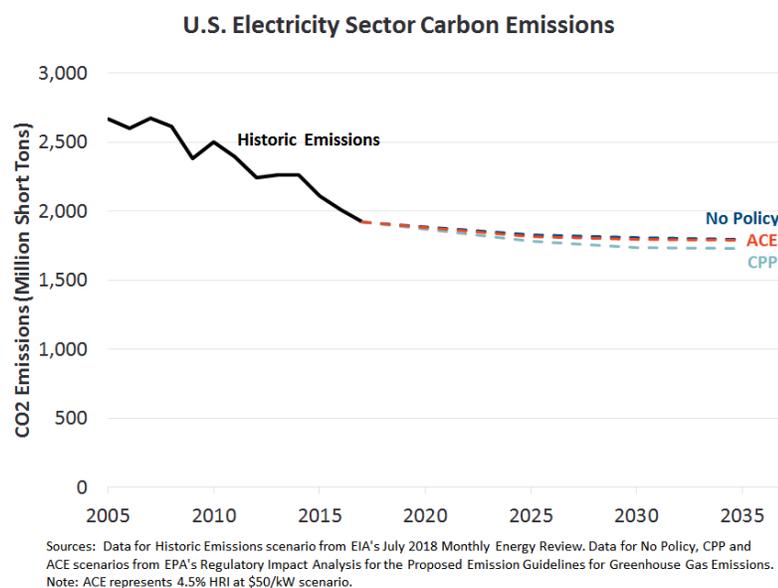


The Brattle Group's Notes on the Affordable Clean Energy Rule

On August 21, 2018, the Trump administration issued a proposal to replace the Clean Power Plan (CPP), which broadly covered carbon dioxide (CO₂) emissions from the entire existing generation fleet, with the Affordable Clean Energy (ACE) rule that features more narrowly-focused guidelines for improving efficiency at existing coal plants. Depending on how states would use their discretion under the proposed rule to set emission standards for specific coal plants, the ACE rule may marginally increase the efficiency of coal plants but will not likely have significant impacts on industry-wide emissions. ACE also changes the New Source Review (NSR) process for plant efficiency projects so that those projects would unlikely be considered a “major modification” that triggers major NSR permitting requirements.

We provide our key observations on the proposed ACE rule below:

- **ACE is not actually an emissions standard.** The EPA identified “Heat Rate Improvements” (HRI) at fossil-fuel steam plants as the “Best System of Emissions Reduction” (BSER) for electric power sector CO₂ emissions. The EPA provided a list of HRI measures and indicated that each measure may provide heat rate improvements ranging from 0.1% to 2.9%. The EPA has left the decision of how to apply these HRIs *at the individual unit level* entirely up to the states, accounting for a multitude of site-specific factors (such as age, size, and useful remaining life) that enable states to factor in the cost of the measures. Therefore, the states will have substantial flexibility to set the required HRIs on a unit-specific basis.
- **The EPA’s analysis indicates minimal impact on CO₂ emissions.** The EPA’s analysis shows that ACE would reduce U.S.-wide emissions by 13 to 30 million tons (MT) in 2025, or by 1% to 2%. That is equivalent to the emissions from six 800 MW plants (about 2% of the total coal fleet) running at 75% capacity factor. It is less than the CO₂ reductions already achieved by many individual states during the period 2006 through 2016: Alabama (31 MT), Georgia (31 MT), Illinois (30 MT), Indiana (43 MT), Ohio (53 MT), and Pennsylvania (45 MT). The EPA’s own analysis shows that the ACE rule will not really achieve any more reductions in CO₂ emissions by 2035 than the continuation of the historical trends since 2005, as shown in the chart to the right.

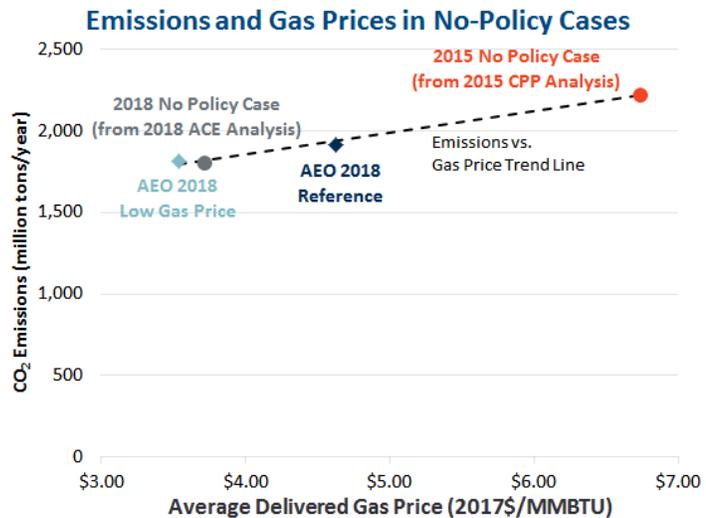


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- **The EPA's estimated (minimal) emissions reductions are likely overstated.** The EPA's analysis assumes that all states would adopt emissions standards that require 2% to 4.5% HRI at every plant. But some states will likely adopt lower HRI requirements for many plants and none at all for some plants, since the states have the discretion to set unit-specific emissions standards. In addition, the potential HRIs may be overstated, since they appear to be based to some extent on potential improvements at inefficient plants that have already retired. If so, the surviving fleet may have already employed some or most of the BSER measures and therefore don't have as much room for improvement.
- **CO₂ emissions could rise because ACE does not prevent substitution of coal for gas-fired generation.** Under the CPP's mass-based compliance option, future CO₂ emissions were capped even if higher future gas prices resulted in increased coal generation and emissions. But the ACE rule could result in running the coal units more (particularly the ones that implemented HRIs) especially if gas prices increased, and may result in increasing the total emissions in the electric sector compared to the No Policy case.
- **The EPA's own analysis shows ACE may be more expensive than CPP.** The EPA claims that ACE is more affordable than the CPP under some scenarios, avoiding \$6.4 billion in compliance costs. However, that conclusion hinges on inconsistent assumptions about the cost of heat rate improvements under CPP vs. ACE. Under consistent assumptions for cost of HRIs (\$100/kW), the EPA's analysis shows the compliance cost under ACE would be \$1.7 to \$3.0 billion *higher* than the costs under CPP. This somewhat counterintuitive result is likely due to the ability under CPP to trade emissions allowances through emission-reduction measures (such as dispatch switching) that are less expensive than implementing HRIs at \$100/kW.
- **ACE proposes a "major modification" of the NSR process.** The EPA gives the states the option to adopt a revised NSR process in order to make it more difficult for efficiency improvements to trigger a "major modification" finding. If a state adopts the revised NSR process, then an hourly emissions increase test that may take the form of "maximum achievable emissions" would be adopted. In that case, HRI projects would not trigger NSR even if the annual emissions increase, since the decrease in CO₂ rate per MWh due to the project would always reduce the hourly maximum achievable emissions. Under current NSR implementation, if an HRI project improves efficiency (and thus reduces variable cost) and that produces an increase in dispatch greater than the efficiency gain (both in percent terms), then the annual emissions would be projected to rise, hence potentially triggering NSR.

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- **ACE does not provide any emissions reductions credits to low-CO₂ resources.** Unlike CPP, the ACE rule does not provide a mechanism (either through credits or higher energy prices) to benefit any low-CO₂ generation technologies, including nuclear, natural gas, and renewables. This may result in greater risks for nuclear retirements and contradict the administration's efforts to prevent retirements of "fuel secure" baseload plants including nuclear. In fact, the EPA RIA study projects that an additional 5,000 MW of nuclear generation will retire by 2030 due to replacing CPP with ACE.
- **EPA's choice of gas price has more emissions impact than the policy itself.** The ACE RIA assumed a \$3.70/MMBtu gas price in 2030, about \$0.90 below EIA's most recent forecast. Our analysis of 2030 emissions and gas prices from the ACE and CPP RIAs and the AEO Reference and low gas price cases shows that the EPA's gas price assumption reduced emissions by about 120 million tons in 2030 – about four times the reductions claimed by the ACE rule under its most optimistic assumptions.



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