (12 µg/m³). The repeal proposal does not explain the rationale for using the NAAQS as a cutoff, but we can readily supply it.

NAAQS must be set at a level “requisite to protect public health” with an “adequate margin of safety.”¹³⁹ That is already a precautionary standard. Consequently, the health benefits of PM_{2.5} reductions below the NAAQS are too uncertain to be assigned a dollar value.

As explained in the most recent NAAQS rulemaking for PM_{2.5}, EPA sets the standard at the point where its “confidence in the magnitude and significance of the associations is reduced to such a degree that a standard set at a lower level would not be warranted to provide requisite protection that is neither more nor less than needed to provide an adequate margin of safety.”¹⁴⁰ If the science does not support a more stringent standard, then EPA can have no confidence in the monetary value of reductions below the NAAQS.¹⁴¹

The second cutpoint is the lowest measured level (LML) in epidemiological studies used to derive the concentration response function between PM_{2.5} and mortality (8 and 5.8 µg/m³). The apparent rationale here is that EPA should not assume mortality effects at concentrations below the lowest levels at which epidemiological researchers purport to find correlations between PM_{2.5} exposure and mortality.

The draft RIA recalculates PM_{2.5} co-benefits using the two cutpoints, a 3 percent discount rate, and updated economic data from the Energy Information Administration’s *Annual Energy Outlook*. The draft RIA and CPP estimates differ as follows. Under the CPP’s LNT assumption, PM_{2.5} co-benefits are \$22.6 billion to \$44.9 billion in 2030. Under the no-mortality-effects-below-LML assumption, PM_{2.5} co-benefits are \$19.3 billion to \$25.8 billion in 2030. Under the no-mortality-effects-below-NAAQS assumption, PM_{2.5} co-benefits are \$4.0 billion to \$7.3 billion in 2030. When the analysis uses the NAAQS cutpoint, the benefits of repeal—i.e. the avoided compliance costs—exceed foregone CPP health benefits by \$7.1 billion to \$10.4 billion.¹⁴²

B. Additional Reasons to Discount PM_{2.5} Co-Benefits

¹³⁹ CAA section 109

¹⁴⁰ EPA, National Ambient Air Quality Standards for Particulate Matter; Final Rule, 78 FR 3161, January 15, 2013, <https://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf>

¹⁴¹ Anne E. Smith, “Inconsistencies in Risk Analyses for Ambient Air Pollutant Regulations,” *Risk Analysis*, Volume 36, Issue 9, September 2016, Pages: 1737–1744, <http://onlinelibrary.wiley.com/doi/10.1111/risa.12517/full>

¹⁴² 82 FR 48027

Although it is intuitively plausible that breathing “dirty air” shortens life, there is no direct empirical evidence that inhaling PM_{2.5} *at today’s historically-low levels* in the United States kills anyone. The alleged PM_{2.5} death toll is inferred from epidemiological studies, which attempt to discern causal connections in statistical associations between exposures and mortality in different cities and population groups. For several reasons, such studies are a dubious basis for estimating either PM_{2.5} health risks or the benefits of PM_{2.5} reductions.¹⁴³

- Epidemiology is a form of survey research. It discovers correlations that may or may not have a causal basis. Epidemiology is more likely to find causal connections in cases where pathogen exposures correlate strongly to relatively rare health conditions or events.¹⁴⁴ However, epidemiology finds only weak correlations between PM_{2.5} exposures and mortality from common causes of death such as cardiopulmonary disease.
- Unlike clinical trials, the actual PM_{2.5} exposures of persons surveyed in epidemiological studies are unknown. Individuals living in the same city may have very different PM_{2.5} exposures due to differences in neighborhood, indoor air pollution, occupation, physical activity, etc.
- Epidemiologists attempt to identify and control for confounding variables that may also affect health and life expectancy, such as pre-existing medical conditions, personal habits, obesity, weather conditions, and exposure to other pollutants including indoor air contaminants. Such factors may not be known completely even to the subjects themselves or their personal physicians.
- Regulatory agencies are the largest funder of air pollution epidemiology, so researchers have incentives to find results that support new or more stringent regulation. Unsurprisingly, the literature exhibits publication bias (publishing studies that find correlations between PM_{2.5} levels and mortality, not those that find no correlation) and data mining (tweaking models to maximize effects researchers expect or want to find).
- EPA’s PM_{2.5} regulations rest largely on two studies conducted in the 1990s—the so-called Harvard Six Cities study headed by D.W. Dockery¹⁴⁵ and an American Cancer Society cohort study (CPS II) headed by C. Arden Pope.¹⁴⁶ Despite

¹⁴³ For a more detailed discussion, see Joel M. Schwartz and Steven F. Hayward, *Air Quality in America: A Dose of Reality on Air Pollution Levels, Trends, and Health Risks* (Washington, DC: AEI Press, 2007), pp. 121-136,

<http://www.globalwarming.org/wp-content/uploads/2012/06/Schwartz-Hayward-Air-Quality-in-America.pdf>

¹⁴⁴ Steve Milloy, *Scare Pollution: Why and How to Fix the EPA* (USA: Bench Press, 2017), pp. 6, 16

¹⁴⁵ D. W. Dockery, C. A. Pope III, X. Xu, et al., “An Association Between Air Pollution and Mortality in Six U.S. Cities,” *New England Journal of Medicine* 329 (1993): 1753–59,

<http://www.nejm.org/doi/full/10.1056/NEJM199312093292401>

¹⁴⁶ Pope, Thun, Namboodiri, et al., “Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults,” *Am J Respir Crit Care Med* Vol 151. pp 669-674, 1995,

<https://www.ncbi.nlm.nih.gov/pubmed/7881654>

repeated requests from Congress and promises by former EPA administrator Gina McCarthy, the authors still refuse to make their data available to independent researchers.¹⁴⁷ Such “secret science” does not deserve the confidence of either EPA or the public. Indeed, agencies should not be allowed to regulate based on data that cannot be cross-examined by independent experts.

- Unlike epidemiological studies, laboratory studies with animals and clinical trials with humans “produce direct evidence for cause-effect relationships through random selection and assignment of subjects.”¹⁴⁸ In their comprehensive review of “inhalation studies using concentrated ambient particles, diesel engine exhaust particulate matter, and sulfate and nitrate salts,” toxicologists Laura Green and Sarah Armstrong report that “Toxicologic data on typical forms of pollution-derived PM strongly suggest that current ambient concentrations in the U.S. are too small to cause significant disease or death.”¹⁴⁹

Finally, EPA should examine recent studies that find no PM_{2.5} mortality effects at today’s historically low levels. A 2017 reanalysis of the American Cancer Society study by UCLA epidemiologist James Enstrom finds “No significant relationship between PM_{2.5} and total mortality in the CPS II cohort . . . when the best available PM_{2.5} data were used.” Enstrom contends that Pope’s finding of a “positive association” is due to “selective use” of both cohort and PM_{2.5} data.¹⁵⁰

California has the largest number of PM_{2.5} non-attainment areas in the country.¹⁵¹ In a 2017 study, statistician S. Stanley Young and two colleagues analyze large datasets for air quality and mortality in California during 2000-2012. Specifically, they examine more than 2 million deaths in eight air basins for possible PM_{2.5} associations on more than 37,000 exposure days.¹⁵² The researchers find no effect of PM_{2.5} on mortality. In their words:

In this paper we examine daily death data for the eight most populous air basins in California for associations with air quality. We found no associations using regression-based time series analysis. Extensive sensitivity analyses found air

¹⁴⁷ House Science, Space, and Technology Committee, “Investigation into EPA’s Secret Science,”

<https://science.house.gov/issues/committee-investigation-epas-secret-science>

¹⁴⁸ Schwartz and Hayward, p. 123

¹⁴⁹ Laura C. Green and Sarah R. Armstrong, “Particulate matter in ambient air and mortality: toxicologic perspectives,” *Regulatory Toxicology and Pharmacology*, Volume 38, Issue 3, December 2003, Pages 326-335,

<https://www.sciencedirect.com/science/article/pii/S0273230003000990>

¹⁵⁰ James E. Enstrom, “Fine Particulate Matter and Total Mortality in Cancer Prevention Study Cohort Reanalysis,” *Dose-Response: An International Journal*, January-March 2017:1-12,

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5407529/pdf/10.1177_1559325817693345.pdf

¹⁵¹ EPA, 2012 Annual PM_{2.5} Designations (as of May 2017), accessed March 13, 2018,

<https://epa.maps.arcgis.com/apps/MapJournal/index.html?appid=a76e14f777de49baa5d32f5544c8e20b&webmap=fc297672dd074e4ab5b208aeb21fa52>

¹⁵² S. Stanley Young, Richard L. Smith, Keneth K. Lopiano, “Air quality and acute deaths in California, 2000-2012,” *Regulatory Toxicology and Pharmacology*, 88 (2017) 173-184, <https://junkscience.com/wp-content/uploads/2017/11/Young-2017-CA-data-RTP.pdf>

quality variables do not add to the predictive ability of the models examined. Even when the predictive ability is improved, the improvement is negligible relative to a model that only uses time of year. The form of the air quality variable that comes into models is inconsistent across basin/year combinations. In short, we were unable to find a consistent and meaningful relationship between air quality and acute death in any of the eight California air basins considered.¹⁵³

In a comment letter on President Trump's regulatory reform agenda,¹⁵⁴ Young lists "21 studies that found no effect of either PM_{2.5} or ozone on deaths, acute or chronic effects."¹⁵⁵ In a separate memorandum, Young, Enstrom, and seven other experts challenge the plausibility of Pope's findings:

It is implausible that a never-smoker's death could be caused by inhalation over an 80-year lifespan of about one teaspoon (~5 grams) of invisible fine particles as a result of daily exposure to 15 µg/m³. This level of exposure is equivalent to smoking about 100 cigarettes over a lifetime or 0.004 cigarettes per day, which is the level often used to define a never-smoker. The notion that PM_{2.5} causes premature death becomes even more implausible when one realizes that a person who smokes 0.2 cigarettes/day has a daily exposure of about 750 µg/m³. If a 10 µg/m³ increase in PM_{2.5} actually caused a 0.61-year reduction in life expectancy, equivalent to the claim of Pope, then a 0.2 cigarettes/day smoker would experience about a 45-year reduction in life expectancy, assuming a linear relationship between changes in PM_{2.5} and life expectancy. In actuality, never-smokers and smokers of 0.2 cigarettes/day do not experience any increase in total death rate or decrease in life expectancy, in spite of a 50-fold greater exposure to PM_{2.5}.¹⁵⁶

In light of the foregoing, EPA should not assume PM_{2.5} is currently responsible for any premature mortality in the United States. If courts refuse to defer to EPA's expertise, the agency should estimate PM_{2.5} co-benefits under a third cutpoint: 15 µg/m³, the NAAQS EPA promulgated in 1997 and renewed in 2006.¹⁵⁷

Part VII: Conclusion

The Clean Power Plan is unlawful for all the reasons outlined in the repeal proposal plus others described in this comment letter. Significantly, those additional reasons suggest

¹⁵³ Ibid., p. 181

¹⁵⁴ The President, Executive Order 13777 of February 24, 2017, Enforcing the Regulatory Reform Agenda, 82 FR 12285-12287, <https://www.gpo.gov/fdsys/pkg/FR-2017-03-01/pdf/2017-04107.pdf>

¹⁵⁵ S. Stanley Young, PhD, FASA, FAAAS, Comment Letter on Executive Order 13777, "Enforcing the Regulatory Reform Agenda," Docket ID No. EPA-HQ-OA-2017-0190, <file:///C:/Users/marlowe/Desktop/Downloads/Comment.pdf>

¹⁵⁶ James E. Enstrom, S. Stanley Young, John Dale Dunn, Charles G. Battig, William M. Briggs, Edward J. Calabrese, Alan Carlin, Laurence I. Gould, Peter W. Wood, "Particulate Matter Does Not Cause Premature Deaths," August 17, 2015

¹⁵⁷ EPA, Particulate Matter (PM) Standards – Table of Historical PM NAAQS, https://www3.epa.gov/ttn/naaqs/standards/pm/s_pm_history.html

that any replacement rule imposing CO₂ performance standards on existing power plants would also be unlawful.

The CPP not only invades a traditional zone of state responsibility by controlling intrastate electricity markets, as the repeal proposal recognizes, it also undermines the interstate policy competition enabling citizens to vote with their feet against anti-growth regulatory and tax policies. In addition, the CPP would implement a policy shift of immense economic and political magnitude without clear congressional authorization.

The repeal proposal's draft RIA commendably scales back the CPP's inflated climate and health benefits. However, EPA should go much further to challenge the intellectual bona fides of the Obama administration's social cost of carbon dioxide estimates and PM_{2.5} co-benefit estimates. EPA should eschew the previous administration's pretense of knowledge and simply acknowledge that physical and economic uncertainties render quantification of CO₂-reduction benefits illusory and misleading. Finally, EPA should review the significant body of evidence indicating that PM_{2.5} at today's historically-low levels is not responsible for any premature mortality in the United States.

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