April 26, 2018

<u>Docket ID No. EPA-HQ-OAR-2017-0355</u>

Re: Proposal to repeal the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (EGUs), commonly referred to as the Clean Power Plan (CPP), as promulgated on October 23, 2015.

We, the undersigned, submit the following comments in response to the Federal Register Notice "Proposal to repeal the Carbon Pollution Emission Guidelines for Existing Stationary Sources" (82 FR 48035). In deciding whether or not to repeal the Clean Power Plan (CPP), EPA must take into account the following scientific findings.

We present findings on the foregone benefits associated with potentially repealing the CPP and the estimated impacts of an alternative power plant carbon standard that is reportedly favored by some groups known as a narrow "inside the fenceline" or "at the source"-only approach that focuses primarily on making heat rate improvements at a source, known as Building Block 1 in the CPP.

The findings presented here illustrate a flaw in EPA's proposed legal interpretation of section 111(a) and 111(d), which is the sole basis upon which the proposed repeal rests, by demonstrating that a narrow "at the source"-only approach is estimated to result in only nominal national carbon dioxide (CO_2) emission reductions and an increase on sulfur dioxide (SO_2) emissions from the power sector compared to the CPP and a business as usual reference case with no power plant carbon standards, and therefore does not represent the "best system of emission reduction" (BSER).

EPA's proposed interpretation of section 111 comes down to two assertions – first, that the BSER must be applied only *at the source* and second, that Building Blocks 2 and 3 of the CPP, which apply to substituting electricity generation from coal-fired power plants with natural gas or renewable energy, cannot be the basis of the emissions standards. Neither of these assertions is supported or supportable.

The first assertion in and of itself does not advance EPA's argument. In its proposal to repeal the CPP, EPA recognizes that "operational changes" to a source fall within the scope of the BSER. Nowhere in the proposal, however, does the agency address the fact that, in practice, reducing utilization *at a source* is an operational change that utilities have used to reduce emissions. In fact, the proposal completely fails to address the ample CPP record, which demonstrates that managing and reducing utilization *at individual facilities* has long been integral to utilities' practices for complying with a number of Clean Air Act air pollution control programs.

The proposal also fails to recognize the actual function of Building Blocks 2 and 3 in establishing the CPP emissions standards. The proposal makes much of the distinction between the application of measures *at the source* and the action of owners and operators *at the source*, as if the application of measures, including reduced utilization, is undertaken by an agency other than the source's operator or operating system. Building Blocks 2 and 3 describe the substitution activity that is used to generate electricity to meet customer demand and represent the CPP's device for quantifying, in part, what degree of reduced utilization at affected sources is reasonable and appropriate. EPA's narrow "at the source"-only interpretation, including its exclusion of the considerations on which Building Blocks 2 and 3 are based, is contrived and arbitrary. Based on the results presented here, EPA's interpretation could actually undermine the regulatory purpose of section 111 by allowing for increased CO_2 emissions in some regions due to emissions rebound.

Any repeal of the CPP must be based on a reasonable, non-arbitrary analysis of the BSER that is unconstrained by the EPA's proposed narrow "at the source"-only approach and that compares the estimated impacts of this narrow approach to the current CPP. The foundational case law on the interpretation and application of "best system of emission reduction" states that in determining the ''best'' system, the EPA must also take into account ''the amount of air pollution'' reduced. *Sierra Club v. Costle*, 657 F.2d 298, 326 (D.C. Cir. 1981). It is in this context that our presentation of an analysis of the pollution emissions, air quality, health, and ecosystem benefits foregone with the proposed repeal of the CPP and the potential impacts of a narrow "at the source"-only approach applies and must be explicitly considered by the EPA in its attempts to justify the legality of the constrained BSER determination which is the basis of its proposed repeal of the CPP.

I. Determining the Best System of Emissions Reductions

A reasonable, non-arbitrary analysis of the BSER should include an analysis of the change in the amount of pollution emitted under the current CPP and potential alternatives along with a full accounting of associated benefits and costs. Such an analysis should include, either quantitatively or qualitatively, changes in emissions of all air pollutants (i.e., target and co-pollutants), changes in air quality, changes in associated health effects, and consequences for ecosystem health (e.g., water quality, soil quality, fish and wildlife health, and crop and tree growth). The analysis should also include a complete economic accounting of the monetized value of the full foregone benefits of a proposed CPP repeal and impacts of a potential replacement.

A. Change in Air Emissions

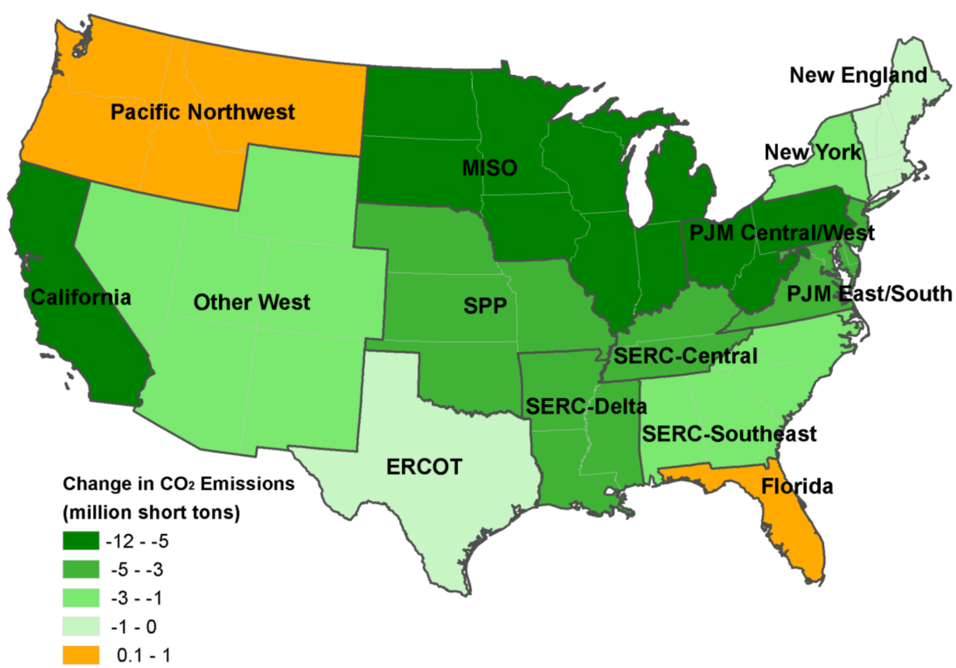
Standards limiting carbon dioxide (CO_2) emissions from existing power plants can also decrease emissions of non-carbon pollutants (co-pollutants) from the electric utility sector such as sulfur dioxide (SO_2), nitrogen oxides (NO_x), mercury (Hg), and directly emitted particulate matter (PM)(Thompson et al. 2014, Driscoll et al. 2015, Capps et al. 2016, Buonocore et al. 2016). As a result, the standards can produce changes in air quality, health outcomes, and environmental effects. The results from Driscoll et al. (2015) indicate that the magnitude and spatial distribution of these benefits or harms vary substantially and depend on the design of the power plant carbon standards based on different interpretations of the BSER.

Driscoll et al. (2015) evaluated three potential power plant carbon standards, including carbon standards similar to the CPP and standards that reflect an "inside the fence line" approach consistent with EPA's arbitrary interpretation of BSER as a narrow "at the source"-only approach. The results show major differences in total national annual emissions of CO_2 and co-pollutants. In Driscoll et al. (2015), the CPP-like option is referred to as "Scenario 2" and allows flexible compliance mechanisms such as switching to natural gas, switching to renewable energy, heat rate improvements at existing power plants, demand side energy efficiency, and emissions trading. The narrow "at the source"-only approach is referred to as "Scenario 1" and is limited to "inside the fenceline" measures such as heat rate improvements and co-firing at the unit with biomass or natural gas.

The analysis of the CPP-like option (Scenario 2) results in an estimated 35% reduction in total national CO_2 emissions from 2005 levels and a 23.6% reduction from a reference case with no power plant carbon standard in the year of full implementation (model year 2020 in this analysis). Scenario 2 also results in an estimated 27% reduction in SO_2 and mercury emissions, and a 22% reduction in NO_x emissions in 2020 compared to the reference case. As discussed below, these emissions reductions would result in air quality improvements and generate substantial health benefits in all of the lower 48 states included in the analysis.

By contrast, under a narrow "at the source"-only approach that is limited to inside the fenceline measures such as heat rate improvements and co-firing (Scenario 1), total national CO_2 emissions from the power sector are estimated to only decrease 2.2% from the reference case in 2020. A closer examination of the spatial patterns of estimated changes in CO_2 emissions reveals that, under Scenario 1, CO_2 emissions are projected to *increase* in two power sector regions compared to the reference case with this policy design that equal 800,000 short tons per year in the Pacific Northwest and 100,000 short tons per year in Florida (Figure 1; based on Driscoll et al. 2015).

Figure 1: Estimated changes in annual carbon dioxide emissions for an "at the source"-only approach to power plant carbon standards (Scenario 1) in 2020 relative to a reference case with no carbon standards. Positive values indicate an increase in CO_2 emissions and negative values indicate a decrease in CO_2 emissions. Based on Driscoll et al. 2015.



Scenario 1 also resulted in an estimated 3% decrease in total national NO_x emissions and a 3% *increase* in total national SO_2 emissions in 2020 compared to the reference case. As shown in more detail below, this increase in SO_2 emissions in 2020 results in a projected modest decline in air quality in some regions.

We examined power generation estimates for Scenario 1 and found that the projected increase in regional CO_2 emissions and national SO_2 emissions are due to emissions rebound compared to a business as usual scenario with no power plant carbon standards. Emissions rebound occurs when facilities that exhibit high emissions are made more efficient and therefore operate more frequently and for longer periods than in the reference case (Driscoll et al. 2015).

B. Change in Air Quality

Consistent with the changes in emissions, the results from Driscoll et al. (2015) show that a carbon standard similar to the CPP (Scenario 2) is estimated to improve air quality compared to the reference case within all states of the coterminous U.S. (Figure 2; Driscoll et al. 2015). The resulting improvements in fine particulate matter and ground-level ozone are shown in Figure 3 for 41 cities with populations greater than 330,000, representing cleaner air for 41 million Americans.

Figure 2: Estimated changes in (a) average annual concentrations of peak summertime O_3 and (b) average annual concentrations of $PM_{2.5}$ in 2020 for a power plant carbon standard similar to the Clean Power Plan (Scenario 2) in 2020 relative to a reference case with no power plant carbon standard. Negative values indicate a decrease in pollution over time compared to the reference case. These areas would experience commensurate increases in these pollutants under the proposed repeal. From Driscoll et al. 2015.

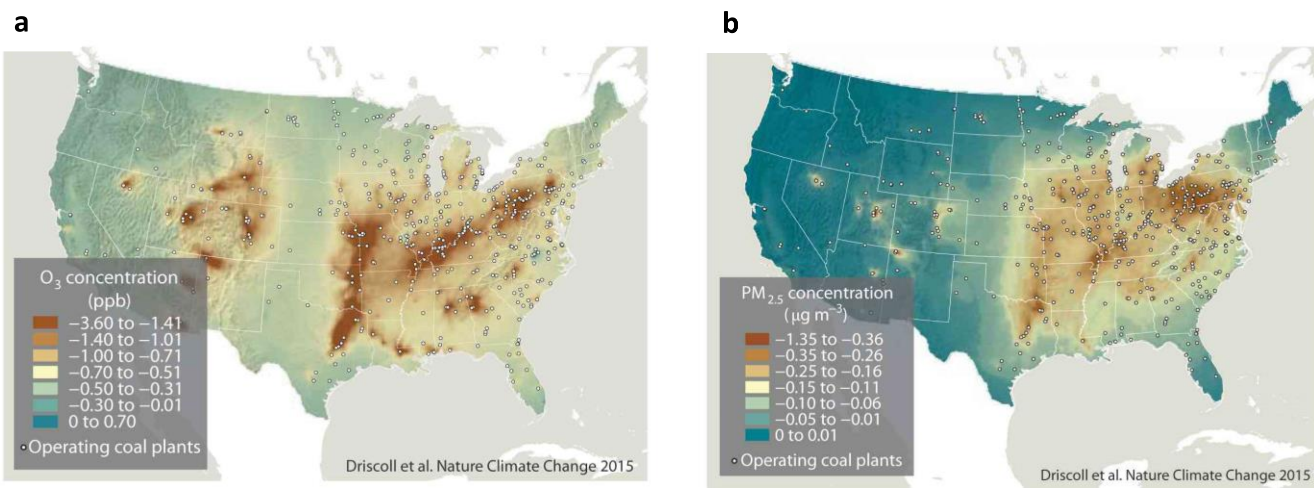
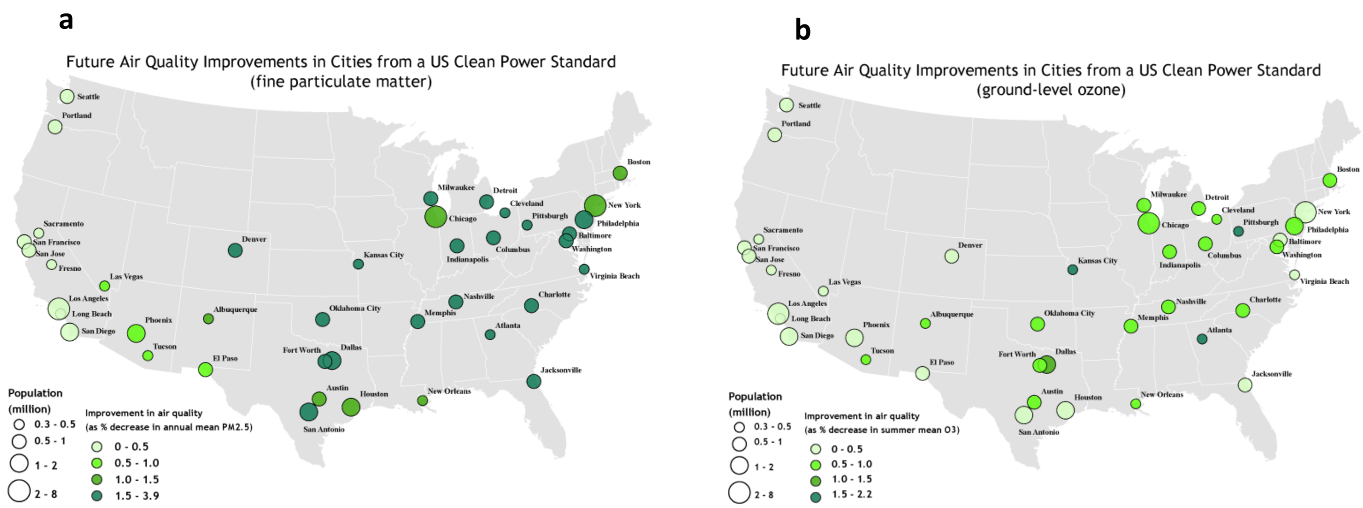
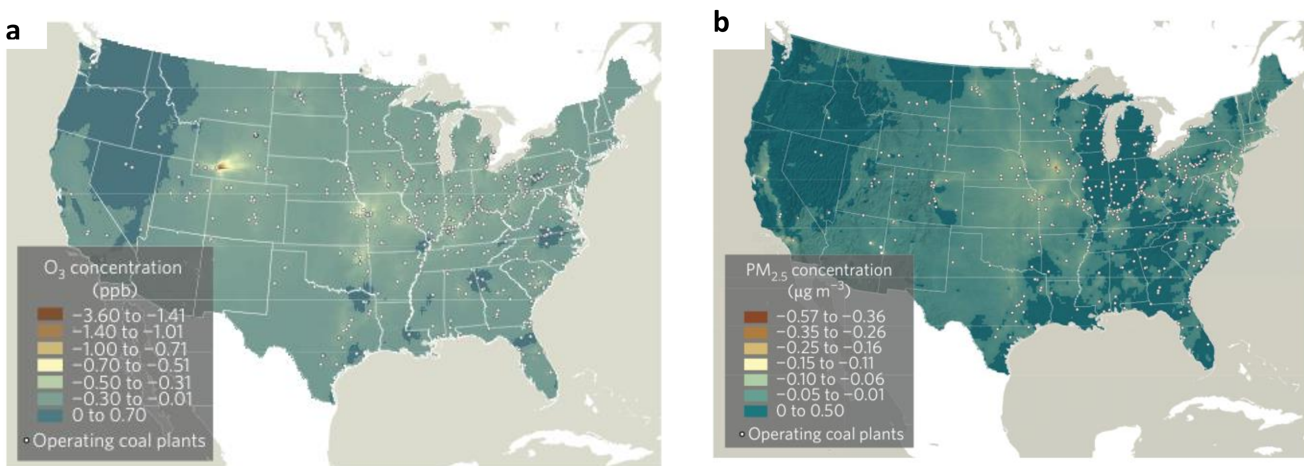


Figure 3: Estimated improvements in (a) average annual $PM_{2.5}$ and (b) peak summertime O_3 concentrations in 41 large cities for a power plant carbon standard similar to the Clean Power Plan (Scenario 2) in 2020 relative to a reference case with no carbon standards. Larger improvements in air quality are indicated by darker shades of green. The size of the circle indicates the population of that city. Based on Driscoll et al. 2015.



Conversely, the estimated emissions changes associated with the narrow "at the source"-only approach (Scenario 1) are projected to generate a modest *deterioration* in air quality compared to the reference case in many regions of the coterminous U.S. (Figure 4; Driscoll et al. 2015).

Figure 4: Estimated changes in (a) average annual concentrations of peak summertime O_3 and (b) average annual concentrations of $PM_{2.5}$ in 2020 for a narrow "at the source"-only power plant carbon standard (Scenario 1) in 2020 relative to a reference case with no power plant carbon standard. Positive values indicate an increase in pollution over time compared to the reference case. From Driscoll et al. 2015.



C. Health Effects

In addition to changes in emissions and air quality, an analysis of the BSER should include an evaluation of health effects including (but not limited to) those used in Driscoll et al. (2015). The results from Driscoll et al. (2015) show that estimated emissions reductions and air quality improvements associated with a power plant carbon standard similar to the CPP result in an estimated annual reduction of 3,500 premature deaths, 1,000 hospitalizations, and 220 heart attacks (central estimates), among other health outcomes relative to a business as usual reference case. Note that the estimated 3,500 premature deaths avoided in Driscoll et al. (2015) are lower than the estimate of 4,500 in the draft 2017 RIA for the proposed repeal because it is based on assumptions that are more reflective of the draft CPP and on an earlier reference case. These peer-reviewed results show that air quality and public health benefits in the form of premature deaths are avoided are expected to occur within areas in every U.S. state under carbon standards similar to the CPP (Figure 5 and Table 1).

By contrast, under the Scenario 1 alternative that employs a narrow "at the source"-only approach, the results indicate that there would be a total of 10 *additional* premature deaths per year nationally compared to the reference case in 2020 (Figure 6 and Table 2; Driscoll et al. 2015). The 10 additional premature deaths represent an estimated increase of 134 premature deaths in 16 states and the District of Columbia that are offset in part by a decrease of 123 premature deaths in 23 other states, with effectively no impact in the remaining states. The results estimate that this narrow "at the source"-only approach (Scenario 1) would have net adverse impacts on public health, and moreover, would contribute to the majority of states receiving either increased public health burdens or no benefits, in contrast with the CPP-like approach of Scenario 2 where all states are expected to gain some health benefits.

Together, the Driscoll et al. (2015) analysis of a range of power plant carbon standards underscores the importance of conducting a rational analysis of a potential CPP repeal and potential replacement options that compares the amount of pollution reduced or generated under each option using a multi-pollutant approach to determine the BSER. The research shows that a policy option that applies a scenario for EPA's overly narrow "at the source"-only approach can result in only modest decreases in total national emissions of CO_2, an *increase* in annual emissions of the target pollutant of CO_2 in some power regions, and an *increase* in total national emissions of SO_2 as a result of emissions rebound. The research shows that the estimated increase in SO_2 can be large enough to generate increased concentrations of ambient $PM_{2.5}$ with concomitant adverse health effects that vary in magnitude in different areas of the country (Driscoll et al. 2015). In other words, not only would a narrow "at the source"-only approach fall short of the public health benefits available through a more flexible compliance strategy like the CPP, but it could actually increase emissions and air pollution-related public health impacts relative to doing nothing at all.

<u>Figure 5: Premature deaths avoided for a power plant carbon standard similar to the Clean Power Plan (Scenario 2) in 2020 compared to a business as usual reference case with no power plant carbon standard. From Driscoll et al. 2015.</u>

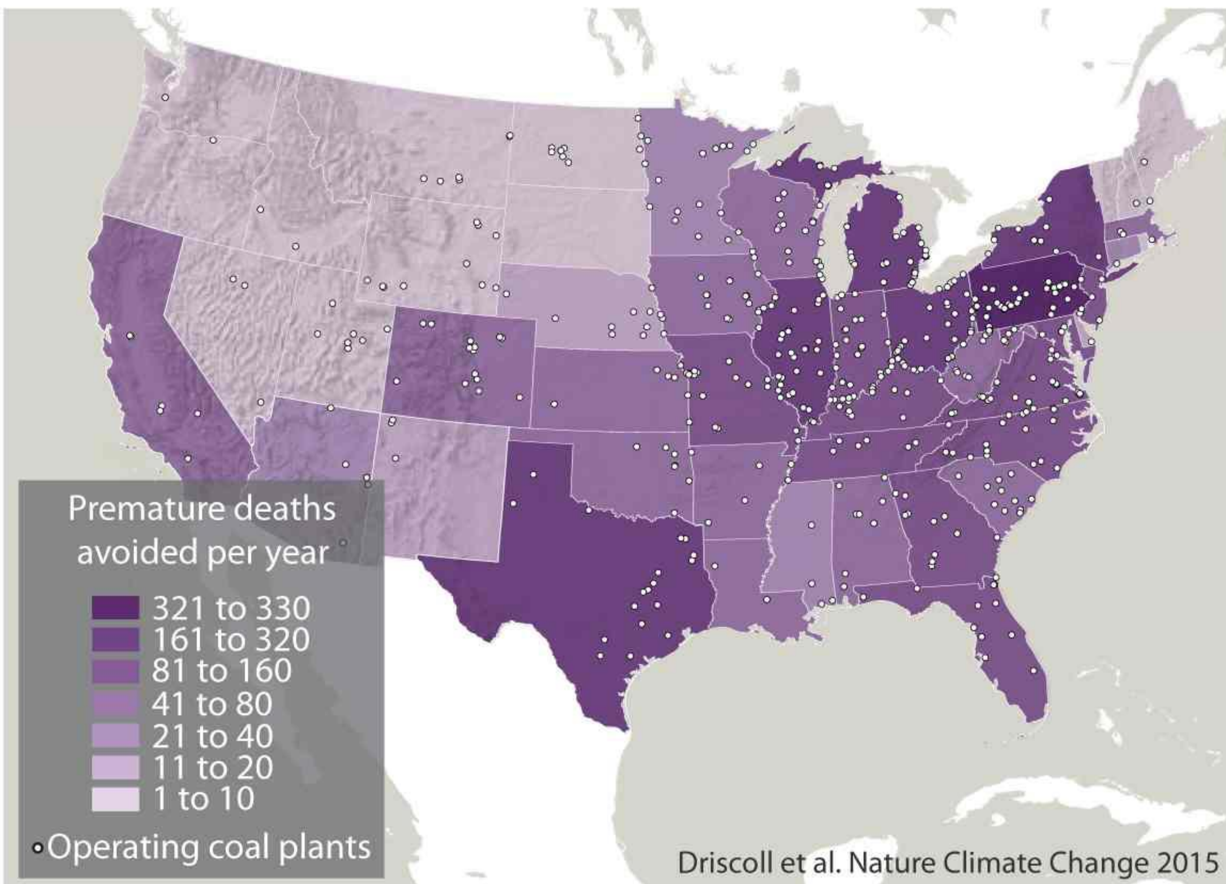


Figure 6: Premature deaths avoided for a power plant carbon a narrow "at the source"-only power plant carbon standard (Scenario 1) in 2020 compared to a business as usual reference case with no power plant carbon standard. From Driscoll et al. 2015.

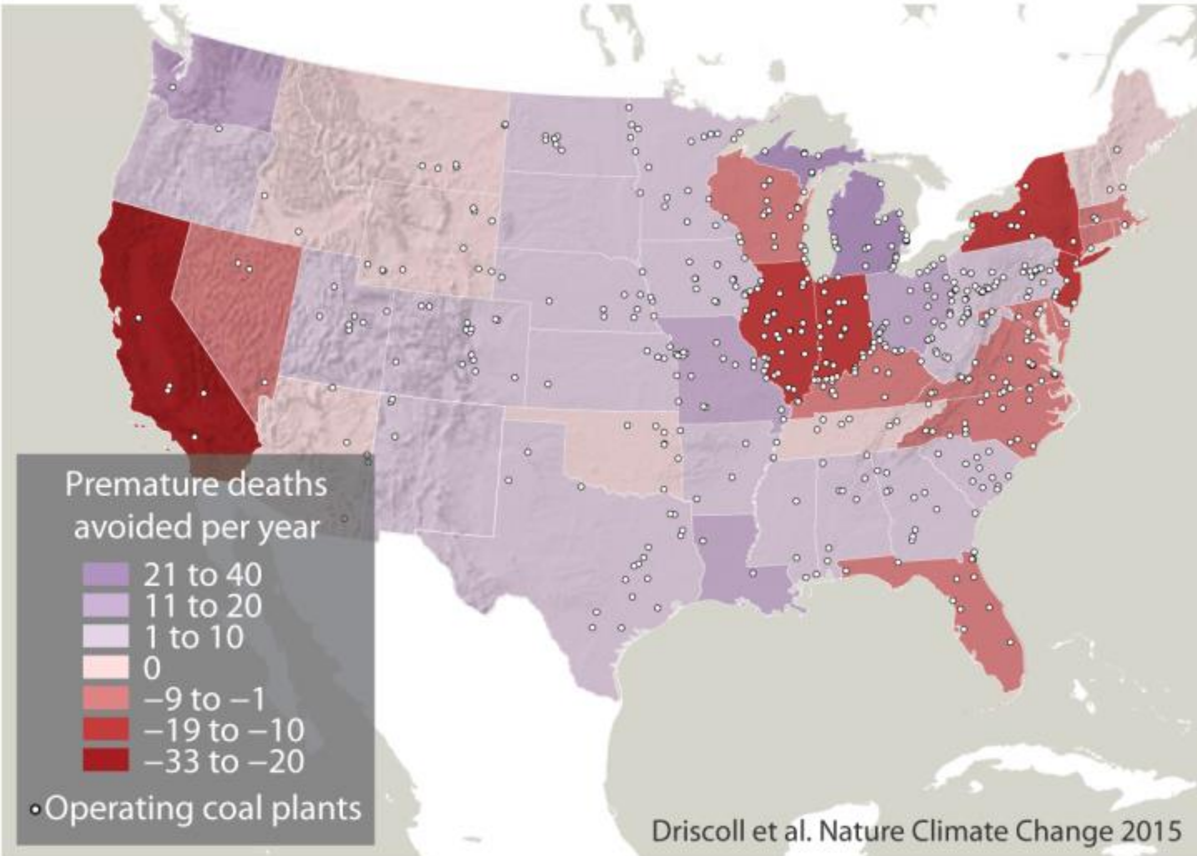


Table 1: Central estimates of change in health outcomes for power plant carbon standards similar to the Clean Power Plan (Scenario 2) in 2020 relative to a business as usual reference case with no standards. Positive values represent the number of cases avoided. From Driscoll et al. 2015.

State	Deaths avoided	Hospitalizations avoided	Heart attacks prevented
PA	330	71	19
OH	280	76	18
TX	230	79	14
IL	210	76	16
MI	190	45	13
NY	190	45	11
NC	130	37	8
GA	120	44	7
MO	120	31	7
VA	120	34	8
TN	120	39	8
IN	110	40	8
FL	110	38	6
NJ	110	27	7
MD	100	23	6
KY	86	39	6
AL	75	25	4
WI	74	17	4
CO	63	14	3
SC	62	19	4
OK	61	22	3
LA	58	18	3
CA	57	15	3
AR	57	21	4
MA	52	13	4
WV	49	18	4
IA	47	15	3
KS	43	15	2
MS	38	12	2
MN	34	9	2
CT	27	9	2
AZ	23	11	1
NE	18	6	1
DE	17	4	1
NM	14	7	1
RI	10	2	1
UT	9	3	0
DC	9	2	1
NH	7	2	1
ME	6	2	0
SD	5	3	0
NV	4	2	0
VT	4	1	0
WY	3	1	0
MT	2	1	0
WA	2	1	0
ND	2	1	0
ID	2	1	0
OR	1	0	0

Table 2: Central estimates of change in health outcomes for a narrow "at the source"-only power plant carbon standard (Scenario 1) in 2020 relative to a business as usual reference case with no standards. Positive values represent the number of cases avoided under the policy. Negative values represent the number of new cases generated by the policy. From Driscoll et al. 2015.

State	Deaths avoided	Hospitalizations avoided	Heart attacks prevented
MI	21	5	2
OH	15	6	1
LA	13	2	1
MO	12	4	1
WA	11	2	1
IA	8	3	0
TX	6	1	0
MN	5	2	0
KS	5	2	0
OR	5	1	0
NE	3	1	0
GA	3	0	0
AR	3	1	0
CO	2	1	0
ND	2	1	0
AL	2	0	0
SC	1	1	0
WV	1	1	0
SD	1	1	0
PA	1	1	0
UT	1	0	0
MS	1	0	0
NM	1	0	0
OK	0	1	0
WY	0	0	0
MT	0	0	0
ID	0	0	0
AZ	0	1	0
ME	0	0	0
VT	0	0	0
TN	0	0	0
NH	0	0	0
DC	-1	0	0
DE	-1	0	0
RI	-2	0	0
KY	-2	0	0
FL	-3	1	0
NC	-4	-2	0
NV	-4	-1	0
CT	-5	-1	0
VA	-5	-1	0
MD	-6	0	0
MA	-8	-2	-1
WI	-9	-1	-1
NJ	-12	-2	-1
IN	-12	-1	-1
IL	-13	1	-1
NY	-14	-3	-1
CA	-33	-10	-2

II. Accounting for Foregone Benefits in the Regulatory Impact Analysis

In considering repeal or revision of the CPP, the EPA Regulatory Impact Analysis (RIA) must account for the full foregone benefits to air quality, human health, and public welfare and the environment, as well as provide a full economic accounting of the monetized value of the full foregone benefits that may occur as a result of the action. The draft RIA falls far short of current standards, as discussed in more detail below.

A. RIA Estimates of Foregone Emissions Reductions

In considering a potential repeal of the CPP, the EPA must produce an RIA that provides additional information and an explanation for the estimated foregone emission reductions associated. The 2017 draft RIA, and the 2017 Annual Energy Outlook (AEO) on which it was based, suggest that SO_2 emissions reductions with the CPP would be 143,000 short tons greater in 2030 than previously estimated in the 2015 RIA from 2015 IPM model runs for a mass-based illustrative plan (Table 3). At the same time, the RIA for the proposed CPP repeal forecasts fewer CO_2 reductions associated with the CPP (Table 3). The muted CO_2 reductions appear to be based on larger forecasted decreases in coal production that are somewhat offset by substantial projected increases in natural gas generation (Table 3), however these assumptions are not well-documented in the draft 2017 RIA. The policy and technical assumptions and associated changes in electricity generation that drive the differences in both CO_2 and SO_2 emission reductions between the 2015 RIA for the CPP and the 2017 draft RIA for the proposed repeal of the CPP should be explained.

B. RIA Estimates of Foregone Health Benefits

The draft RIA for the proposed CPP repeal presents several different methods and assumptions for accounting for foregone health benefits, but does not clearly identify which method represents the proposed main case for estimated foregone benefits and which cases represent sensitivity cases. In considering a repeal or revision of the CPP the RIA should clarify the final methods and assumptions, and cite the appropriate scientific literature to justify the choices made.

The draft RIA for the proposed repeal of the CPP specifically asks for comments on "how best to use empirical data to quantitatively characterize the increasing uncertainty in $PM_{2.5}$ co-benefits that accrue to populations who live in areas with lower ambient concentrations" (RIA 2017, page 8). Those empirical data would be derived from epidemiological investigations of the health effects of exposure to lower ambient concentrations of $PM_{2.5}$. Importantly, recent research suggests those uncertainties are narrowing, not increasing. For example, the meta-analysis in Di et al. 2017a shows a narrowing of the uncertainty bounds around the hazard ratio for $PM_{2.5}$ exposure, even at low ambient concentrations.

Table 3: Clean Power Plan Repeal Regulatory Impact Analysis for Mass-based Illustrative Plan

		2015			2017		
Series	**Unit**	**CPP**	**No CPP**	**No CPP - CPP**	**CPP**	**No CPP**	**No CPP - CPP**
Coal generation	Thousand GWh	1,126	1,443	317	1,024	1,422	398
Gas generation	Thousand GWh	1,340	1,411	71	1,499	1,344	-155
Renewables generation	Thousand GWh	850	821	-29	1,114	1,031	-83
Total generation	Thousand GWh	4,110	4,467	357	4,442	4,603	161
Henry Hub Nat gas price	2016$/MMBtu	6.32	6.41	0.10	5.00	4.86	-0.14
CO2 emissions	Million short tons	1,814	2,227	413	1,694	2,078	384
SO2 emissions	Thousand short tons	1,034	1,314	280	934	1,357	423
NOx emissions	Thousand short tons	1,015	1,293	278	854	1,109	255

Note: Renewables include hydro.

Sources: 2015 RIA: https://19january2017snapshot.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf; 2017 AEO: https://www.eia.gov/outlooks/aeo/tables_side.php

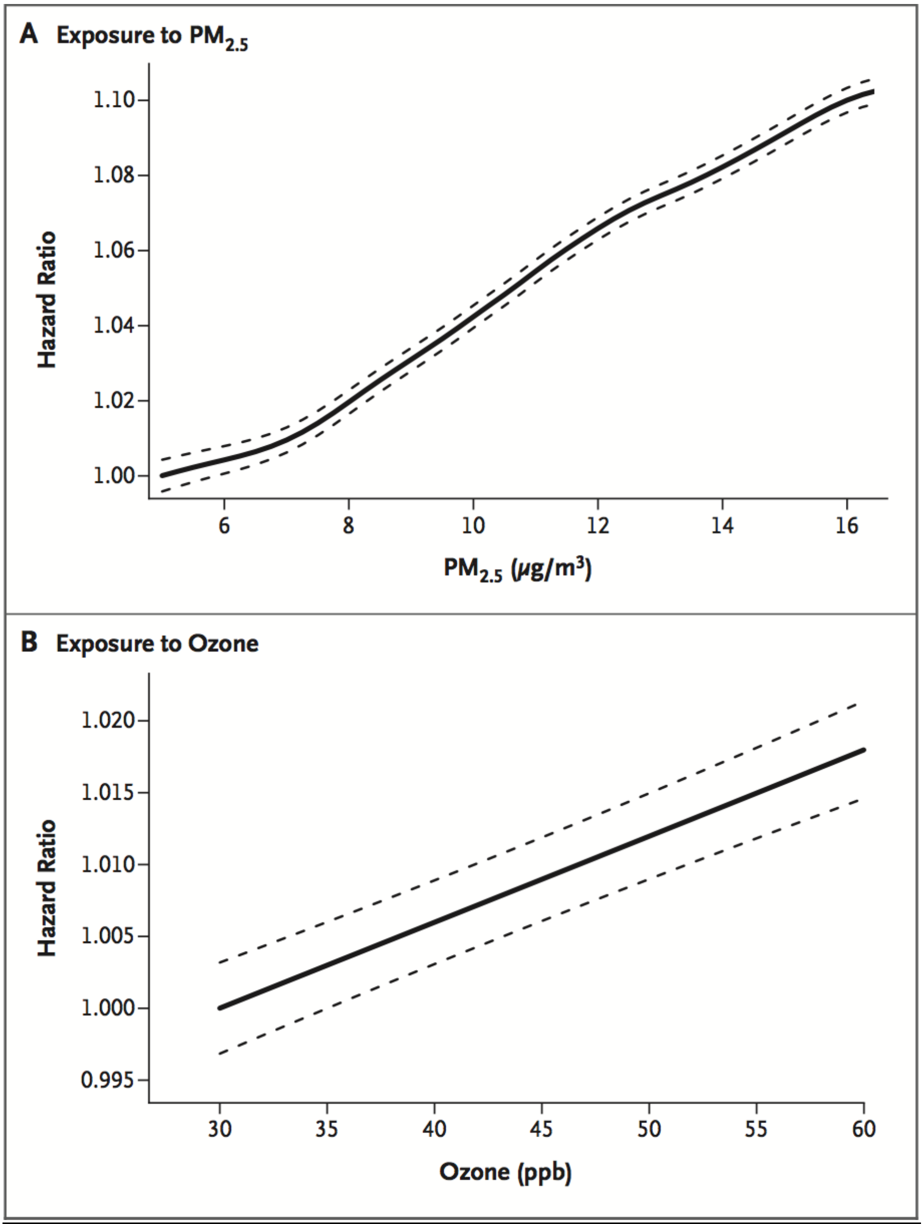
As scientific research on health effects of $PM_{2.5}$ expands, evidence for population level effects at concentrations below the annual NAAQS value of 12 µg/m^3 continues to grow (e.g., Di et al. 2017 a, b; Wang et al. 2017). Moreover, no evidence exists for a threshold at which $PM_{2.5}$ is considered safe. Recent studies looked for a threshold and did not find any evidence for a health effects threshold at 12 µg/m^3, or other annually averaged concentrations (e.g., Di et al. 2017 a, b; Wang et al. 2017). Therefore, foregone health benefits should be calculated using estimated health effects for the full range of values of $PM_{2.5}$ down to a value of 0 µg/m^3 rather than assuming that health effects fall to zero below the NAAQS or below a lowest measurable level

(LML) such as 5.8 μg/m^3. Stated another way, the most appropriate approach for characterizing uncertainty in co-benefits at lower ambient concentrations would be to consider the shape of the concentration-response function and associated uncertainties across relevant epidemiological investigations.

The overwhelming majority of published research shows that the shape of the concentration-response function for mortality effects from exposure to $PM_{2.5}$ is linear or log linear, with a recent study suggesting that the shape may have a slightly *steeper* slope at lower concentrations for adults 65 years of age and over. Di et al. 2017a used a dataset for 61 million people who were Medicaid beneficiaries from 2000 to 2012 from across the U.S. living in cities, suburban, and rural locations and who were subject to a wide range of air pollution exposures, providing 460 million person-years of follow-up. The study reports that the relationship between $PM_{2.5}$, ozone, and all-cause mortality is almost linear, with no signal of threshold down to 5 μg/m^3 and 30 ppb ozone. Further, they found a significant association between $PM_{2.5}$ exposure and mortality when the analysis was restricted to concentrations below 12 μg/m^3, with a steeper slope below that level (Figure 7). Accordingly, they report that the health benefit per-unit decrease in the concentration of $PM_{2.5}$ is larger below the current annual NAAQS than above (Di et al. 2017a). This is consistent with the integrated exposure-response function used by the World Health Organization to model the global health burden of air pollution exposure (Burnett et al. 2014, Cohen et al. 2017).

The weight of evidence and trajectory of research underscores that there are risks below the NAAQS, and that the health benefits of each increment of $PM_{2.5}$ reduction below the NAAQS could be larger than those above the NAAQS. The empirical data indicate that an assumption of linearity below the NAAQS would be a well-supported central estimate, with uncertainty that would acknowledge the possibility of either sub-linear or supra-linear effects. Higher uncertainty at lower ambient concentrations does not imply that an assumption of zero is the best estimate available.

Figure 7: Concentration-response function of the joint effects of exposure to $PM_{2.5}$ and ozone on all-cause mortality. From Di et al. 2017a.



C. RIA Estimates of Forgone Public Welfare or Environmental Benefits

Consistent with past executive orders, “Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider" (Executive Order 12866). In particular, environmental effects and social costs that have been documented but have not been given an economic value should be fully incorporated.

In considering the possibility of repealing the CPP, EPA should estimate the forgone benefits to all environmental endpoints and their economic value. Specifically, EPA should expand its consideration of foregone benefits from the repeal of the CPP to include an estimate of the economic value of the foregone environmental benefits of reduced atmospheric deposition of sulfur, nitrogen and mercury; as well as ground-level O_3 concentrations.

The methods and estimates from Capps et al. (2016) and summarized below demonstrate that the foregone benefits to the productivity of selected crops and trees associated with the CPP can be estimated and may be large. Similarly, the RIA for the proposed change in the ozone NAAQS includes methods for estimating the magnitude, distribution, and monetized value of increased productivity to crops and trees associated with reduce ground-level ozone concentrations. Failing to account for these benefits in considering a potential CPP repeal would represent a notable short-coming in EPA's analysis and decision making.

The anticipated air quality improvements from a clean power standard like the CPP are estimated to mitigate productivity losses for some tree species by up to 8.4% and for some types of crops by as much as 15.6% compared to business as usual conditions (Capps et al. 2016). Depending on market value fluctuations of these crops over the next few years, that could add up to gains of tens of millions of dollars for farmers—especially in areas like the Ohio River Valley where power plants currently contribute to ground-level ozone (Capps et al. 2016).

In addition to benefit to crops, decreased PM and ozone are expected to reduce haze and improve visibility in widespread areas across the U.S. Visibility is degraded by emissions of SO_2 and NO_x that form ammonium sulfate and ammonium nitrate aerosols in the atmosphere and absorb water and scatter light. Many National Parks and Class I wilderness areas possess stunning vistas that are an important part of visitors' experience (Malm 1990). The importance of the visual air quality in these lands is recognized through the 1977 Clean Air Act (CAA) which set the goal to prevent future and remedy existing visibility impairment in most Class I Areas (CIAs). CIAs are 158 federal lands with the highest level of air quality protection, 156 of which have visibility protection. The U.S. has established the goal of reducing haze in CIAs to natural levels by the nominal year of 2064.

For a carbon standard similar to the CPP (Scenario 2), the estimated reductions in haze relative to the goals of the Regional Haze Rule are presented in Figure 8a (Driscoll et al. In prep). The haze reduction benefits of the estimated emission reductions are widespread and the Colorado Plateau and Rocky Mountains gaining 1 to 3.7 years of progress toward the RHR goal. The largest co-benefits as absolute reductions in haze are estimated to in the eastern United States.

The emissions reductions from Scenario 2 also provide estimated benefits in visibility based on a change in deciviews on the 20% haziest days (Figure 8 b; Driscoll et al. In prep). On the Colorado Plateau and Rocky Mountains, there would be an estimated 15-66 days of noticeable visibility improvement (Driscoll et al. In prep). The improved visibility on the Colorado Plateau is particularly significant because this region has a unique geology, scenic vistas and some of the clearest air in the United States, leading to a high density of CIAs and iconic national parks. The calculation of foregone benefits under the repeal of the Clean Power Plan should quantify and monetize the effects on haze and visibility.

<u>Figure 8a. Estimated years of progress toward the Regional Haze Rule goals under a power plant carbon standard similar to the Clean Power Plan (Scenario 2) in 2020 compared to a business as usual reference case. Higher values in red indicate more years of progress. Based on Driscoll et al. In prep.</u>

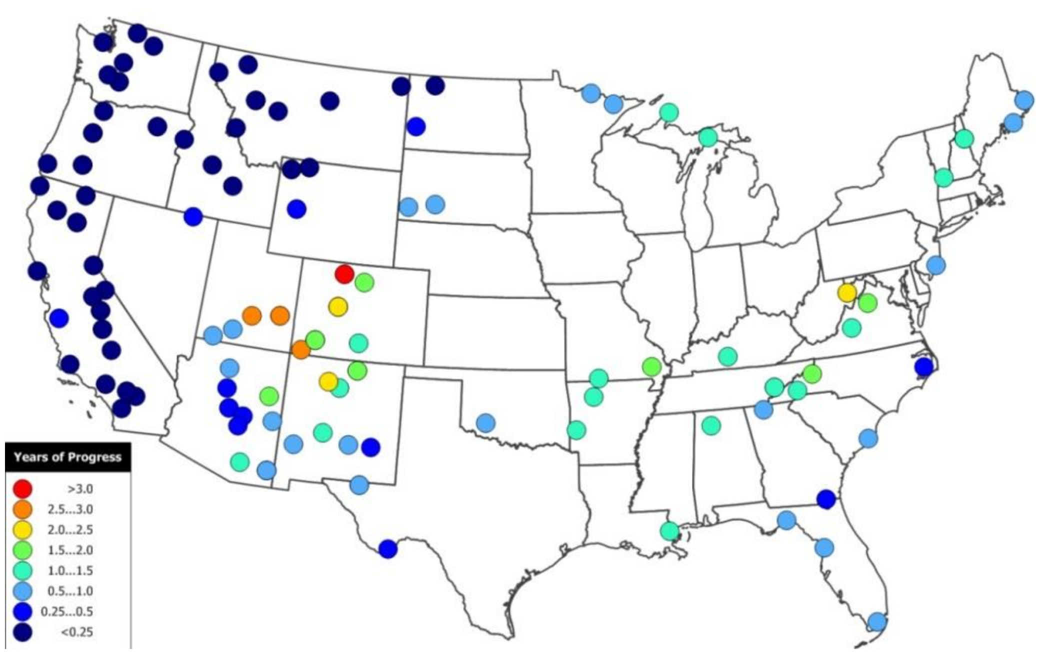
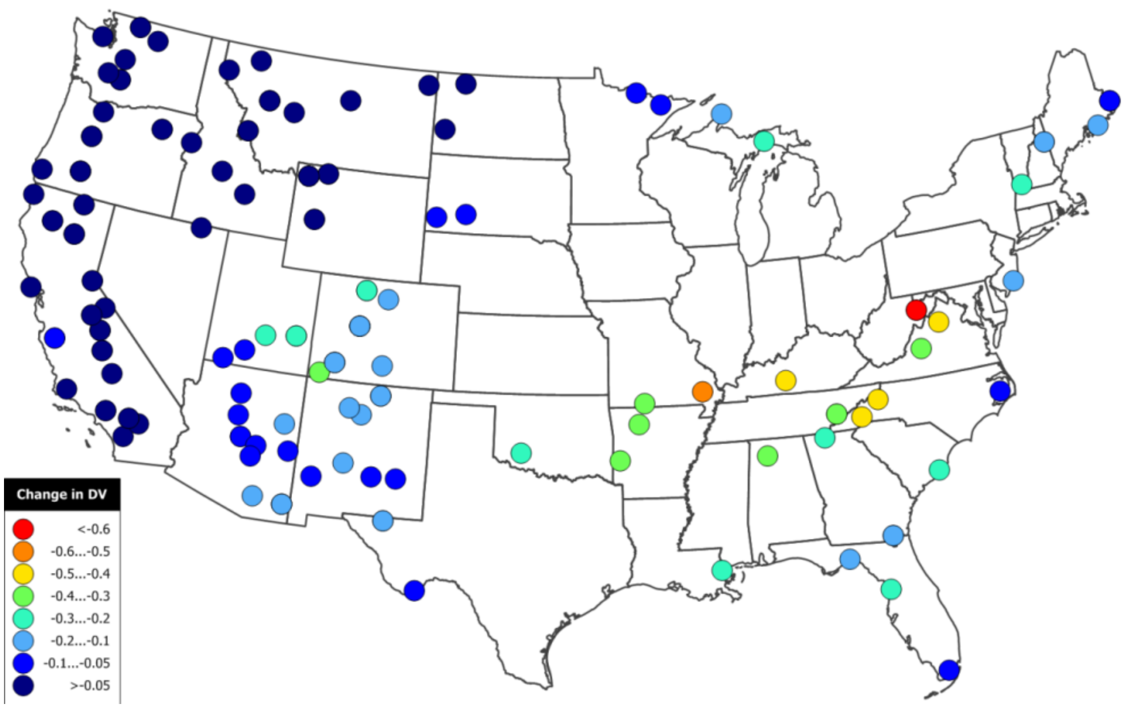


Figure 8b. Estimated change in deciviews on 20% haziest days under a power plant carbon standard similar to the Clean Power Plan (Scenario 2) in 2020 compared to a business as usual reference case.. Higher values indicate a larger increase in visibility. Based on Driscoll et al. In prep.



D. Estimating Costs and Monetized Benefits

Finally, in considering a repeal of the CPP, EPA should follow standard practices like those used in Buonocore et al. (2016) to estimate that the economic value of carbon standards like the Clean Power Plan (Scenario 2). The net benefits of the scenario in that study are estimated at $33 billion per year (Buonocore et al. 2016). The study includes the monetized value of the health benefits associated with reductions in co-pollutants as well as the benefits associated with CO_2 emissions reductions using a social cost of carbon of $43 per ton. This value is well-supported in the scientific literature and should also be applied to the analysis of the foregone benefits of the proposed CPP repeal.

III. Conclusion

In view of the analysis presented here, EPA's selection of an interpretation of section 111 that constrains the determination of BSER to a narrow and factually contradicted approach to the term "at the source" is arbitrary and capricious, not supported by the law, and contrary to the regulatory purpose of reducing carbon dioxide pollution. On this third point, peer-reviewed studies show that this narrow "at the source"-only approach not only does not represent the BSER but could result in increased CO_2 emissions in some power regions, increased total national emissions of SO_2, and adverse health impacts compared to a reference case.

Furthermore, as outlined in these comments, when considering the possibility of repealing the CPP, EPA's RIA should (1) account for the full foregone health benefits and their monetized value for both the target pollutant (CO_2) and other associated air pollutants (SO_2, PM, and NO_x), (2) incorporate the most current research on the effects of air pollution on mortality and morbidity including the shape and absolute value of concentration response functions, and (3) account for the complete environmental and public welfare benefits, including the social cost of carbon, in order to accurately account for the full value of foregone emissions reductions and associated benefits.

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