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EPA's Proposed CO₂ Rule for Existing Power Plants: How Would It Affect Nuclear Energy?

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August 4, 2014 (IN10124)

The Environmental Protection Agency (EPA) published a proposed rule on June 18, 2014, to address CO₂ emissions from existing power plants. Because nuclear power plants directly emit little or no CO₂, a significant policy question is whether EPA's proposed regulations would encourage the growth of nuclear energy or at least the continued operation of existing reactors. The formula in the proposed rule for setting CO₂ goals explicitly accounts for some existing nuclear capacity and reactors under construction, providing a potential incentive for states to try to keep those plants operating. However, EPA's proposed rule allows states to develop their own plans for meeting the CO₂ emission rate goals, making it difficult to predict how nuclear energy might ultimately fare.

The [proposed EPA standards](#) would set state-specific goals for the amount of CO₂ that could be emitted in 2030 for each megawatt-hour (MWh) of electricity generated. EPA projects that, under those proposed emissions rates, U.S. power plants would produce 30% less CO₂ by 2030 than they did in 2005 (the base year in President Obama's [Climate Action Plan](#)).

The unadjusted baseline for the proposed standards was developed by dividing 2012 power plant CO₂ emissions in each state by the amount of electricity generated by fossil fuel-fired plants. In the case of Ohio, which EPA provided as an example, the unadjusted CO₂ emission rate for fossil plants in 2012 was 1,897 lbs./MWh (compared with the average rate for coal-fired plants of about 2,000 lbs./MWh). To develop the 2030 standard, EPA adjusted each state's baseline rate with four groups of actions, or "building blocks," that the agency determined states could reasonably achieve:

- Increase efficiency of existing coal-fired steam units by 6%;
- Replace some coal-fired generation with increased output from underutilized natural gas combined-cycle units;
- Prevent projected losses of 6% of each state's existing nuclear generating capacity, complete five nuclear reactors currently under construction, and increase generation from renewable energy; and
- Implement energy efficiency measures to reduce projected electricity demand.

The nuclear adjustment was made by calculating the projected annual electricity generation from reactors under construction within each state (if any), along with the electricity generated by 6% of each state's existing nuclear capacity, which EPA deems to be at risk of shutdown. These amounts are added to each state's total fossil fuel-fired electrical generation, resulting in a decrease in the CO₂ generation rate per megawatt-hour. (See EPA's [Goal Computation Technical Support Document](#).)

In the Ohio example, the state has no reactors under construction but has two operating nuclear reactors, with total generating capacity of 2,150 megawatts. Six percent of that capacity is projected to generate 993,077 MWh per year, which EPA added to total generation from fossil fuel sources, renewable energy sources, and electricity generation avoided through efficiency measures, as described in the "building blocks." The increase in total electric generation spreads CO₂ emissions among more megawatt-hours, so the rate of CO₂/MWh goes down. The nuclear additions plus the other changes described above result in a proposed 2030 standard for Ohio of 1,338 lbs. of CO₂ per MWh—a 29.5% reduction from the unadjusted baseline.

Although the state standards for CO₂ emission rates would be binding, each state could meet them using whatever mix of options it chose. A state would not have to employ the same "building blocks" in

its compliance plans that EPA used to calculate the standards. According to an [EPA explanation](#), each state "is free to meet that goal in the way that works best for that state. It can rely more or less heavily on specific measures such as efficiency or renewable energy, or even pursue others such as increases in transmission efficiency or new gas generation." Additional nuclear reactors beyond the five already under construction would also be an option.

Because of the state flexibility, the effect of the EPA proposal on nuclear power is inherently uncertain. EPA's emission rate methodology might encourage states to take steps to ensure that nuclear plants currently under construction were completed, and to prevent the shutdown of existing nuclear capacity, because if they did not, they would need to find alternative ways to meet the CO₂ emission rate standard. For example, if Ohio's two nuclear plants closed, the state would lose 993,077 MWh of zero-carbon electricity in its CO₂ rate formula and would need to increase other low-carbon electricity sources or take other steps beyond those already in the EPA building blocks.

The Nuclear Energy Institute, representing the nuclear industry, issued a [statement](#) praising the EPA proposal for recognizing "the need to maintain and expand the use of nuclear energy." However, nuclear industry officials have expressed unhappiness that the nuclear "building block" includes only the 6% of existing nuclear capacity considered to be "at risk," rather than all existing nuclear capacity. According to a [media report](#), the industry is concerned that including only 6% of existing nuclear in the state goal calculations would not provide states with enough incentive to prevent nuclear plants from being shut down and replaced by cheaper gas plants. In the Ohio example, only 993,077 MWh of carbon-free generation would have to be replaced with other options if both the state's reactors were shut down, under the EPA proposal. But if all the state's nuclear electricity were included in the nuclear building block, then 16.95 million MWh (about 9% of the state's total 2012 generation) would have to be replaced if the Ohio reactors shut down (2,150 megawatts operating at 90% of capacity for a year).

On the other hand, a [news release](#) by the Nuclear Information and Resource Service, a group critical of the nuclear industry, contended that EPA's proposed rule "would encourage states to provide ratepayer subsidies for continued operation of nuclear reactors that cannot compete economically in the current electricity marketplace."

For more details, see CRS Report R43652, [State CO₂ Emission Rate Goals in EPA's Proposed Rule for Existing Power Plants](#).

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