



NORTH CAROLINA
Environmental Quality

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Governor

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

Acting Administrator Andrew Wheeler
Environmental Protection Agency
EPA Docket Center (EPA/DC)
1200 Pennsylvania Ave. NW
Washington, DC 20460

Subject: Comments on “Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program” Proposed Rule, Docket ID No. EPA-HQ-OAR-2017-0355

Dear Acting Administrator Wheeler:

The North Carolina Department of Environmental Quality (NCDEQ) is providing comments on the Environmental Protection Agency (EPA)’s Proposed Rulemaking “Emission Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units; Revisions to Emission Guideline Implementing Regulations; Revisions to New Source Review Program,” also known as the Affordable Clean Energy (ACE) Rule, published in the *Federal Register* on August 31, 2018 (83 *FR* 44746).

The NCDEQ’s mission is to provide science-based environmental stewardship for the health and prosperity of all North Carolinians. The NCDEQ administers regulatory and public assistance programs aimed at safeguarding the state’s air, water, land resources, coastal fisheries, and the public’s health. As the lead agency charged with implementing the Clean Air Act, the NCDEQ commits itself to protecting and improving ambient air quality for the health, benefit, and economic well-being of all North Carolinians.

In the interest of the health and welfare of North Carolina’s residents, environment, and natural resources, we offer the following comments starting with the acknowledgment that:

1. Anthropogenic greenhouse gas (GHG) emissions contribute to climate change;
2. North Carolina already experiences the effects of climate change;
3. The EPA has a legal obligation to control GHG emissions from electricity generation sources;



4. The electricity generation sector accounts for a significant proportion of total anthropogenic GHG emissions in North Carolina and the nation; and
5. Replacement of the Clean Power Plan (CPP) with the proposed ACE Rule would:
 - a. Limit potential system-wide emission reductions to a negligible amount, and provide no guarantee of any actual emissions reduction;
 - b. Limit North Carolina's ability to build on considerable historical success in reducing power sector GHG emissions to mitigate climate change impacts in the state; and
 - c. Hinder North Carolina's efforts to maintain compliance with all National Ambient Air Quality Standards (NAAQS).

For these reasons, the NCDEQ requests that EPA abandon the proposed ACE Rule, and instead implement emissions guidelines that do not result in emissions increases, but are inclusive of all technological and operational measures utilized currently by electric utilities in the U.S. The EPA should not adopt standards that cause harm to public health and the environment, including a disproportionate impact in economically disadvantaged communities. The following comments provide evidence in support of this request.

The NCDEQ Concerns with the Proposed ACE Rule

1. Proposed ACE Rule Is an Inadequate Response to Risks of Climate Change

Changes to the climate result in more frequent and severe weather events, droughts, fires, floods, and shifting seasons, impacting human health and economic endeavors. These effects exist now. North Carolina already incurs transportation and infrastructure costs due to climate change impacts. With over 3,375 miles of shoreline, North Carolina maintains coastal railways, ports, airports, and supply systems for water and energy located at or just above sea level. Therefore, the effects of sea-level rise magnifies with increased frequency and intensity of adverse weather events. The impact from the most recent Hurricanes Florence and Michael caused loss of human life, property damage, and long-term economic impact to our coastal counties. While direct and full attribution from climate change to a single weather event may be difficult to conclude, a collection of these events over an extended period becomes ever more impossible to deny the connection between climate change and weather driven economic catastrophes. These anticipated impacts to the environment, and in turn our economy, are supported by a broad scientific consensus.¹ Despite past efforts, the need persists to urgently address contributions to climate change from human activities.²

In 2016, the EPA finalized the CPP, which set the first ever national goals for reduction of carbon pollution from power plants. The EPA and stakeholders involved in crafting the CPP designed it to regulate power plant emissions on a sector-wide and state-wide basis incentivizing a shift away from high carbon dioxide (CO₂)-emitting fossil fuel power plants toward low- and zero-emitting fossil and non-fossil fuel electricity generators, while maintaining flexibility for

¹ Intergovernmental Panel on Climate Change (IPCC). "Global Warming of 1.5°C," October 8, 2018, retrieved from <http://www.ipcc.ch/report/sr15/>.

² Nordhaus, William; "Projections and uncertainties about climate change in an era of minimal climate policies," (December 2016) Cowles Foundation Discussion Paper No. 2057.

states to choose the most cost-effective methods for achieving emissions reduction. When EPA issued the final CPP, it reflected moderate emission goals for the power sector, not reductions based on the maximum degree of stringency achievable. The CPP was estimated to reduce GHG emissions in 2030 by 32 percent below the 2005 baseline.

The EPA's replacement for the CPP, the proposed ACE Rule, does not provide meaningful reductions of CO₂ emissions as required of EPA under Court rulings.³ The aggregate national reductions under the proposed ACE Rule pale in comparison even to power plant emission reductions in several individual states during the 2006-16 period, according to EPA's own fact sheet.⁴ In six states, the power sector reduced CO₂ emissions by more than the largest CO₂ emission reductions shown in EPA's modeling for the proposed ACE rule *nationally* (27 million short tons). North Carolina alone reduced emissions by more than 22 million short tons over the 2006-2016 period.

By limiting the scope of CO₂ control to heat rate improvements (HRI) at coal-fired generation units, the proposed ACE Rule limits CO₂ reductions to a *maximum* of 4.5 percent.⁵ While this 4.5 percent reduction in itself is too low to provide a reasonable response to the serious challenges from climate change, under EPA's modeling of the rule, the actual realized 2025 emissions reductions range from 0.7 to 1.6 percent. Even lesser reductions are estimated in future years. The EPA's assertion that this negligible decrease in emissions is the *best* system of emissions reductions (BSER) for the sector is indefensible.

In addition, the NCDEQ has concerns that the small CO₂ reductions expected to be achieved through HRI may not be detectable or verifiable due to inherent variability in measuring CO₂ emissions from coal-fired generating units. The EPA's Part 75 regulations contain techniques for certifying against standard methods that assure the data quality of key measurements for parameters such as stack flow and concentration of oxygen (O₂) or CO₂ in the flue gas. The information collected through these methods is used to report CO₂ emissions. The National Institute of Standards and Technology estimates that the inconsistencies between measured CO₂ emissions and emissions calculated from coal consumption are on the order of 10 to 20 percent. Therefore, even if CO₂ emissions can be measured reasonably well, the uncertainty may exceed the range of ability to control factors affecting unit efficiency on a well-maintained coal-fired EGU. It is also possible that the uncertainty will exceed the range of enhanced performance that might be attributed to a major efficiency project.

The following summarizes our specific concerns with the EPA's proposed ACE Rule approach to defining BSER for power plants.

³ *AEP v. Connecticut and New York v. EPA*.

⁴ U.S. EPA Fact Sheet: Proposed ACE Rule – CO₂ Emissions Trends, at https://www.epa.gov/sites/production/files/2018-08/documents/ace_trends.pdf

⁵ Assuming that all states adopt the highest level of potential heat rate improvements identified by EPA and that all affected units continue at their current dispatch levels.

A. Improperly Limits Scope of Best System of Emissions Reduction (BSER)

i. Improperly Defines BSER

Section 111(d) of the CAA requires EPA to identify the BSER that is adequately demonstrated and available to limit pollution. Section 111(a)(1) defines “standard of performance” as “a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.” The proposed ACE Rule limits the definition of the BSER to HRI at coal generating units.

Contrary to this constrained approach, the best demonstrated system for GHG reductions from power plants is coordinated planning efforts with the objective of achieving a given emissions reduction goal via generating electricity with lower GHG-emitting sources. In practice this may take the form of replacing coal generation units with natural gas units and fossil fuel units with renewable energy alternatives. The proposed ACE Rule narrowly limits states to only efficiency improvements at coal-powered energy generating units. This severely constrained approach, which treats energy facilities in isolation, fundamentally disregards the interconnected nature of the electric grid.

Because the statute requires the “system of emission reduction” EPA selects to be “adequately demonstrated” and the “best” available system, the statutory language clearly requires that EPA look at the methods that sources themselves use to reduce emissions and to select the best such method. The CPP regulatory record is full of information supporting the viability of generation shifting “at” or “by” sources to reduce emissions at and of those sources, which EPA makes no attempt to rebut in its replacement rule. Interpreting the CAA to preclude consideration of demonstrated and effective means of pollution control, currently being deployed by the sources at issue, when determining the “best system of emission reduction” is unsupported considering the plain meaning and context of the statutory language in section 111.

As with the plain language of the statutory text, there is nothing in the legislative history of the CAA to suggest that Congress intended to limit the measures that the EPA could consider or that a source could use in a way that would exclude generation shifting. A restrictive interpretation that prohibits consideration of generation shifting measures would be inconsistent with Congress’ specific instruction to EPA in section 111 to choose the “best” system of emission reduction that has been “adequately demonstrated.” The fact that EPA’s restrictive interpretation unreasonably forecloses the EPA from considering the very measures that are most effective at reducing emissions, are already widely used, and that power plants themselves choose to reduce emissions, suggests that this reading of BSER is an impermissible interpretation of section 111(a)(1).

In numerous previous rulemakings, the EPA demonstrated that it had sufficient information to analyze impacts to grid operations from generation shifting expected to result from those rules. Now the EPA disregards this information and claims to be unable to understand how the grid

works in order to justify rejecting generation shifting as a component of the best system.⁶ (“Because of these significant uncertainties that can have large impacts on electric reliability and the cost of electricity to consumers, the EPA believes this further supports the unreasonableness of basing the BSER on generation-shifting measures.”) The EPA has experience devising and implementing rules designed to allow for generation shifting in the power grid. For example, EPA’s 2011 Cross-State Air Pollution Rule (CSAPR) set statewide emissions budgets for power plant nitrogen oxides (NO_x) and sulfur dioxide (SO₂) emissions, and based those budgets in part on the ability of plants to cost-effectively shift generation to lower-emitting plants.⁷

ii. Even Under EPA’s Narrow Definition of BSER, Excludes Effective/In-Use Strategies

The EPA disregards several proven control options that meet its own definition of BSER in the proposed ACE Rule. These control options include: co-firing of coal and natural gas, off-site coal cleaning, and carbon capture and sequestration (CCS). The EPA’s analysis of BSER under the proposed ACE Rule improperly points to analyses performed for the CPP to support its conclusion that these options are not BSER. States and cities have already enacted programs and policies with these control options that have resulted in substantial GHG reductions from existing plants without harming grid reliability or impeding economic growth. As an example, our North Carolina power generating fleet already incorporates emissions improvement strategies, like HRI and co-firing with natural gas, through past statewide actions to address air quality improvements that have also reduced GHG emissions. The omission of proven emission reduction strategies from the proposed ACE Rule unnecessarily limits strategies that states can use to maximize GHG reductions while minimizing costs. The following paragraphs discuss why each of these options should be considered BSER for the power sector.

The EPA overlooks the fact that its previous CPP determination that CCS should not be part of BSER was based on comparing CCS to options that the EPA adopted in the CPP. In 2015, the EPA did not conclude that CCS was inherently “too expensive.” In fact, it found that CCS was cost-effective at certain units, but not as cost-effective as generation shifting measures. If the EPA intends to exclude generation shifting as part of BSER, then the EPA must reconsider the merits of CCS.

In addition, EPA bases its rejection of CCS in part on its assertion that CCS is not feasible at every site. In making this argument, the EPA arbitrarily applies different criteria to CCS than to its own favored HRI approach. Indeed, EPA allows HRI technologies to be evaluated on a site-by-site basis, even though it admits that not all of them will be viable at every power plant).

The EPA’s rejection of co-firing a coal-fired plant with natural gas or biomass, like its rejection of CCS, relies on the EPA’s now irrelevant comparison of the cost of co-firing with the cost of generation shifting, and it also relies on the false premise that co-firing must be feasible at every site in order to be considered as a component of the BSER. Furthermore, it overlooks the fact that this is a measure currently being implemented at affected power plants. North Carolina

⁶ See, e.g., 83 *Fed. Reg.* at 44764.

⁷ See 80 *Fed. Reg.* at 64772 (citing 76 *Fed. Reg.* 48452).

utilities have already begun, or are in the process of, co-firing coal units with natural gas, resulting in CO₂ emissions reductions from coal (and increases from natural gas).

In the proposed ACE Rule, the EPA also refuses to evaluate fuel switching as a component of BSER, which disregards the evidence that fuel switching can be a viable emission control strategy for some sources. As with CCS and co-firing, the EPA’s failure to consider—in the context of a rule that requires site-specific evaluation of control measures—an emission control measure on which it already possesses evidence of feasibility and effectiveness, cannot be justified.

It is important to note that EPA’s own modeling of the proposed ACE Rule shows that some coal units, including units in North Carolina, will retire and their generation capacity will shift to natural gas units (in our State, this results in 2030 CO₂ emission reductions of 9 percent from coal units, and CO₂ emissions increases of 18 percent from gas units). In essence, EPA is concluding that even with a rule focused solely on HRI, re-dispatching to natural gas will occur. Therefore, EPA’s own analysis provides that the CPP’s fundamental basis of re-dispatching to natural gas is a reasonable and cost-effective option. More concerning is that the NCDEQ’s review of EPA’s modeling files for this rulemaking was unable to identify any application of HRI to coal units in the U.S. under all three ACE Rule scenarios.⁸ If this result is correct, EPA has used substantial resources to develop a rule, which in turn requires states and utilities to invest significant resources, that appears to not accomplish what it explicitly sets out to do. Furthermore, although EPA modeling shows generation shifting primarily to natural gas, renewable sources are now cost-competitive with natural gas (see Table 1 below). Generation shifting to renewable sources would offer even greater emissions reductions than those modeled by EPA (see discussion in Section 2.B).

Table 1. Levelized Cost of Electricity (LCOE) for New Generation in 2022 and 2040 (2017 \$/MWh)⁹

Indicator	<u>Advanced NGCC</u>		<u>Solar</u>		<u>On Shore Wind</u>	
	2022	2040	2022	2040	2022	2040
Capacity-weighted						
LCOE	48.1	47.6	59.1	44.1	48.0	56.4
LCOE with tax credit	48.1	47.6	46.5	40.8	37.0	56.4

With respect to the CPP, EPA did not define HRI at gas-fired power plants as components of BSER, finding that the resulting reductions would likely be too small or too expensive to merit consideration when compared to other CPP components. The NCDEQ identified several HRI actions taken at gas-fired turbines located within North Carolina. These projects are cost-

⁸ U.S. EPA, Clean Air Markets Program Division, “Analysis of the Proposed ACE Rule,” <https://www.epa.gov/airmarkets/analysis-proposed-ace-rule>, accessed October 31, 2018.

⁹ U.S. Energy Information Administration. “Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2018,” (2018 March), retrieved from https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.



effective because they were voluntarily installed at existing power plants. This information supports the conclusion that HRI projects that have been implemented by gas plants can have a sufficient payback period to make them cost-effective under this rulemaking. Although not included as BSER, EPA noted that HRI may be expected to be implemented on some gas-fired EGUs in response to the CPP (e.g., to compile emissions reduction credits). Therefore, HRI at gas-fired power plants was endorsed by the EPA for use where appropriate. The EPA fails to explain why excluding HRI at gas-fired plants from BSER is warranted here. For the proposed ACE Rule, HRI at gas-fired power plants must be compared to different emission reduction measures in determining that they are excessively expensive or result in too few emissions reductions. The NCDEQ believes that EPA must include emission guidelines for all affected stationary sources that emit CO₂, regardless of fuel type.

iii. Extends Life of Higher-Emitting Generation Units

The proposed ACE Rule's definition of BSER will result in extending the life of higher-emitting generation units. The proposed rule removes the market-forcing effect of internalizing the true cost of GHG externalities in making electric generation decisions.¹⁰ It does this by eliminating the need to reduce total GHG emissions given that facilities can demonstrate compliance via a loophole: unlike the CPP, the proposed ACE Rule will allow plants to increase their overall GHG emissions as long as they can demonstrate that their hourly emissions rate has decreased. This result surely cannot represent system-wide BSER.

B. Sets No Actual Annual Emissions Limit or Goal

i. Impacts on GHGs

Coal plants that remain operating and apply HRI would be expected to be dispatched more frequently and at a higher capacity because the unit's operating costs per kilowatt-hour have decreased and because the plant must recover the cost of the HRI (this phenomenon is known as the "rebound effect"). Significant increases in the operation of such units could be considered a major modification under the New Source Review (NSR) program. However, the ACE Rule also includes proposed revisions to the NSR program that would provide a mechanism for these facilities to no longer be subject to NSR provisions. There is no annual limit or emissions reduction goal for CO₂ emissions from existing fossil fuel units (both affected and non-affected sources) under the proposed ACE Rule – plants can increase their total emissions without limit as long as their hourly emissions rate has been demonstrated to have decreased, ensuring that high-emitting power plants can run for more hours per day, and at higher loads (and extending the economic life of these plants). As discussed in Section 2.B, EPA's modeling shows that the proposed ACE Rule would provide no GHG reduction benefit in North Carolina. The proposed rule will therefore harm overall air quality by increasing HRI-modified coal units' potential to emit rather than replacing them with cleaner energy solutions.

¹⁰ The proposed ACE Rule analysis also understates the value of these externalities via their use of an improperly low estimate of the social cost of carbon and improperly high discount rates as discussed in Section 4 of this comment letter.

The EPA concedes that: (1) emissions could increase at particular plants following heat-rate improvement projects due to the rebound effect; (2) annual emissions of CO₂ (and NO_x and SO₂) could increase because power plants will be able to avoid NSR permitting and pollution control requirements; and (3) it is not establishing an overall level of CO₂ emission reduction that power plants in each state will have to achieve. And yet, the EPA still claims that “there will be no cumulative increases in system-wide emissions” under a BSER based on HRI. The EPA previously expressed concern that heat rate measures would cause a rebound effect resulting in inadequate reductions.¹¹ The EPA has not provided a reasonable explanation as to why it no longer has this concern, nor has EPA sufficiently evaluated whether the “rebound effect” will result in higher overall emissions from coal-fired plants under the proposed ACE Rule.

In the proposed ACE Rule, EPA is not requiring reductions of any kind, let alone meaningful reductions. The EPA’s decision to abandon setting a minimum level of emissions reduction provides states with wide discretion to delay and avoid reducing their emissions. Modifications to the BSER and NSR portions of the CAA undermine the Congressional intent for the EPA to ensure a baseline of pollution protection to avoid a harmful “race to the bottom” among the states.

The proposed weakening of NSR would improperly compound the problem of an inadequate BSER by exempting even HRI projects that are not required by state plans to comply with the ACE Rule. In proposing to eliminate a presumptive emission standard, EPA would abdicate its critical role under the CAA to set a minimum level of emission reduction to address endangerment from existing stationary source air pollution.

ii. Broader Impacts of New Source Review Revisions

By proposing that modified sources would not trigger NSR unless the modifications are causing *both* an increase in yearly emissions *and* an increase in the hourly emissions rate, EPA would allow such a unit to increase its annual capacity (i.e., the number of hours it operates each year). This would almost certainly increase the unit’s actual emissions, without being subject to a NSR review, and therefore without ensuring that air quality is protected or that “modified industries are as clean as possible, and advances in pollution control occur concurrently with industrial expansion.”¹²

The proposed approach of shifting to an hourly test has the potential to prevent states from maintaining or attaining the NAAQS, which is the fundamental purpose of the NSR program. Congress’ objective in enacting the NSR program was to ensure that major investments in, and changes to, existing sources that increase the pollution burden borne by our states’ residents are accompanied by a review to ensure that those sources are installing pollution control equipment to reduce emissions to enable attainment and maintenance of attainment with the NAAQS. The critical issue for addressing ambient air pollution is not only the hourly rate at which a source emits pollution, but the total amount of pollution emitted.

¹¹ See 80 *Fed. Reg.* at 64745.

¹² EPA, “New Source Review (NSR) Permitting,” <https://www.epa.gov/nsr>, accessed October 22, 2018.

The proposed NSR changes would apply to all EGUs as defined by 40 § CFR 51.124(q) and for all regulated NSR pollutants. In addition to opposing any of these proposed changes to the NSR program as they relate to the proposed ACE Rule, we also have significant concerns with these changes applying to units that would not be subject to Section 111(d) HRI measures. Without undertaking any modeling to fully assess the air quality and health implications of these changes, EPA is simply creating a loophole for high-emitting plants to make life-extending investments in their plants without proper analysis, and possibly without installing appropriate air pollution control equipment, jeopardizing the attainment and maintenance of the NAAQS and undermining the CAA program that Congress enacted specifically to address this concern. Given the broad impacts of the proposed NSR program revisions, it is imperative that EPA not finalize any changes at this time. If EPA deems changes necessary, then EPA should instead move forward via a separate rulemaking. Such rulemaking must include an analysis of all impacts of the proposed revisions, so the public will have the opportunity to provide informed comment.

2. Proposed ACE Rule is Counter to State and Regional Efforts to Reduce Impacts of Climate Change

The proposed ACE Rule provides less flexibility and increases the regulatory burden on North Carolina, while providing no clear benefits. The money spent in making HRI to coal plants and administering the proposed rule will not result in substantial decreases in CO₂, and therefore cannot represent BSER. The efforts the NCDEQ will be required to undertake to identify HRI requirements at the unit-level will replace those that could be used to implement a more effective regulatory approach.

Unlike criteria pollutants, the effects of GHGs are felt regionally, nationally, and globally over a span of generations. Singular actions by local or state governments are insufficient to reduce GHG emissions below the critical threshold identified by a consensus of the scientific community. Although North Carolina recognizes and accepts this challenge to address climate change, Federal actions to reduce GHG emissions remain vital to address the scope of the problem. The proposed ACE Rule will result in nominal, if any, GHG reductions, and given the history of North Carolina and other states in achieving substantial reductions in GHG, it can only be viewed as an inadequate Federal response to the problem.

A. Other States May Increase Emissions Counteracting Our Historical Efforts

Other states could potentially increase their power sector emissions for the same reasons stated above, negatively impacting efforts to mitigate potential future climate impacts, and also negatively impacting North Carolina's air quality related to criteria and air toxic pollutants.

B. EPA Modeling Shows Increases in State CO₂ Emissions

The EPA’s modeling of the proposed rule indicates that this rule does not result in decreases of CO₂ emissions from the power sector fossil fuel units but will actually result in increases for North Carolina and several other states. Table 2 summarizes the impact of the proposed ACE Rule on North Carolina’s power sector fossil fuel CO₂ emissions as modeled by EPA. This table shows that EPA anticipates that the proposed ACE Rule will result in CO₂ emissions *increases* in our state. The NCDEQ is unable to support an environmental protection rule that is projected to have the opposite of its intended effect in North Carolina.

Table 2. Power Sector Fossil Fuel CO₂ Emissions Impacts of ACE Rule in North Carolina (thousand tons/year)

EPA Modeling Case	2025	2030	2040	2050
No CPP	45.07	44.32	42.59	44.69
ACE Rule*	45.24	44.70	43.67	44.73
<i>% Change</i>	0.4%	0.9%	2.5%	0.1%

*With maximum HRI modeled by EPA

Coal retirements have resulted in North Carolina meeting its CPP mass goal for the state in 2017. By 2024, North Carolina expects another 1,020 MW of coal plants to retire, replaced by approximately 1,035 MW of NGCC. This will further decrease CO₂ emissions approximately 20 percent below the CPP mass goal. In addition, North Carolina also has a Renewable Energy Portfolio Standard (REPS), which requires North Carolina to obtain 12.5 percent of its retail electricity sales from a mix of renewable energy sources, biomass fuel, or energy efficiency by 2021.¹³ In 2017, North Carolina had over 14.5 million megawatt hours in documented renewable energy generation and energy efficiency avoided generation under the REPS.¹⁴ This law, in combination with other favorable market conditions, has resulted in less reliance on fossil fuels for electricity generation and has contributed to cost-effective decreases in CO₂ emissions in North Carolina, as well as creating a new clean electricity economy in our state. The costs and benefits of North Carolina’s historical path to reducing CO₂ emissions, even in the absence of a national CO₂ rule and with a growing population, indicates clearly that major reductions in CO₂ are feasible without creating electricity reliability concerns.

The NCDEQ also notes that due to substantial flaws in EPA’s modeling of the CPP for North Carolina, EPA has significantly understated that program’s emissions reduction benefits by understating redispatch to natural gas and renewable energy units. The specific flaws that result in this outcome include: 1) no interstate trading, 2) no set-asides for renewable energy, 3) leakage of emissions to new units, and 4) unrealistic capital costs for solar and wind power plants relative to natural gas plants.

¹³ Session Law 2007-397, “North Carolina’s Renewable Energy and Energy Efficiency Portfolio Standard (REPS)”, August 20, 2007, <http://www.ncuc.commerce.state.nc.us/reps/reps.htm>.

¹⁴ North Carolina Renewable Energy Tracking System (NC-RETS) certificates issued for 2017, accessed on October 23, 2018 at <https://www.ncrets.org/>.



With respect to this last issue, Table 3 displays a comparison between the ACE Rule’s 2023 year cost per kilowatt-hour estimates for new natural gas, solar, and wind units compared to the estimates reported by the Energy Information Administration (EIA).¹⁵ In EPA’s modeling, the capital cost of new solar and wind generation are greater than those of new natural gas combined-cycle (NGCC) generation by factors of 10 and 35, respectively. In addition, annual operation and maintenance costs for solar and wind are much higher in EPA’s modeling than EIA forecasts. Therefore, emissions reductions that might otherwise be projected due to shifting coal generation to solar and wind do not occur in any of EPA’s modeling. Had EPA’s modeling used EIA’s cost estimates, it is possible that significant generation shifting would have occurred to renewable energy sources.

Table 3. Cost of New Natural Gas Combined-Cycle (NGCC), Wind, and Solar Generation (2017 \$)

Source	Levelized Capital Cost \$/kW	Levelized Annual O&M \$/kW	Ratio of Capital Costs Relative to NGCC	Ratio of O&M Costs Relative to NGCC
EPA Model in Year 2023				
Wind	\$127.00	\$37.79	35.3	1.21
Solar	\$37.45	\$20.33	10.4	0.65
NGCC	\$3.60	\$31.18		
EIA in Year 2022				
Wind	\$33.00	\$12.70	2.1	0.40
Solar	\$48.20	\$7.50	3.1	0.24
NGCC	\$15.50	\$31.60		

C. Creates Significant Burden on State Agencies for Little or No Benefits

Under the proposed ACE Rule, agencies preparing their state plans will be required to evaluate HRI projects for each of EPA’s seven chosen “candidate technologies” at each power plant in the state covered by the rule. The EPA acknowledges that this “will entail many hours of staff time to develop and coordinate programs for compliance with the proposed rule.”¹⁶ This may especially be the case for states that have significant numbers of power plants, such as North Carolina. Because EPA is not proposing a presumptive emission limit, the analysis of whether a particular power plant can implement one or more of the candidate technologies and what HRI (and emission rate) can be expected following such a project may be difficult for permitting agencies to perform given their level of power plant engineering expertise.

Moreover, the potentially significant investment of resources and expertise will, as explained in the sections above, likely yield little, if any, benefits in terms of reducing carbon pollution and

¹⁵ U.S. Energy Information Administration, “Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2018, March 2018
https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

¹⁶ 83 Fed. Reg. at 44796.



may even result in worsening air quality, depending on the state. This waste of state resources is yet another reason the EPA should abandon its proposal.

3. Rule Will Harm Efforts to Reduce Health and Welfare Impacts of Other Pollutants

In addition to its effects on CO₂ emissions, EPA’s modeling suggests that national emissions of NO_x and SO₂ would increase under the proposed ACE Rule. The EPA acknowledges that the proposed replacement rule would cause increased emissions of NO_x and SO₂ compared to the Clean Power Plan: 32 to 39 thousand more tons of NO_x and 45 to 53 thousand tons more of SO₂ in 2030.¹⁷ As displayed in Tables 4 and 5, North Carolina’s power sector fossil fuel emissions of both NO_x and SO₂ are projected to increase under the proposed ACE Rule relative to the no action (no CPP) case. Furthermore, the combination of the rebound effect and NSR revisions could result in upwind states increasing their emissions. Only recently has North Carolina attained the NAAQS for all pollutants and been found not to be contributing to nonattainment of ambient air monitors in downwind states. The NCDEQ does not want to slide backwards and relinquish these hard-fought improvements in air quality for both our residents and our business community, but the EPA’s proposed ACE Rule threatens our achievements.

Table 4. NC Power Sector Fossil Fuel NO_x Emissions Impacts of the Proposed ACE Rule (thousand tons/year)

EPA Modeling Case	2025	2030	2040	2050
No CPP	22.7	19.1	12.9	11.2
ACE Rule*	22.8	19.9	14.8	11.3
% Change	0.5%	4%	15%	0.8%

*With maximum HRI modeled by EPA

Table 5. NC Power Sector Fossil Fuel SO₂ Emissions Impacts of the Proposed ACE Rule (thousand tons/year)

EPA Modeling Case	2025	2030	2040	2050
No CPP	11.5	9.5	8.3	7.5
ACE Rule*	11.7	9.9	9.0	7.7
% Change	2%	3%	9%	3%

*With maximum HRI modeled by EPA

The NCDEQ believes that the NSR aspects of the proposed ACE Rule, could lead to increases in air pollution from NO_x, SO₂, mercury, and other harmful pollutants due to the “rebound” effect. This outcome creates health burdens falling disproportionately on low-income communities and communities of color, which the NCDEQ and the EPA consider environmental justice concerns. The EPA’s own analysis estimates, on a national basis, that the rule could lead to as many as 1,630 premature deaths annually by 2030 due to increases in particulate matter PM_{2.5} and ozone, as well as other detrimental health outcomes such as up to 15,000 new cases of upper respiratory problems, and 10,000 additional missed school days. In comparison, the CPP rule was estimated to *prevent* between 1,500 and 3,600 premature deaths per year by 2030. Given these severe

¹⁷ 83 Fed. Reg. at 44784, Tbl. 6.



impacts, the NCDEQ respectfully requests that the NSR portion of the proposed ACE Rule be severed completely from this rulemaking action.

4. Several Aspects of EPA's Regulatory Impact Analysis are Flawed

The Regulatory Impact Analysis (RIA) of the proposed ACE Rule contains several serious flaws, including: (a) understating the social cost of carbon (SCC), (b) use of a discount rate that is too high, and (c) inappropriately eliminating PM_{2.5} health benefits. The NCDEQ is concerned that these flaws unjustifiably diminish the health, environmental, and economic benefits from reducing CO₂ and other pollutants' emissions.

A. Social Cost of Carbon

The EPA underestimates the SCC by relying on a number that is dramatically lower than any that were used in hundreds of regulatory proceedings at the federal level through January 2017. This reduction in the SCC is primarily due to the EPA's decision to calculate the SCC on a domestic rather than a global basis. This decision is a dramatic change because the global SCC is larger than the domestic SCC by a factor of about seven. The NCDEQ previously submitted comments on this topic under EPA's proposed rulemaking for "Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units."¹⁸ The following summarizes the NCDEQ's key points regarding the EPA's estimation of the SCC in the proposed ACE Rule:

- (1) By calculating the SCC on a domestic rather than a global basis, EPA failed to account for the global effects of carbon pollution that impact the U.S. and its *citizens*. By using a domestic SCC, the EPA failed to consider the welfare of 9 million U.S. *citizens* living abroad, including military personnel.
- (2) By omitting any analysis of the global SCC, the EPA failed to adhere to OMB's Circular A-4, which instructs under the "Scope of Analysis" section that "where you choose to evaluate a regulation that is likely to have effects beyond the borders of the United States, these effects should be reported separately."¹⁹ By omitting any global SCC calculation, the EPA has not followed the OMB guidance that they cite in support of use of a domestic SCC.²⁰ The EPA is therefore concealing from the public the impact of switching from a global SCC that has been used in multiple past rulemakings and recently been upheld in Court.²¹
- (3) The EPA's domestic SCC omits important spillover effects on U.S. corporations. The negative effects of global climate change impact U.S. corporations both directly (through

¹⁸ Comments on Proposed Rulemaking - Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, April 26, 2018, EPA Docket ID No. EPA-HQ-OAR-2017-0355.

¹⁹ Office of Management and Budget, Circular A-4, September 17, 2003, pg. 14.

²⁰ PRIA at page 1068: "Circular A-4 states that analysis of economically significant proposed and final regulations should focus on benefits and costs that accrue to citizens and residents of the United States. We follow this guidance by adopting a domestic perspective in our central analysis."

²¹ Reilly, Amanda, "Court rules for DOE, upholding Obama's social cost of carbon," E&E News, August 9, 2016, <https://www.eenews.net/stories/1060041382>.

assets they own in other countries) and indirectly (through disruptions of market supply chains).

- (4) Even if a domestic SCC number were appropriate (which it is not), the most recent, peer-reviewed, scientific analysis published in a top journal indicates \$48 per ton of CO₂ is the best estimate of such a U.S. domestic value—far higher than the \$1 to \$7 range used to justify the proposed rulemaking.²²

B. Discount Rates

Discount rates are applied to discount the benefits that will be incurred in future years to a current year. In estimating the benefits of the proposed ACE Rule, EPA focuses on the use of discount rates of 3 and 7 percent, which were values recommended in 2003 by the Office of Management and Budget (OMB)'s via Circular A-4. The 7 percent discount rate represents the historical before-tax return on private capital. While the use of a 7 percent discount rate is consistent with past OMB regulatory guidance, this high discount rate is inappropriate for use in estimating the SCC because it is incompatible with the long-lived nature of GHG emissions in the atmosphere, and the fact that damages from emissions today will continue to impact generations to come. Since development of OMB's guidance, the best available science and majority of experts agree that the discount rate for SCC should be closer to 2 percent. The use of a 7 percent discount rate biases the consideration of benefits toward the current population at the expense of the welfare of future generations. Applying this approach is arbitrary and capricious since more recent peer-reviewed economic models on the SCC indicate that lower discount rates are more appropriate. A recent report from the Council of Economic Advisors found that evidence supports a rate lower than 3 percent as the norm for the consumption rate of discount, which it suggested should be at most 2 percent given historical trends and expected future conditions.²³ In keeping with the current state-of-science on the subject, we urge EPA to calculate the proposed ACE Rule benefits using a discount rate no greater than 2 percent.

C. PM_{2.5} Health Benefits

The proposed rule's use of NAAQS as compliance thresholds eliminates all foregone benefits associated with exposure to air pollution below the standards for PM_{2.5}, thus significantly underestimating the actual benefits associated with carbon emission reductions. The NAAQS were established as reasonable benchmarks for limiting unacceptable risks to public health. The EPA's use of the NAAQS as thresholds disregards the public health costs that result at exposures below those limits. By doing so, EPA assumes that NAAQS represent limits below which there are no discernible benefits. This assumption is simply incorrect and inconsistent with the former EPA Administrator's testimony before the Environment Subcommittee of the House Committee

²² Ricke, K., Drouet, L., Caldeira, K. and Tavoni, M., 2018. "Country-level social cost of carbon." *Nature Climate Change*, 8, pp. 895–900, published September 24, 2018, https://www.nature.com/articles/s41558-018-0282-y?utm_source=Nature_community&utm_medium=Social_media_advertisingCommunity_sites&utm_content=BenJoh-Nature-MultiJournal-Social_Sciences-Global&utm_campaign=MultipleJournals_USG_SOCIAL.

²³ "Discounting for Public Policy: Theory and Recent Evidence on the Merits of Updating the Discount Rate, Council of Economic Advisers Issue Brief," January 2017.

on Energy and Commerce, during which he stated that scientists agree that fine particulate matter (PM_{2.5}) is a dangerous health hazard and that no safe level of exposure has been identified.^{24,25}

In the proposed ACE Rule, EPA chose to include two additional estimates of the benefits from reductions in PM_{2.5} emissions: (1) eliminating the health benefits of PM_{2.5} reductions below the established NAAQS threshold and (2) eliminating the health benefits of reductions below the lowest measured level (LML) threshold observed in major studies. The EPA argues that these changes better reflected the uncertainties associated with estimating such benefits; however, the EPA has consistently evaluated the health risks from individual pollutants, and where no safe level of exposure to a pollutant has been identified, the health benefits are included for reductions at all levels. Ignoring those benefits overlooks the real lives that would be improved, extended, or saved in our states from those reductions, something no regulatory analysis should do. We believe that this is a complex matter that requires rigorous scientific analysis, debate, and public discussion. We request that EPA remove this new approach for estimating health benefits of reductions in emissions of PM_{2.5} as it has far-reaching impacts to future regulatory impact analysis. If EPA does not want to rely on existing science, then we instead recommend that EPA convene a scientific panel and open a national dialogue to address the fate of the PM_{2.5} health benefit analysis process.

In North Carolina, compliance strategies deployed by coal plants to reduce NO_x and sulfur oxide emissions under the state's Clean Smokestacks Act (CSA) played a major role in the reduction of PM_{2.5} emissions, resulting in attainment of the PM_{2.5} standards and improved visibility at our national parks and wilderness areas. As a result of these improvements, the CSA emission caps were adopted into the state implementation plan, and are federally enforceable. In recent years, numerous independent studies have documented both the health and economic benefits related to declining pollution levels. A study by the University of North Carolina–Chapel Hill estimated that CSA-related air quality improvements decreased the risk of premature death attributable to PM_{2.5} sulfate in North Carolina by about 63 percent, resulting in an estimated 1,700 deaths prevented in 2012.²⁶

Now, EPA is including sensitivity analyses that disregards these potential health benefits of PM_{2.5} reductions below the established NAAQS thresholds and below the LML threshold. We urge EPA to fulfill its responsibilities under the CAA and ensure that full health benefits of PM_{2.5} reductions are recognized.

As noted earlier, the NCDEQ's review of EPA's modeling files for this rulemaking was unable to identify any application of HRI to coal units in the U.S. under all three ACE Rule scenarios. If this result is indeed true, EPA has used substantial resources to develop a rule, which in turn

²⁴ The Mission of the EPA: Hearing Before the Subcommittee on Environment, H. Comm. On Energy and Commerce, 115th Congress, 2017, Statement of Administrator Scott Pruitt.

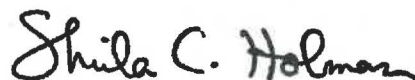
²⁵ U.S. EPA, Summary of Expert Opinions on the Existence of a Threshold in the Concentration-Response Function for PM_{2.5} related Mortality, June 2010, <https://www3.epa.gov/ttnecas1/regdata/Benefits/thresholdstd.pdf>.

²⁶ Ya-Ru Li and Jacqueline MacDonald Gibson, "Health and Air Quality Benefits of Policies to Reduce Coal-Fired Power Plant Emissions: A Case Study in North Carolina", Environmental Science and Technology, American Chemical Society, (July 2014).

requires states and utilities to invest significant resources, that appears to not accomplish what it explicitly sets out to do.

Thank you for the opportunity to comment on this proposed rulemaking. I trust our comments will be considered as the EPA moves forward to address this important air pollutant and environmental matter. If you have any questions regarding our comments, please contact Sushma Masemore, at (919) 707-8700 or sushma.masemore@ncdenr.gov.

Sincerely,



Sheila C. Holman,
Assistant Secretary for the Environment

SCH/adb

cc: Michael Abraczinskas, NCDAQ
Bill Lane, NCDEQ
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