policy brief

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The EPA's Proposed Guidelines for Regulating Carbon Dioxide Emissions from Existing Power Plants

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On June 2, 2014, the U.S. Environmental Protection Agency (EPA) proposed guidelines under section 111(d) of the Clean Air Act (CAA) for the control of carbon dioxide (CO_2) emissions from existing fossil fuel–fired power plants. The proposed guidelines are expected to reduce total power sector carbon emissions 30% from 2005 levels by 2030 through the setting of individual emissions targets for each state. States can choose from a range of emissions reduction strategies to develop their preferred approach for achieving their targets.[1] This policy brief provides an overview of the proposed guidelines' key elements.

Background on Federal GHG Regulations

The regulation of greenhouse gas (GHG) emissions under the Clean Air Act stems from a 2007 opinion of the Supreme Court of the United States holding that GHG emissions from new passenger vehicles are subject to CAA regulation.[2] Following the court's decision, the EPA determined that these emissions contribute to air pollution that "is reasonably anticipated to endanger public health and welfare."[3] This finding required the agency to regulate GHG emissions from motor vehicles and triggered GHG permitting requirements for large stationary sources that are new or that undergo a major modification.[4]

In January 2014, the EPA proposed new source performance standards for CO_2 emissions from new fossil fuel–fired power plants.[5] The finalization of those standards will require the EPA to regulate CO_2 emissions from existing fossil fuel–fired power plants under section 111(d) of the CAA, a mandate recognized by the Supreme Court in the 2011 case *American Electric Power v. Connecticut*.[6] The EPA's section 111(d) proposed guidelines include emissions

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1. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Unpublished Proposed Rule) (June 2, 2014) [hereinafter "111(d) Proposal"]; Press Release, U.S. Envtl. Prot. Agency, EPA Proposes First Guidelines to Cut Carbon Pollution from Existing Power Plants (June 2, 2014), http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule (select "Press Release" link).
2. Massachusetts v E.P.A., 549 U.S. 497, 528 (2007).
3. EPA Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,499 (Dec. 15, 2009).
4. Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs (Timing Rule), 75 Fed. Reg. 17,004, 17,006 (Apr. 2, 2010) (interpreting the Clean Air Act to trigger Prevention of Significant Deterioration program permitting requirements to new pollutants when they "take effect"); EPA Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,516 (June 3, 2010).
5. Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1430 (Jan. 8, 2014). The Clean Air Act requires the EPA to finalize new source performance standards within one year of proposal. 42 U.S.C. § 7411(b) (2012).
6. 131 S. Ct. 2527, 2537 (2011) (noting that once the EPA establishes standards of performance for new or modified sources under section 111(b), section 111(d) "then requires regulation of existing sources"). Some commenters question the EPA's authority to regulate the power sector under section 111(d) due to different versions of the section adopted by the U.S. House of Representatives and the U.S. Senate that were not resolved in the final law. William J. Haun, The Federalist Society, the Clean Air Act as an Obstacle to the Envtl. Prot. Agency's Anticipated Attempt to Regulate Greenhouse Gas Emissions from Existing Power Plants, at 9–12 (MAR. 2013), htpp://www.fedsoc.org/publications/detail/the-clean-air-act-as-an-obstacle-to-the-environmental-protection-agencys-anticipated-attempt-toregulate-greenhouse-gas-emissions-from-existing-power-plants. *But see* Megan Ceronsky & Tomas Carbonell, § 111(D) of the Clean Air Act: The Legal Foundation for Strong, Flexible & Cost-Effective Carbon Pollution Standards for Existing Power Plants 3, note 16 (2014); Ann Brewster Weeks, *Essay Responding to Brian H. Potts,* 31 Yale J. On Reg. Online 38 (posted Oct. 20, 2013), http://jreg.commons.yale.edu/essay-responding-to-brian-h-potts/

guidelines, which the agency views as binding for states,[7] and offers guidance on a range of other issues discussed below. After the EPA finalizes the proposed guidelines, each state develops a section 111(d) plan that establishes performance standards and provides for their implementation and enforcement.[8] Each state then submits to the EPA a section 111(d) plan, which the agency approves or denies on the basis of whether the plan satisfies the criteria laid out in the EPA's guidelines. If a state fails to submit a plan or submits a plan that the EPA determines is unsatisfactory, the EPA develops a plan for the state.[9]

The Emissions Guidelines

In its June 2, 2014, proposed section 111(d) guidelines, the EPA assigns each state an interim emissions goal and a final emissions goal for its existing power plants. These state goals are expressed as emissions rates—pounds of CO_2 emitted per megawatt hour (MWh) of net generation. States meet their interim goal through an adjusted average emissions rate—that is, the emissions performance of existing in-state power plants averaged over the 10-year period from 2020 to 2029. Each state must meet its final goal by 2030 and then maintain compliance on a three-calendar year rolling average. States can choose to convert their targets into mass-based standards—limits on total emissions by covered sources—and the EPA gives states instructions on making the conversion.[10]

The proposed guidelines define existing sources as those that were operating or had begun construction on January 8, 2014.[11] Per section 111(d), existing sources are also defined as those that meet parameters specified in section 111(b) regulations for new sources.[12] Sources constructed after January 8, 2014, are considered new sources subject to the new source performance standards.

State Emissions Targets

The Clean Air Act requires that performance standards "reflect the degree of emission limitation achievable through the application of the best system of emission reduction [BSER] which . . . the Administrator determines has been adequately demonstrated."[13] The EPA developed the interim and final state emissions goals on the basis of its definition of the "best system of emission reduction" for CO_2 emissions from existing power plants. The EPA determined the best system of emission reduction to include four categories ("building blocks") of carbon emission-reduction measures:[14]

- Improving efficiency at individual coal–fired units,
- Increasing use of existing natural gas units in place of higher-emitting coal-fired units,
- Generating electricity with low- and zero-carbon units, such as renewable or nuclear energy facilities, and
- Implementing demand-side energy efficiency policies and programs.

The EPA developed assumptions for each building block that serve as the basis for calculating the state-specific emissions guidelines (as explained below). It proposed that all four building blocks taken together constitute the best system of emissions reduction, though it considered (and decided against) defining the best system of emissions reduction only as efficiency improvements at individual units (building block 1). The agency rejected that approach out of concern that state emissions goals based on unit-level efficiency improvements alone could lead to small reductions

(arguing that the EPA is authorized to regulate power plants under section 111(d)).

7. Standards of Performance for New Stationary Sources, 40 C.F.R. § 60.24(c) (2014) (providing that "emission standards shall be no less stringent than the corresponding emission guideline(s)"); 111(d) Proposal, supra note 1, at 327. Some stakeholders argue that the EPA has limited section 111(d) authority. *See e.g.*, N.C. Dept. of Envtl. and Nat. Res., North Carolina § 111(D) Principles 10–11 (2014) (arguing that the EPA can identify what control technologies are "adequately demonstrated" within the fence line of electric generating units but cannot set substantive standards); JON BRUNING, ATTORNEY GENERAL, NEBRASKA, ET AL., 111(D) Whitepaper 6–8 (2013) (asserting on behalf of 18 state attorneys general that the EPA can only set procedural processes for the submission of state 111(d) plans and cannot impose substantive limits on state performance standards) [on file with author].

8. 42 U.S.C. § 7411(d)(1) (2012).

9. § 7411(d)(2).

10. 111(d) Proposal, *supra* note 1, at 621–23.

11. Id. at 129.

12. Existing units are subject to section 111(d) only if they would be subject to new source performance standards were they new sources. § 7411(d)(1). Parameters include actually supplying " 'more than one-third of its potential electric output' to the grid" and built "for the purpose of supplying 'more than 219,000 MWh' . . . net-electrical output to the grid." Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1403, 1445–46 (Jan. 8, 2014).

13. 42 U.S.C. § 7411(a)(1)(2012).

14. 111(d) Proposal, *supra* note 7, at 153.

in CO_2 emissions given increased operation of coal units with upgraded efficiency.[15] The agency justified inclusion of building blocks 2 through 4 because they are technically feasible, can be implemented at reasonable cost, and result in greater CO_2 reductions than can be achieved through heat rate improvements alone.[16] Further, the EPA concluded that states already use these measures to reduce carbon emissions and that the BSER determination ensures reliability of the electricity system.[17]

To develop each state's interim and final emissions goal, the EPA applied the building blocks to each state's fossil emissions and generation for 2012.[18] In particular, it made adjustments to the numerator (emissions) and denominator (generation) of each state's average 2012 emissions rate from fossil fuel–fired power plants. For building block 1, the EPA reduced 2012 CO_2 emissions from coal-fired generation by 6%.[19] For building block 2, the EPA assumed dispatch shifts up to the level at which existing natural gas combined cycle (NGCC) plants run at 70% of capacity. The EPA increased 2012 natural gas emissions to reflect this level of utilization and then proportionally decreased coal- and oil-fired emissions.[20]

Next, the EPA applied building blocks 3 and 4 to adjust the denominator (MWhs). Here, the EPA began with 2012 generation from affected units and added estimates of renewable, nuclear, and energy efficiency capacity. Building block 3 consists of zero-emitting generation, including non-hydro renewables and nuclear power. Renewable energy assumptions and growth factors are based on the year 2020 average renewable portfolio standard of states in the same region and each state's 2012 generation.[21] Nuclear estimates reflect the amount of capacity under construction in each state and 6% of a state's existing 2012 nuclear capacity (to reflect existing capacity at risk of retirement), operated at a 90% utilization rate.[22] Finally, to apply building block 4 (demand-side energy efficiency), the EPA estimates the total MWh amount by which each state's affected electric generating unit (EGU) generation would be reduced each year assuming that energy efficiency programs result in an annual incremental energy savings of 1.5%.[23]

The EPA computed each state's goals using the following formula:[24]

$$\frac{\text{Total adjusted CO2 emissions for affected units (after applying blocks 1 and 2)}}{\text{Total net generation for affected units + annual net generation for renewable and nuclear (block 3) + estimated cumulative MWh saved through energy efficiency (block 4).}}$$

The EPA performed these computations separately for each year in the 2020–2029 period. The interim goal is the simple average of annual emissions rates computed for each of those years, and the final state goal is the rate computed for year 2029.

Compliance Options

The proposed guidelines give states a great deal of flexibility in how they achieve their assigned emissions goals. States could use measures included in the building blocks (heat rate improvements, dispatch shifts, renewable energy,

15. *Id.* at 251.
16. *Id.* at 254–55.
17. *Id.* at 320.
18. *Id.* at 350. The EPA also added estimates for affected units under construction.
19. *Id.* at 351–52. For each state, the EPA used broad assumptions about the level of emissions reduction achievable through application of each building block.
20. *Id.* at 352.
21. *Id.* at 199.
22. *Id.* at 353.
23. *Id.* at 354–44. For states that are net importers of electricity, the EPA adjusted the MWh reduction downward to reflect the fact that some of the generation and emissions reductions associated with in-state energy efficiency programs would reduce out-of-state emissions.
24. The EPA divided the total adjusted CO_2 emissions for affected units (after applying building blocks 1 and 2) by (1) the total net generation for affected units plus (2) annual net generation for renewable and nuclear (building block 3) plus (3) the estimated cumulative MWh saved through energy efficiency (building block 4). Id. [(Coal gen. x Coal emission rate) + (Oil/Gas gen. x Oil/Gas emission rate) + (NGCC gen. x NGCC emission rate) + "Other" emissions] / [Coal gen. + Oil/Gas gen. + NGCC gen. + "Other" gen. + Nuclear gen. + RE gen. + EE gen.].

demand-side energy efficiency) as well as other measures such as fuel-switching, partial carbon capture and storage, new NGCC generation, efficiencies in electricity transmission and distribution, and biomass co-firing.[25]

The proposed guidelines identify a number of possible state approaches to achieving emissions goals. Some states may choose to place the entire compliance obligation on power plants, such as under a trading program that requires electric generating units to achieve a certain adjusted emission rate or hold emission credits for each ton of CO_2 emitted.[26] Other states may wish to use a "portfolio approach," in which the state plan includes performance standards for covered power plants as well as other measures.[27] Under this approach, the combined effect of all measures would achieve the state interim and final emissions goals. The EPA seeks comment on additional approaches that would keep the entire compliance obligation from falling on electric generating units, that would place a compliance obligation on the state, or that would include measures in a state plan without rendering them federally enforceable.[28]

Multi-State Cooperation

In recognition of the potential of multi-state partnerships to provide relatively low-cost reductions, the EPA permits states to jointly demonstrate CO_2 emissions performance by combining their individual state emission goals. When using a mass-based standard, the multi-state performance level is the total CO_2 emissions of affected electric generating units in participating states. Under a rate-based standard, the performance level is a weighted average emissions rate to be achieved by all affected electric generating units in those states.[29] The agency allows a two-year extension on the submission deadline for states developing a multi-state plan.[30] Multi-state plans would need to meet the requirements set forth for individual state plans, but the EPA proposes that only one multi-state plan would be submitted on behalf of all participating states.[31]

State Plan Requirements

The EPA will evaluate the sufficiency of a state plan on the basis of how the plan addresses 12 required components:

1. A state plan must identify the affected entities.
2. The plan must describe its approach and geographic scope.
3. It must identify the state emissions performance level, adopting either the rate-based goal set by the EPA or a mass-based goal.[32]
4. It must show that it can achieve the required emissions levels.
5. It must establish milestones.
6. It must include corrective measures for milestone shortfalls.
7. It must identify the emissions standards and all other measures.
8. It must demonstrate that its methods are quantifiable, verifiable, permanent, and enforceable.
9. It must identify requirements for recordkeeping and reporting.
10. It must describe plans for state reporting.
11. It must provide proof of a state hearing.
12. It must provide material supporting its components.[33]

The EPA also evaluates the plan against four criteria.[34] First, the plan must contain enforceable measures that reduce CO_2 emissions among affected sources. Second, projections must show that these enforceable measures will achieve

25. *Id.* at 238, 502.
26. *Id.* at 385.
27. These other measures, such as renewable energy and demand-side energy efficiency, may involve compliance obligations on entities that are not electric generating units (e.g., electricity distribution utilities). *Id.* at 382.
28. *Id.* at 379–88.
29. *Id.* at 438, 616.
30. *Id.* at 115–16.
31. *Id.* at 434. The EPA seeks comment on two additional approaches to multi-state planning. Id. at 435–36.
32. *Id.* at 436–37.
33. *Id.* at 442–55.
34. *Id.* at 425.

emissions performance equivalent to or better than the applicable state-specific CO_2 goals on a timeline equivalent to that in the emissions guidelines. Third, each CO_2 reduction measure in the plan must be quantifiable and verifiable.[35] Fourth, the state plan must include a process for annual reporting to the EPA of plan implementation (at the level of the affected entity) and must provide for corrective measures in the event the plan fails to achieve projected emissions reductions.[36]

Implementation Timeline

The EPA expects to issue final section 111(d) guidelines by June 2015, and it will finalize the performance standards for new, modified, and reconstructed units by that date. The deadline for submission of state 111(d) plans is June 30, 2016, though states may request an extension by April 1, 2016. Extension requests must state why more time is needed, outline the state's current actions to develop a plan, and provide a plan for achieving timely completion of the state plan. States generating an individual state plan can seek a one-year extension (to June 30, 2017). Those entering into a multi-state arrangement are eligible for a two-year extension (to June 30, 2018).[37] At the end of 2029, states must meet their interim goal as the average of 2020–2029 emissions. They must meet their final emissions goal on a three-year rolling average basis (i.e., 2030–2032, 2031–2033, 2032–2034, and so on). The EPA will evaluate compliance beginning in 2033.[38]

35. *Id.* at 431.
36. *Id.* at 432.
37. *Id.* at 115–16.
38. *Id.* at 622–23.