



Options for Implementing the Clean Power Plan in Virginia

Basic Elements of the Clean Power Plan

On August 3, 2015, the Environmental Protection Agency (EPA) released its Clean Power Plan (CPP) final rule, designed to reduce carbon dioxide (CO₂) emissions from existing fossil fuel-fired power plants. According to EPA, fossil fuel-fired power plants are by far the largest source of U.S. CO₂ emissions, making up 31 percent of U.S. total greenhouse gas emissions. When fully implemented in 2030, the CPP is projected to reduce carbon pollution from the power sector by 32 percent below 2005 levels.

The CPP sets limits, called CO₂ emission performance rates, that reduce the amount of carbon pollution allowed. Interim CO₂ emission performance rates are to be achieved during the period 2022-2029, and final CO₂ emission performance rates are to be achieved by 2030. Separate interim and final limits apply to two subcategories of power plants: fossil fuel-fired electric steam generating units (coal- and oil-fired power plants), and natural gas-fired combined cycle generating units.

States have the opportunity to develop and implement plans that ensure that power plants within their borders achieve the interim and final emission performance rates. If a state does not submit an acceptable plan, EPA will implement a federal plan for the state. To provide flexibility in implementing the CO₂ limits, EPA established interim and final goals for each state in three forms, explained further below:

- A rate-based state goal measured in pounds per megawatt hour (lb/MWh),
- A mass-based state goal measured in total short tons of CO₂, and
- A mass-based state goal with a new source complement measured in total short tons of CO₂.

A **rate-based plan** looks at the rate of emissions in pounds of CO₂ emitted per megawatt-hour of electricity generated (lbs/MWh). In a rate-based plan, the state establishes an allowed emission rate for its power plants. At the end of the year, a power plant owner must show that the plant's effective emission rate was equal to or less than the rate-based limit for that year. If actual emissions from the plant exceed the rate-based limit, the owner must use Emission Rate Credits (ERCs) to bring its effective emission rate down to the limit.

A power plant owner can obtain ERCs through programs that improve energy efficiency (thereby lowering energy consumption) or by generating energy from non-polluting sources like wind or solar energy (thereby displacing energy generated from polluting sources). The state

will issue one ERC for each megawatt-hour of electricity saved through energy efficiency or generated by clean energy. The power plant owner can combine the megawatt-hours from its ERCs with the megawatt-hours actually generated at its plant and divide that sum into the pounds of CO₂ generated, thereby lowering the plant's effective emission rate to the applicable limit. An owner can create ERCs by implementing its own energy efficiency programs or clean energy, or it can buy ERCs created by others.

ERCs are needed in a rate-based plan because reducing the *amount* of electricity generated from an existing power plant (by improving energy efficiency or partially substituting clean energy) will not affect the *rate* of CO₂ emissions for that plant. Fewer overall pounds of CO₂ will be emitted, but the amount of CO₂ *per megawatt-hour* will remain the same, and that's what a rate-based plan measures. (By analogy, driving a car fewer miles will save on total gas consumption, but will not affect the car's mpg rate.) ERCs are a mechanism for taking into account the beneficial effects of energy efficiency measures and clean energy in reducing overall CO₂ emissions.

A **mass-based plan**, by contrast, looks at total CO₂ emissions, not the rate of emissions. In a mass-based plan, the state creates a permit, called an allowance, for each ton of carbon pollution that power plants will be allowed to emit in the coming year. It then distributes these allowances. At the end of the year, a power plant owner must submit to the state the number of allowances equal to its carbon dioxide emissions: if a power plant emitted 500 tons of CO₂ that year, its owner must give the state 500 allowances.

States have flexibility in how they distribute allowances. Allowances could be given to power plant owners for free, or they could be sold at auction. Selling allowances would generate funds that could be used to benefit impacted communities, workers, or consumers, or to promote energy efficiency or clean energy. A state could also set aside a certain number of allowances for a specific goal. For example, some allowances could be given directly to energy efficiency providers and clean energy developers to sell in order to raise funds for their projects.

Since a mass-based plan looks only at the quantity of CO₂ emitted (and not the emission rate), every ton of carbon pollution avoided by improving energy efficiency or adding clean energy directly reduces the number of allowances needed, and there is no need for ERCs to account for the beneficial effects. As with ERCs, however, a power plant owner can save on allowances by implementing its own energy efficiency programs or clean energy, or it can buy allowances from others.

EPA's analysis shows that, overall, a mass-based approach to emission reduction is much less expensive to implement than a rate-based approach (\$5.1 billion vs. \$8.4 billion nationwide in 2030). However, one potential problem with a mass-based plan is what's called leakage, situations where the CPP carbon reduction goals might be undermined by shifting power generation from an *existing* plant (whose CO₂ emissions are covered by the CPP limits) to a *new* fossil fuel-fired plant (whose CO₂ emissions are not covered by those limits). By making this

shift, the power plant owner would save on allowances needed for the existing plant, but overall CO₂ emissions may be reduced little if any. For this reason, states using a mass-based approach must include provisions in their plans to address any emissions leakage potential.

One option for addressing the potential for leakage is for the state to adopt a **mass-based plan with a new source complement**. Such a plan would cover both existing and new power plants, but would otherwise function the same as a mass-based plan described above. If a state chooses this route, EPA says, its state planning requirements are streamlined, avoiding the need to meet additional plan requirements and include additional elements.

The following table shows EPA’s interim and final goals for Virginia, for each of the three types of plans:

VIRGINIA			
	CO ₂ Rate (lbs/MWh)	CO ₂ Emissions (short tons)	
2012 Historic	1,477	27,365,439	
2020 Projections (without CPP)	959	26,433,868	
	Rate-based Goal	Mass-based Goal (annual average CO ₂ emissions in short tons)	Mass Goal (Existing) & New Source Complement
Interim Period 2022-2029	1,047	29,580,072	30,030,110
Interim Step 1 Period 2022-2024	1,120	31,290,209	31,474,885
Interim Step 2 Period 2025-2027	1,026	28,990,999	29,614,008
Interim Step 3 Period 2028-2029	966	27,898,475	28,487,101
Final Goal 2030 and Beyond	934	27,433,111	27,830,174

EPA allows states to set their own milestones for Interim Step Periods 1, 2, and 3, as long as the state plan demonstrates how those interim step milestones, as well as the interim and final goals, will be achieved.

Three other aspects of the CPP deserve mention: interstate emissions trading, the Clean Energy Incentive Program, and public participation in the development of state implementation plans.

One way for states to meet their emission reduction goals is through **interstate emissions trading**, which may lower costs. A state can join an existing market-based trading program, such as the Regional Greenhouse Gas Initiative (RGGI), which covers nine states in the northeast and mid-Atlantic area. Or a state can develop a “trading-ready” CPP implementation plan, under which power plants can use out-of-state reductions—ERCs or allowances, depending on the type of plan—to achieve required CO₂ reductions, without the need for up-front interstate agreements like RGGI. A state plan is trading-ready if it meets certain requirements, such as having an EPA-approved tracking system.

The optional **Clean Energy Incentive Program** (CEIP) is an EPA initiative to encourage early investments in energy efficiency and wind and solar energy. As shown in the table above, the interim compliance period under the CPP does not begin until 2022; but if a state chooses to participate in the CEIP, it can award ERCs or allowances to qualified providers that reduce end-

use energy demand or generate clean energy during 2020-2021. For energy efficiency projects to qualify, they must serve low-income communities, and both energy efficiency and clean energy projects must begin after the state submits its final implementation plan. As an added bonus, EPA will provide matching ERCs or allowances to states that participate in the CEIP, up to an amount for all states equal to the equivalent of 300 million short tons of CO₂ emissions. Wind or solar projects will receive one credit or allowance for each MWh of clean power generation, while energy efficiency projects in low-income communities will receive two credits or allowances for each MWh of power generation saved.

Finally, the CPP final rule requires states to provide opportunities for **public participation** in the formulation of state implementation plans. States must demonstrate how they are actively engaging with various communities, particularly low-income communities, minority communities, and tribal communities. This requirement will provide an avenue for all communities to hear from the state about strategies that might work best to tackle climate pollution, and to provide input on where possible impacts to low-income communities, minority communities, and tribal communities could occur, along with strategies to mitigate those impacts.

Implementation Options for Virginia

This section summarizes what various interest groups are recommending for Virginia's implementation plan under the CPP.

The **Natural Resources Defense Council (NRDC)** urges "adoption of a flexible, market-based framework in combination with complementary state clean energy policies [that] will allow Virginia to cost-effectively meet its carbon pollution limit, largely by expanding renewable wind and solar energy and improving the energy efficiency of its buildings and industry." Specifically, NRDC favors a mass-based approach with a new source complement, with allowances to be auctioned to emitters and the revenues used for worker retraining, investments in energy efficiency, and direct electric bill assistance to low-income customers. NRDC also favors using a regional approach to trading in emission allowances to reduce costs.

NRDC notes that Virginia has established voluntary energy efficiency and renewable energy goals for its utilities. If these goals are met, utilities will reduce energy waste by 10 percent of their 2006 sales by 2022, and will generate 15 percent of their 2007 sales from renewable sources by 2025. According to NRDC, achieving this modest efficiency goal and even just half of the renewables goal would put Virginia's power plants in full compliance with their 2030 emissions limits.

NRDC says that Dominion Virginia Power is advocating a rate-based approach, which would allow it to keep adding fossil fuel-burning power plants, as long as they are cleaner. But what is needed, NRDC says, is a mass-based plan that caps total emissions from existing and new power plants, driving investments in renewable energy and energy efficiency.

The **Sierra Club** likewise emphasizes the need for energy efficiency and renewable energy to provide economic value for consumers and create local jobs and investment. It observes that Virginia lags behind most other states in both areas. Virginia’s energy companies want to continue building expensive power plants fueled by fracked natural gas; but “it is critical that the state put efficiency and renewable energy first, and address both new and existing power plants in the implementation plan,” the Sierra Club says.

The **Union of Concerned Scientists (UCS)** argues that “a combination of strong renewable energy and energy efficiency policies and a robust [multistate] carbon emissions–trading program would provide a cost-effective pathway for the Commonwealth to cut carbon emissions, charting a course toward a clean energy future that delivers significant health and economic benefits for all Virginians.” Like NRDC, UCS supports a mass-based plan that includes CO₂ emissions from both new and existing power plants. It finds that, by auctioning carbon allowances, Virginia could generate \$241 million in average annual revenue from 2022 to 2030, with the revenue being used for

- building resilient infrastructure in coastal areas vulnerable to sea level rise and flooding;
- supporting renewable energy development and energy efficiency investment;
- assisting low-income and environmental justice communities; and
- supporting economically distressed coal communities in southwest Virginia.

UCS calls for the General Assembly to turn Virginia’s voluntary energy efficiency and renewable energy goals into mandatory targets and to strengthen them by requiring further energy efficiency savings equivalent to 9 percent of statewide electricity sales in 2022 and continuing at this level through 2030, and renewable energy generation (including hydro) meeting 8 percent of sales in 2025 and growing to 16 percent of sales in 2030.

The **Climate Justice Alliance (CJA)** addresses implementation of the CPP in general, but its comments are directly relevant to Virginia. It identifies a number of goals for CPP implementation:

- strengthening organizing efforts of frontline, environmental justice communities for building grassroots power and promoting Just Transition strategies;
- assuring that environmental justice provisions are in federal and state implementation plans and multi-state processes;
- assuring that carbon emissions are reduced and regulated at the source of pollution to protect frontline communities;
- urging reduction of co-pollutant emissions as well as greenhouse gases;
- eliminating loopholes that incentivize other extractive, dirty energy options such as natural gas, biomass, waste incineration, nuclear, etc.;
- assuring that energy conservation, efficiency, solar, wind and energy storage, zero waste, public transportation, ecosystem restoration, and regenerative plant-based organic agriculture are prioritized as carbon reduction strategies; and
- assuring that the CPP maximizes creation of quality, good-paying jobs and that communities of color and poverty have access to the jobs created through CPP

implementation—this includes worker transition and economic development for regions where the coal industry has been a significant economic driver.

CJA is critical of several aspects of the CPP: “It runs the risk of incentivizing a massive shift, already underway, from coal to natural gas in America’s power sector rather than contributing to a clean energy transformation. It opens the door for a range of harmful energy sources, from nuclear to waste incineration. It dramatically under-invests in energy efficiency and conservation. And it relies heavily on problematic cap-and-trade programs as a primary system of compliance and enforcement.”

CJA criticizes emission trading schemes because they allow big polluters to use ERCs or allowances to maintain higher-polluting power plants in low-income communities and communities of color. Moreover, CJA says, “These schemes are vulnerable to corruption, fraud, and leakage. They can incentivize false and deeply problematic approaches to emission reduction, by awarding credits for types of energy generation and pollution offsets that are far from clean. [And] they are a way of transferring wealth from rate-payers in heavily polluted places to investors who create new clean energy jobs and better health conditions elsewhere.”

No climate plan should aim to replace one fossil fuel with another, CJA argues, noting that natural gas is worse than coal for the climate, when methane gas leakage is accounted for, and that burning biomass is also worse for the climate than burning coal. CJA calls for EPA to close loopholes in the CPP that incentivize the conversion from coal to natural gas and biomass. By contrast, CJA urges that energy efficiency programs be expanded, as an effective and low-cost strategy to reduce power plant emissions and create important community and economic benefits, including hundreds of thousands of jobs. CJA welcomes EPA’s inclusion of the CEIP in the final rule, but expresses concern that EPA has linked this incentive to participation in a carbon trading market.

CJA urges EPA to conduct an analysis of existing federal and state laws that create barriers for community-based ownership and generation of renewable energy, including state laws that prevent community solar projects and state laws that prevent or place limits on net-metering.

Concluding Observations

The CPP is clearly insufficient to end U.S. reliance on fossil fuels for power generation; but in the absence of positive Congressional action, it’s likely to be the only viable alternative for moving in that direction over the next several years. Its targets are less ambitious than they should be, enabling the continued burning of natural gas (much of it produced by fracking). But it does provide incentives for energy efficiency programs and renewable energy, which state implementation plans should seek to maximize. CJA’s criticisms notwithstanding, emission trading—whether in-state or interstate—is a key component of the CPP, but state plans should maximize the benefits for consumers and affected communities.

In light of these principles, Virginia's implementation plan should include at least the following features:

- a mass-based approach that covers both existing and new power plants;
- the auctioning of allowances, with revenues to be used for the priorities identified by UCS; and
- participation in EPA's CEIP to promote early implementation of energy efficiency and renewable energy.

Participation in an interstate emission trading scheme should be encouraged only if it is shown to be more beneficial for the climate and low-income consumers. Measures to make Virginia's energy efficiency and renewable energy goals mandatory and to promote community solar projects and net-metering will probably have to await a more favorable political environment in the General Assembly.

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3/8/2016

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