
EPA 111(D) FINAL RULE—STAFF ANALYSIS #5: STATE PLANS

TO: Commissioners

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SUBJECT: EPA 111(d)—Staff Analysis #5: State Plans

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CC: PSC Electric

Table 1: Montana’s Goal

Rate-based
<ul style="list-style-type: none">○ Baseline (2012) = 2,481 lb CO₂/MWh○ Interim (2022-2029) = 1,534 lb CO₂/MWh○ Final (2030) = 1,305 lb CO₂/MWh (a 47% reduction)
Mass-based
<ul style="list-style-type: none">○ Baseline (2012) = 17,924,535 tons CO₂○ Interim (2022-2029) = 12,791,330 tons CO₂○ Final (2030) = 11,303,107 tons CO₂ (a 37% reduction)

The EPA’s 111(d) Clean Power Plan rule is designed to reduce carbon emissions from affected fossil fuel electricity generating units (EGUs) by the year 2030. Using a regional approach based on the transmission interconnections (Eastern, Western, and ERCOT), different performance emission rate values were calculated for EGUs falling under two categories: coal plants and natural gas plants.

The EPA determined emissions rates for the regions, based on the total generation and emissions from coal and natural gas units in the 2012 baseline year. Potential reductions that could be achieved by 2030 were calculated for each region through the EPA’s “Best System of Emission Reduction” (BSER), which includes increasing efficiency of existing coal plants, displacing coal-fired generation with natural gas, and increasing renewable resource production. The reductions were applied to the 2012 baseline to determine each state’s interim and final goals.

The most direct way for a state to comply with the rule would be to require all affected EGUs to reduce their emissions rates to the state’s final goal by 2030. As that may not be the most cost-effective or efficient way to comply, the EPA designed the rule to allow states to utilize different compliance plans to achieve their CO₂ reduction goal. These plans result in a package of measures that, when combined, achieve the state’s final goal.

The rule allows states to measure and report their compliance in one of two ways. The first option is a rate-based goal, which measures CO₂ emissions per megawatt hour (CO₂ lb/MWh) for all of a state’s affected EGUs. The second option is a mass-based goal, which measures the amount of CO₂ emissions from affected EGUs in short tons of CO₂ per year.

Montana has nine affected EGUs under this rule, all of which are coal plants.¹ Table 1 at the top of the page outlines Montana's baseline emissions from 2012, the interim goals, and the final 2030 goals for a mass-based and a rate-based approach. Montana has the option to create its own package to comply with the goals, based on either a rate-based or mass-based metric.

Why are the reduction percentages lower for mass-based than for rate-based compliance in Montana?

Adding zero-emitting renewable sources under a rate-based approach could allow affected EGUs to increase carbon emissions while reducing the EGUs' emissions rates. In order to allow the same flexibility under a mass-based approach, the calculation for the mass-based goal was adjusted based on each state's estimated share of the additional regional potential renewable resources not accounted for in the rate-based methodology. A state's share of additional renewable resources is calculated based on the amount of generation from affected EGUs in the state divided by the total amount of generation from affected EGUs in the region.

Why would a state choose a rate-based or a mass-based approach?

A rate-based approach does not limit the total amount of carbon emissions in a state and allows for greater load growth beyond the EPA 2030 projections. This would be beneficial for states with fast growing populations or large industrial growth, as potentially all of their affected EGUs could continue with their baseline emissions rates by obtaining large amounts of renewable resources. Adding renewable resources under a rate-based plan would meet large load growth and simultaneously reduce emission rates from existing fossil generating plants.

A mass-based approach may be preferable to states planning on the retirement of large CO₂ emitters (such as coal plants) without needing to replace the generation from the retired plants. For instance, if Colstrip Units 1 & 2 were retired, the amount of generation capacity that was serving other states would not need to be replaced in Montana.² The mass-based approach also provides states with the flexibility to incorporate measures such as a Renewable Portfolio Standard or Energy Efficiency Resource Standard to reach the state goal (these measures could place some of the burden to meet state goals on public utilities rather than affected EGUs).

Another consideration for states to keep in mind will be participation in a regional trading program. States that adopt a rate-based plan may trade only with other states utilizing a rate-based plan, and states adopting a mass-based plan may trade only with other mass-based states (information on implementing trading programs for 111(d) compliance will be provided in a future staff memo).

¹ Corrette, Colstrip 1, Colstrip 2, Colstrip 3, Colstrip 4, Lewis & Clark, CELP, YELP, and Hardin.

² This scenario would reduce the mass-based emissions, but would have less effect on rate-based emissions since both emissions and energy output would be reduced (the rate-based emissions are a result of emissions per MWh of energy produced by affected EGUs).

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