

THE CLEAN POWER PLAN AND MARKET OPTIONS FOR COMPLIANCE



Over the next year, states will be working with stakeholders to submit plans to implement the new federal Clean Power Plan and submit comments on the U.S. Environmental Protection Agency's (EPA) proposed federal implementation plan and model rules. In its final Clean Power Plan, EPA has shown strong support for market-based approaches to reduce emissions and has granted states significant flexibility to implement market options. This document provides an overview of the Clean Power Plan and highlights aspects of the rule that warrant close attention from a market readiness perspective.

THE CLEAN POWER PLAN

On August 3, 2015, EPA finalized the Clean Power Plan, which sets greenhouse gas emission performance standards for existing power plants in the contiguous United States. The standards are equivalently expressed as (1) emission rate goals for individual electric generating units (EGU), (2) weighted average emission rate goals for the state, and (3) absolute mass-based emission goals for the state. The standards are set at an intermediary level in 2022 and decrease through 2030, after which they remain unchanged.

As with most stationary source Clean Air Act regulations, states are tasked with creating implementation plans to meet the EPA-set goal. If states are unable or unwilling to do so (or if EPA determines their plan won't achieve the goal), EPA will implement a federal plan (or backstop standard).

States must develop and submit an implementation plan in which they select one of the above-mentioned expressions of the goal and demonstrate how they will enforce compliance with this goal by affected EGUs in their jurisdiction. States must submit their plans by September 6, 2016, or if they need more time, make an initial submittal by this date and submit a final plan by September 6, 2018. Compliance under the Clean Power Plan occurs

over different periods beginning in 2022. Though states are tasked with designing plans and administering them, compliance is entirely on EGUs.

IMPLEMENTATION OPTIONS

States can implement emission goals through two types of plans: emission standards or state measures. An emission standards type would be any plan that covers only affected EGUs or other specific types of activities identified by EPA as being eligible to receive credit (e.g., renewables, energy efficiency, nuclear). A state using an emission standards type plan can define its performance goal in any one of the three ways discussed above, namely individual EGU performance rate, statewide emission rate, or statewide mass rate. A state measures type would be any plan that demonstrates equivalent reductions via programs outside of affected EGUs (e.g., renewable portfolio standards or economy-wide cap-and-trade programs).

EMISSION STANDARDS APPROACH

If a state chooses to implement a statewide rate-based plan, all affected EGUs in the state will be in compliance if they meet a specified emission rate, expressed in pounds of carbon dioxide per megawatt-hour (lbs CO₂

per MWh). If an EGU has an emission rate higher than the EPA-defined performance goal, it can lower the rate by either investing in on-site technologies to reduce emissions (e.g., efficiency improvements, addition of on-site renewable generating capacity for ancillary services, carbon capture) or procuring emission rate credits (ERCs). An ERC is a verified MWh of renewable electricity generation, new and expanded nuclear generation or reduced electricity demand coming from a qualified renewable or energy efficiency project. An ERC serves to lower the emission rate of an EGU and is surrendered as part of compliance. ERCs can also be issued to EGUs that emit under the performance goal. Trading of ERCs allow all EGUs in a state or potentially multiple states, to meet their goal *in aggregate*, even though individual EGUs may still be emitting above the standard. A rate-based standard poses no limit on the amount of electricity that can be produced, so long as it can be produced by power plants that meet or exceed the emission goal.

If a state chooses to implement a mass-based plan, it would distribute allowances equal to the amount of carbon allowed by the statewide mass standard. An allowance is equal to one short ton of CO₂. An EGU will be in compliance if it surrenders allowances equal to its emissions, in absolute terms. Measures like energy efficiency and renewable energy generation would lower the overall number of allowances an EGU would need to procure by reducing the demand for electricity from fossil-fuel sources.

STATE MEASURES APPROACH

A state could choose an alternative approach, whereby it meets its goal through a measure or measures that primarily target unaffected entities. This option may only be implemented to achieve a statewide mass-based goal. Possible market-based policies under this approach are a carbon tax, a renewable portfolio standard, or an economy-wide cap-and-trade program.

Because these policies are not inherently convertible to one of the three expressions of the Clean Power Plan performance standard, states must demonstrate to EPA that this plan would achieve equivalent reductions *at affected EGUs*. In other words, EGUs operating under a state measures plan must achieve at least as many reductions as they would under an emission standards plan. States must also include a federal backstop in a state measures

plan that would allow EPA to ensure that affected EGUs are in compliance if the state measures fail to achieve equivalent reductions. The backstop could be the proposed federal implementation plan discussed below, though it need not be.

PROPOSED MODEL RULES

EPA proposed two model trading rules in conjunction with the final Clean Power Plan—a rate-based approach and a mass-based approach—each of which could be implemented by a state. Each of the proposed model rules is designed for interstate trading, alleviating the time pressure on states interested in using market-based mechanisms for compliance. If a state chooses to submit a “trading-ready” state plan—whether or not the state adopts the model trading rule—its EGUs will be automatically brought into a trading program with EGUs in other states that use the same EPA-designated tracking system.

The model rules would lower the costs a state might face in designing its own market-based approach. EPA also says plans based on the model rules, when finalized, would be “presumptively approvable,” which reduces uncertainty for businesses in states that choose to implement a model rule.

The first rule EPA outlines is a rate-based model rule. For each subcategory of power plants—steam generators (usually coal plants) and natural gas combined cycle plants (NGCC)—the proposed model rule would set an emission rate equal to the emission performance standard finalized in the Clean Power Plan. Under the proposed model rule, ERCs would be issued to four sources: renewable electricity projects (wind, solar, geothermal, or hydro), nuclear (new and expanded capacity), existing EGUs that perform better than the standard for their subcategory, and NGCC-generation representing incremental generation at existing plants. The latter category would be pro-rated relative to a 2012 baseline and represents the decrease in emissions due to shifting from fossil steam generation to NGCC generation.

The second proposed rule is a mass-based model rule. The state would distribute allowances equal to its statewide mass limit and would choose its allocation approach. The model rule would allocate allowances—minus three allowance set-asides of pre-determined volume—to EGUs based on historical data. The set-asides

would be allocated to (1) projects in the Clean Energy Incentive Program (see Additional Information section for a description), (2) in-state renewables, and (3) existing combined cycle power plants; the latter two to address leakage. In the context of the Clean Power Plan, EPA defines leakage as a shift in generation from existing power plants to new power plants that are not covered by the plan because they are covered separately under Section 111(b) of the Clean Air Act. Affected EGUs would surrender allowances at the end of each multiyear compliance period (2022–2024; 2025–2027; 2028–2029; and starting in 2030, every two years thereafter).

EPA will be accepting comments on the model rules and intends to finalize both by next summer, before states are required to submit their plans. In addition, EPA proposed two federal plans, a rate-based approach and a mass-based approach, which are largely the same as the two model trading rules. EPA would implement a federal plan in any state that does not submit its own approvable plan. A state could also in practice “opt in” to a federal plan by not taking any action to submit an initial or final plan by September 6, 2016.

It is widely recognized that a broader trading program (e.g., one including multiple states) results in lower overall compliance costs. One advantage of a federal plan/model rule that embraces trading is that it facilitates interstate trading of allowances or credits between states that choose to participate in interstate trading and among states where EPA implements a federal plan.

KEY ELEMENTS FOR MARKET READINESS

The proposed model rules directly address many of the necessary elements of interstate trading, and states may choose to adopt a model rule as a “trading-ready” plan, and indeed both proposed federal plans are trading ready. States may still choose the model rule, however, and independently implement market design elements suited to their own circumstances. Following are key areas state policymakers would need to consider:

TRACKING

A robust tracking system is needed to ensure that allowances or ERCs are counted once (and only once) to protect the financial assets (i.e., allowances or credits) of market participants, facilitate trading, and demonstrate

compliance. Several tracking systems are already in use across the country, for example the registry used to track Regional Greenhouse Gas Initiative (RGGI) allowances and the Western Renewable Energy Generation Information System (WREGIS) that tracks renewable energy credits in the Western power grid.

In principle, allowances and credits would be tracked in the same way, and a single system could track both kinds of compliance units for multiple states. EPA has offered to administer such a tracking system for states. Trading (either intrastate or interstate) would be straightforward within the same tracking system and should also be possible between an EPA-administered system and an independent system that is interoperable with EPA’s system.

EVALUATION, MONITORING, VERIFICATION

EPA identifies many requirements for evaluation, monitoring, and verification (EM&V)—steps needed to guarantee the environmental integrity of the market-based compliance options and allow trading. The requirements differ for each approach.

For a mass-based approach, the requirements are relatively simple. Affected units must monitor and report their greenhouse gas emissions, which they already do under separate EPA authority. State plans can include provisions for new renewable generation and improved demand-side energy efficiency, but since these efforts would directly lower power plant emissions (by increasing zero-emitting generation or lowering fossil generation, respectively) they do not need separate EM&V under the Clean Power Plan. States or utilities may still insist on their verification requirements for these programs, for example to evaluate cost effectiveness, but EPA is not requiring it.

For a rate-based approach, affected generators must monitor and report both their emissions and their net electricity output, since their compliance obligation is expressed in lbs CO₂ per MWh. For states that include trading of ERCs—as is allowed under the model rule—EM&V standards will be necessary for eligible renewable or energy efficiency projects. For renewable electricity projects, the standards will need to demonstrate that the project is actually generating electricity. Energy efficiency projects will need to demonstrate that they achieve reductions in electricity demand, and quantify these

reductions against a baseline. EPA proposed guidelines for the exact verification steps these would entail, and will be taking comment on these issues.

LINKAGE

Linkage allows the trading of allowances or ERCs across jurisdictional borders. EPA highlights the cost advantages of broad linkage and provides significant flexibility for states to link. Either mass-based or rate-based states may link with each other, though linkage between the two types of plans is not allowed. The strongest permitted linkage is a multi-state approach where states submit a single implementation plan. In this case, states would have agreed in advance on all aspects of their plan design. States may also participate in a multi-state plan, but submit individual implementation plans. Alternatively, states could select a “one-way” linkage whereby they implement their own plan but permit allowances or credits from other states to be used for compliance.

Finally, states could choose to submit a trading-ready plan (whether adopting the model rule or not) that would be explicitly linked with all other trading-ready states that use the same EPA-designated tracking system. EPA also proposed linkages between trading-ready states that use EPA’s tracking system and states in which the proposed federal plan was implemented.

Linkage has numerous cost advantages for affected EGUs. It allows them to avoid expensive upgrades if cheaper reductions are available elsewhere in the electricity system. Those EGUs that do undertake reduction measures gain financial assets in the form of tradable allowances or ERCs. Because it is the total amount of carbon dioxide in the atmosphere, and not the geographic location of it, that drives climate change, allowing reductions to happen anywhere in the country still achieves the environmental objective of the regulation.

The Clean Power Plan recognizes these cost-saving opportunities and allows broad flexibility for states to link, so it is likely that all states choosing a market-based approach will be linked with at least one other state to some degree.

ALLOCATION

States that choose a mass-based plan have one additional key design option: allowance allocation. Under any cap-and-trade program, allowances may be allocated (distrib-

uted) for free or via auction, though in practice a combination of the two is typical. Allowances may also be set aside in reserve as a means to finance desired programs or serve other purposes (e.g., cost containment). While the means of allocation does not alter the market price for emission reductions, it does significantly alter the compliance cost that businesses face under the program.

In the proposed mass-based model rule, EPA proposes free allocation to affected EGUs, with the set-asides described above. A state choosing to adopt the model rule may choose how to distribute allowances and isn’t limited to EPA’s proposed allocation approach. Freely distributed allowances lowers compliance costs for affected units, lowers electricity prices for consumers, and eases competitiveness concerns, all relative to the case of full auctioning. On the other hand, full auctioning can allow governments to redirect revenues from the auction to other policy goals (ranging from building climate resilience among low-income communities to offsetting corporate tax rates) and can result in net economic gains, as has been shown in the RGGI states.

ADDITIONAL INFORMATION

CLEAN ENERGY INCENTIVE PROGRAM

Concurrent with the final Clean Power Plan, EPA is proposing the Clean Energy Incentive Program (CEIP), which would provide credits or allowances to eligible renewable energy projects or energy efficiency programs in low-income communities. These credits or allowances could be used for compliance under the Clean Power Plan, giving them value in the market and providing a novel revenue stream for projects.

Eligible renewable energy projects are defined as “any type of wind or solar” that starts construction after the state submits its final plan. If a project is not located in a particular state but still benefits a state—presumably an out-of-state renewable energy project with a power purchase agreement with an in-state electricity provider—then the project would receive CEIP units from that state’s share of matching units (rather than the project’s host state).

Eligible energy efficiency projects must be located in low-income communities and result in independently verified electricity reductions. They are also only eligible if they begin after a state’s final plan is submitted. EPA is

taking comments on both the definition of a low-income community for this program and the exact details of the verification process.

An eligible CEIP project would receive a number of units for every year 2020-2021 in which it is in operation, so if a project is in operation by 2020 it can receive units for year 2020 and year 2021. Renewable energy projects would receive one full unit per MWh generated (half from the state, half from EPA), and energy efficiency programs would receive two full units (one from the state, one from EPA) per MWh saved.

MARKET MECHANISMS OVERVIEW

Broadly speaking, a market-based mechanism to reduce greenhouse gases is one in which emissions are somehow priced, allowing the market to discover the least-cost means of reducing emissions. The price can come through the relative scarcity of allowances or credits or via a direct state-administered fee. Any of these options is permitted as a possible compliance option under the Clean Power Plan, so long as it achieves the required reductions. More detail on these concepts can be found in our brief *Market Mechanisms: Understanding the Options*¹.

Mass-based trading system

A mass-based trading system, typically referred to as cap-and-trade, sets an absolute limit on emissions, requires entities subject to the system to hold sufficient allowances to cover their emissions, and provides broad flexibility in the means of compliance. Entities can comply by undertaking emission reduction projects at their covered facilities and/or by purchasing additional emission allowances. Sellers of allowances may include the government through allowance auctions or other entities that have reduced emissions below the amount of allowances held.

Rate-based trading system

A rate-based trading system also allows for broad flexibility in compliance, but the traded unit is a credit, not an allowance, and the constraint is on emissions per unit of output. This approach is sometimes known as a baseline-and-credit program. Firms that emit below the performance standard (baseline) would be able to create credits and sell these to firms that emit above the stan-

dard. With this rate-based approach, entities can comply by reducing their own emissions intensity or by buying credits from other firms.

Carbon Tax

A carbon tax places a fee on fossil fuels proportional to their carbon content. The fee discourages the use of fossil fuels and boosts the price competitiveness of non-emitting energy sources. While it does not set an emissions limit, and therefore does not provide the environmental certainty of a mass-based trading system, it does provide price certainty to businesses and consumers because the level of the fee is set in advance.

Renewable Portfolio Standard

Under a renewable portfolio standard (RPS), utilities are required to procure a certain percentage of their total electricity from renewable sources. Renewable generators create Renewable Electricity Credits (RECs) equal to their generation and then sell these to utilities that surrender them for compliance. Regulators define the type of renewables that can generate RECs or add “carve-outs” to ensure a minimum level of generation from a preferred source. This policy does not set an emissions limit, nor does it assure a certain price for RECs.

Other C2ES Resources:

Key Insights from a Solutions Forum on Carbon Pricing and Clean Power, April 2015

Q&A: EPA Regulation of Greenhouse Gas Emissions from Existing Power Plants, August 2015

Q&A: EPA's Federal Implementation Plan, August 2015

Carbon Pollution Standards resource webpage
<http://www.c2es.org/federal/executive/epa/clean-power-plan>

ENDNOTES

1 Center for Climate and Energy Solutions, *Market Mechanisms: Understanding the Options* (Arlington, VA: Center for Climate and Energy Solutions, 2015), <http://www.c2es.org/publications/market-mechanisms-understanding-options>.



The Center for Climate and Energy Solutions (C2ES) is an independent, nonprofit, nonpartisan organization promoting strong policy and action to address our climate and energy challenges. The C2ES Solutions Forum brings together businesses, states, and cities to expand clean energy, reduce greenhouse gas emissions, and strengthen resilience to climate change.