Energy Efficiency and the Clean Power Plan: Options and Opportunities

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ABSTRACT

The EPA's Clean Power Plan—released in August 2015—recognizes energy efficiency as an important tool for avoiding CO_2 emissions. There are a number of ways that energy efficiency can contribute to compliance or play a role in state plans. Although the Clean Power Plan is being challenged in court, it raises key questions about the role of energy efficiency in achieving climate goals for states, utilities, and rate-payers. This paper describes how energy efficiency can play a role in Clean Power Plan compliance if and when the rule is implemented, considers potential advantages and disadvantages of different policy pathways if encouraging energy efficiency is a state goal, and discusses lessons for energy efficiency's role in achieving climate policy goals beyond the Clean Power Plan.

Introduction

In August 2015, the U.S. Environmental Protection Agency (EPA) released its Clean Power Plan, a landmark regulation that establishes the first CO_2 emissions guidelines for existing fossil fuel-fired power plants under the Clean Air Act (Clean Power Plan 2015). Consistent with the Clean Air Act, the Clean Power Plan grants states considerable flexibility to implement the guidelines. At the time of its release, the rule gave states up to three years, until September 2018, to develop a plan to implement the guidelines subject to EPA approval (2015). In February 2016, approximately seven months after release of the rule, the Supreme Court granted a request by twenty-nine states to suspend implementation while the litigation proceeds, inserting significant uncertainty into the timeline if the rule is ultimately upheld (Adler 2016).

The Clean Power Plan recognizes energy efficiency as an important tool for avoiding CO_2 emissions. There are a number of ways that energy efficiency can contribute to compliance or play a role in state plans regardless of when the rule goes into effect. Some states have announced they will continue planning to comply with the Clean Power Plan while the litigation moves forward, recognizing that if the rule is ultimately upheld states may not have another three years to restart their planning process (Holden, Harball, and Krucko 2016). Other states have paused plan development (2016). Whether the courts uphold the Clean Power Plan in full or in part or send the EPA back to the drawing board—all possible outcomes of the litigation—the rule raises key questions about the role of energy efficiency in achieving climate goals for states, utilities, and ratepayers.

This paper describes how energy efficiency can play a role in Clean Power Plan compliance—and climate policy generally—and considers potential advantages and disadvantages of different policy pathways if encouraging energy efficiency is a state goal. It

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begins with a brief overview of the Clean Power Plan and the role of energy efficiency in the different pathways available to states. Then, it examines three key issues raised by the Clean Power Plan regarding the role of energy efficiency in achieving CO_2 reductions: 1) The choice of rate-based or mass-based emissions standards under the Clean Power Plan; 2) The choice to include energy efficiency directly in a state plan or through complementary policies, and 3) Lessons for energy efficiency's role in climate policy beyond the Clean Power Plan.

Overview of the Clean Power Plan and the Role of Energy Efficiency

The Clean Power Plan sets national emission guidelines for most existing fossil fuel-fired power plants and directs each state to develop a plan to implement them (Clean Power Plan 2015). The emission guidelines reflect the EPA's legal determination of the "best system of emission reduction" under the Clean Air Act—which comprises a combination of heat rate improvements, re-dispatch of existing natural gas, and incremental renewable energy. In practice, compliance can be achieved through any measure that reduces emissions from affected sources, including energy efficiency. For any state that does not submit a final plan that meets the EPA requirements, the Clean Air Act directs the EPA to implement a federal plan on behalf of the state. To facilitate state plan development, the EPA expresses the emission guidelines in multiple forms that states can adopt, including "rate-based" (pounds of CO_2 per megawatt hour) and "mass-based" (total tons of CO_2) approaches. Furthermore, the EPA has proposed rate-based and mass-based model trading rules that states can adopt in full or in part once finalized (CPP Model Rules 2015).

Table 1. Clean Power Plan Implementation Timeline (As Finalized in August 2015)[2]

August 2015	Final rule released
September 2016	Deadline to request extension for state plan development. Deadline to indicate a state may participate in the Clean Energy Incentive Program (CEIP).
September 2018	Deadline to submit a full plan. In states with CEIP, qualifying projects must commence construction/operation after plan is submitted.
2020-21	CEIP early action program. In participating states, qualifying energy efficiency and renewable energy projects can earn credits/allowances for savings or generation in these years.
2022-24	First interim compliance period.
2025-27	Second interim compliance period.
2028-29	Third interim compliance period.
2030-31, 2031-32,…	Final compliance periods.

[2] The stay prevents the EPA from enforcing any deadlines that pass while the litigation proceeds. At a minimum, it is unlikely that states will need to request an extension or indicate the state may participate in the CEIP program in September 2016. However, it is not clear how the Supreme Court stay will affect other aspects of the timeline. If the rule is ultimately upheld, the EPA may not give states an additional three years to develop plans and implementation could proceed on the same or a similar timeline.

Energy efficiency can contribute to compliance under any plan approach regardless of whether a state plan includes a direct role for it; to the extent that energy efficiency avoids generation from affected power plants, those plants will emit less CO_2 and face a smaller compliance burden. However, if states wish to encourage energy efficiency investments through their state plans, the available tools differ across plan pathways. The remainder of this section describes the role of energy efficiency in different plan approaches and in the optional Clean Energy Incentive Program (CEIP).

Energy Efficiency in Rate-Based Trading Plans

In general, a rate-based standard limits the amount of pollution per unit of production; under the Clean Power Plan, a rate-based standard is an upper limit on the pounds of CO_2 emitted per megawatt hour of generation at an affected electric generating unit (EGU). However, the Clean Power Plan allows a unit's rate to be *adjusted* to account for certain activities that reduce emissions from electricity generation but are not reflected in an EGU's emissions rate, such as investments in energy efficiency or renewable energy. These activities can be granted credits—termed "emission rate credits" or ERCs—that represent one megawatt hour of generation added to the denominator of an EGU's rate in a compliance period. ERCs can be traded among entities that earn them ("ERC qualifying entities"), entities that need them for compliance, and other market participants.[3] States may also allow interstate trading of ERCs with market participants in other states using a similar rate-based plan.

$$\text{Unit Rate} = \frac{\text{Pounds of } CO_2}{\text{MWh + ERCs}}$$

The Clean Power Plan outlines the basic requirements for rate-based state plans to define resources eligible for ERCs, establish evaluation, measurement and verification (EM&V) requirements, and create a process to receive and review project applications (Clean Power Plan 2015, to be codified at 40 CFR 60.5830). The EPA has also released draft guidance on EM&V for state regulators (Draft EMV Guidance 2015). At a minimum, to earn ERCs, an energy efficiency project or program must be incremental (defined as having commenced operation after the baseline year of 2012) and demonstrate verified savings in a compliance year (Clean Power Plan 2015, 64950 to be codified at 40 CFR 60.5795).[4] Such projects or programs can be administered by utilities or third parties.

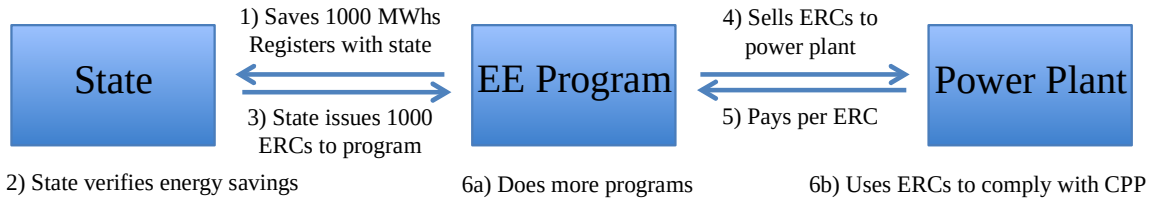

Figure 1. How ERCs incentivize energy efficiency programs under a rate based trading plan.

[3] The Clean Power Plan provides that any entity registered with the state can buy and sell ERCs. States can limit market participation in their state plan.
[4] For more details regarding energy efficiency EM&V, see the callout box on page 8.

Energy Efficiency in Mass-Based Trading Plans

Mass-based standards measure compliance based on aggregate emissions over a period of time, irrespective of production. In a mass-based trading program, the state would mint a number of "allowances"—permits to emit one ton of CO_2—equal to the state's emissions budget in each year.[5] The state would determine a method of initially distributing allowances into the market (e.g. by auctioning them or allocating them for free) and allowances can be traded among entities that need them for compliance and other market participants.[6] At the end of each compliance period, each affected power plant will total its emissions and surrender an equal number of allowances or face a penalty for any shortfall. The fixed number of allowances will maintain total emissions within the budget, and the market price of an allowance will provide an incentive to reduce emissions whenever abatement is less expensive than the cost of acquiring (or the opportunity cost of not selling) an allowance.

A mass-based trading approach can benefit energy efficiency in two ways. First, mass-based trading increases the cost of producing electricity from fossil fuels because fossil fuel generators must hold an allowance for every ton of emissions. This increase in the cost of fossil fuel generation improves the cost-competitiveness of energy efficiency and other non-emitting resources. Second, the distribution of allowances in a mass-based trading plan offers a tool for directly incentivizing or funding investments in desirable activities, such as energy efficiency.

Allowance distribution is a powerful tool for encouraging specific outcomes because allowances have financial value.[7] States have flexibility in determining how allowances are initially distributed into the market (Clean Power Plan 2015 to be codified at 40 CFR 60.58150).[8] If encouraging energy efficiency is a goal, states can consider allocating allowances for energy savings—which will look similar to the crediting process for ERCs—or auctioning allowances and investing the revenue in energy efficiency. Both of these strategies have precedent in other mass-based trading programs, such as the Acid Rain Trading Program, NOx Budget Program, and Regional Greenhouse Gas Initiative (Litz and Murray 2016).

Figure 2. How auction proceeds can be invested in energy efficiency programs under a mass based trading plan where the state auctions allowances.[9]

[5] Each state's mass-based emissions budget is defined by the EPA in the Clean Power Plan rule, taking into account each state's generation mix in the EPA's baseline. These state-by-state mass-based emissions budgets are intended to achieve the same level of emissions reduction as applying the rate-based standards.

[6] States have broad discretion in how to allocate allowances. The Clean Power Plan provides that set-aside allowances can be allocated to any ERC qualifying entity (i.e. providers of qualifying energy efficiency, renewable energy, or nuclear) and that any entity registered with the state can buy and sell allowances. If desired, states could limit market participation in their state plan.

[7] For an overview of the economic value of allowances and the numerous options for allowance distribution, see Litz and Murray 2016.

[8] States may determine the method of allowance distribution, but any set-asides of allowances allocated to non-affected units must be limited to resources that are eligible for ERCs under a rate-based plan, including incremental energy efficiency, renewables, and nuclear generation.

[9] Under a consignment auction, the state will assign responsibility for auctioning allowances and investing the proceeds to other entities, such as distribution utilities.

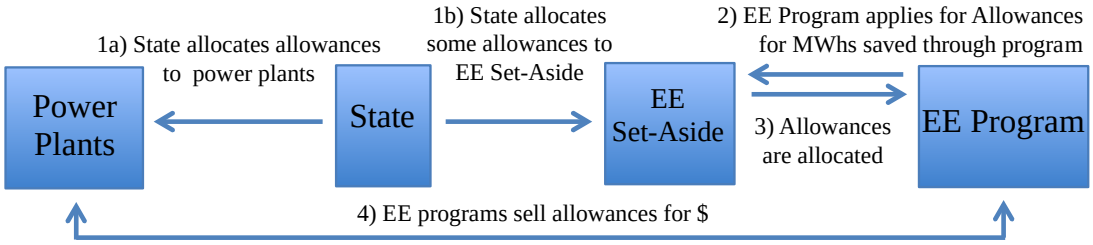

Figure 3. How allowance allocation incentivizes energy efficiency programs under a mass based trading plan where the state allocates allowances and provides a set aside for energy efficiency.

Energy Efficiency in Other Plan Types

Beyond the rate- and mass-based trading approaches detailed in the model rules, states have discretion to pursue other approaches to meeting the EPA's emission guidelines. For example, the Clean Power Plan provides for a "state measures" type plan that could encompass any number of state enforceable programs, so long as the state can demonstrate that it would achieve equivalent emissions reductions from affected sources (Clean Power Plan 2015, 64960 to be codified at 40 CFR 60.5880). One could imagine a state measures plan that expressly includes energy efficiency programs—such as an energy efficiency resource standard or building energy codes. However, any state that pursues a state measures type plan must also adopt a federally enforceable backstop plan, such as one of the two model rules. In practice, any state that does not already have existing programs that are likely to achieve the Clean Power Plan emission guidelines must therefore develop two plans to pursue a state measures approach, making this pathway unlikely for states that lack existing programs likely to achieve the Clean Power Plan emission guidelines (Clean Power Plan 2015, 64945 to be codified at 40 CFR 60.5745(a)(6)).

The Clean Energy Incentive Program

To encourage early investment in energy efficiency and renewable energy measures, the EPA plans to provide a Clean Energy Incentive Program (CEIP) that rewards investment in energy efficiency in low-income communities and carbon-free renewable energy sources like wind and solar (Clean Power Plan 2015, 64943 to be codified at 40 CFR 60.5737). The CEIP is an optional program that can be used in both mass- and rate-based state plans.[10] The voluntary program matches state allowances or ERCs with additional "early action" incentive ERCs or allowances from the EPA. Eligible projects under the CEIP can receive credit as early as 2020, two years earlier than the original timeline for compliance. For states choosing to participate in the program, demand-side energy efficiency projects in low-income communities will receive two allowances for every one MWh of avoided generation (one from the EPA and one from the

[10] For rate- based plans, the EPA has not yet determined the conversion factor for ERC issuance under the CEIP. For mass-based plans to qualify for matching allowances under the CEIP, energy savings must be evaluated according to the EPA's EM&V requirements, which may be a barrier to participation for states that do not already meet the requirements or would not alter their standards anyway for the purposes of implementing a mass-based set-aside as discussed below.

participating state) until the actual compliance period begins in 2022. This effectively doubles the value of the state allowances and provides an added incentive for near-term investments in energy efficiency.

Under the CEIP, the EPA plans to distribute matching allowances and ERCs equivalent to 300 million tons of CO_2 to states based on their pro-rata share of required emissions reductions. To participate in the program, each state must submit to the EPA a non-binding declaration of intent along with its initial state plan.[11] Energy efficiency programs can qualify to receive early action credits during the CEIP program if they begin operation after the state's final plan is submitted and approved. Although the EPA is encouraging participation in the CEIP, it has not yet defined the specific criteria, terms, and requirements for the program. In particular, the EPA requested feedback on certain aspects of the program—such as ways to define "low-income" for the purposes of the program and whether and how to apportion matching credits between qualifying energy efficiency and renewable energy projects—in the fall of 2015 (EPA 2016). Subsequently, the agency indicated it would formally propose the CEIP program in a separate action, which is expected to outline the eligibility criteria for low-income energy efficiency projects, including demographic, geographic, and sector-specific criteria (2016).[12] It is unclear how the stay will affect the CEIP timeline.

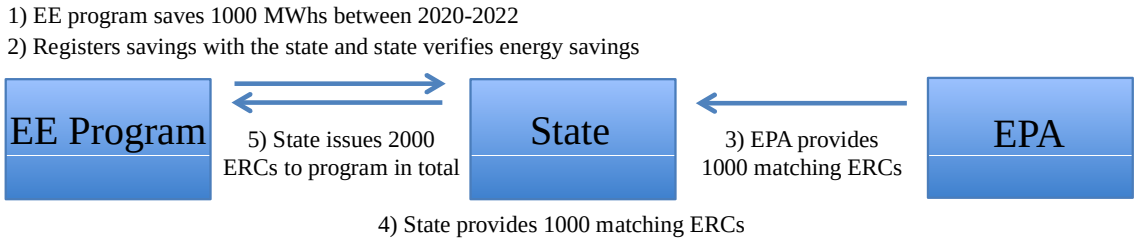

Figure 4. Example of how EE programs receive matching ERCs under the CEIP. Note that the allocation of matching allowances under a mass-based plan would be analogous to this process.

Energy Efficiency in the Clean Power Plan and Beyond: Key Issues

The Clean Power Plan raises key questions regarding the role of energy efficiency in climate policy, many of which remain important regardless of outcomes of CPP litigation. First, the Clean Power Plan offers a choice between two fundamental models for climate policy in the electricity sector—rate-based or mass-based emissions standards—which entail different roles and implications for energy efficiency. Second, the Clean Power Plan illustrates that energy efficiency may contribute to compliance with CO_2 regulations in the power sector directly or indirectly, highlighting the potential role of complementary policies. Regardless of which compliance path states choose, the Clean Power Plan provides a model for states and stakeholders that wish to advance energy efficiency outside of federal CO_2 regulations.

[11] States will not have to submit an initial plan while the stay remains in place. If the rule is upheld, it is unclear how much additional time states will have to develop a plan or indicate their intention to participate in the CEIP.
[12] The EPA sent a proposal to implement the CEIP to the Office of Management and Budget on April 27, 2016. (Harball 2016).

The Choice of Rate-based or Mass-based Standards

The Clean Power Plan gives states the option of implementing either rate-based or mass-based CO_2 emissions standards. While many factors are likely to play a role in this choice,[13] rate- and mass-based plans create different incentive structures for investment in energy efficiency and other clean energy resources.

Perhaps most intuitively, a rate-based plan that includes energy efficiency as an ERC-eligible resource provides a direct incentive for investment in energy efficiency projects. In this case, a project developer could apply to the state to be granted ERCs for any qualified savings and monetize the ERCs by selling them to entities that need them for compliance. Under this approach, there is a direct signal to incentivize energy efficiency investments, but the strength of the incentive depends on the market price of an ERC and the cost of EM&V for energy efficiency programs.

In contrast, a mass-based approach indirectly incentivizes energy efficiency by increasing the cost of electricity from affected generation. Here, the magnitude of the incentive for energy efficiency depends on the cost-differential between meeting electricity demand with supply-side generation and demand-side efficiency. Furthermore, even though a mass-based plan does not necessarily provide a direct incentive for energy efficiency—analogous to the ERC in a rate-based plan—states have multiple options for creating direct incentives or making direct investments through the distribution of allowances. In fact, states could mirror the incentive structure of a rate-based approach through allowance allocation to ERC-qualifying entities.

States have broad discretion to distribute allowances in a mass-based plan, so long as the state plan addresses the risk of "leakage" to new sources (i.e. the risk that regulating only existing sources leads to increased emissions from new power plants not covered by the CPP).[14] States' options for encouraging energy efficiency through allowance distribution include: 1) directly allocating to energy efficiency providers, 2) auctioning allowances and investing the proceeds in energy efficiency, and 3) providing a utility or other qualifying entity with the allowances to auction on their behalf (consignment auction).[15]

Direct allocation to energy efficiency providers would mimic the crediting system in a rate-based plan. Project developers would apply to the state to be granted allowances for qualified electricity savings and could monetize the allowances by selling them into the market. Similar to the rate-based approach, the magnitude of the incentive would depend on the market value of the allowance, which must be sold for the project developer to monetize its value.

Alternatively, auctioning allowances would provide a state with a revenue stream that could be invested directly in energy efficiency or other state goals. For example, the nine northeast states participating in the Regional Greenhouse Gas Initiative (RGGI) cap and trade program auction the majority of their allowances. Through 2013, the RGGI states invested 57% of the revenue in energy efficiency (RGGI 2015). However, for many states, auctions may be

[13] For example, states may consider whether their existing and planned fleet appears well suited to comply with a certain approach, stakeholder preferences, administrative simplicity, and other state policy goals.

[14] "Leakage" refers to the potential for emissions to shift from regulated sources to unregulated sources. The Clean Power Plan requires states to address the risk of leakage from existing sources to new sources if pursuing a mass-based program that applies only to existing sources. One option for doing so is through allowance allocation. For more information on the requirement to address leakage, see DeMeester & Adair 2015. Notably, some commenters have also suggested that EPA require states to incorporate programmatic energy efficiency to mitigate leakage, see Burtraw et *al*. 2016.

[15] See figures 2, 3, and 4 for reference.

politically unpalatable and could require new legislation (Peskoe 2016). A similar approach that may not require new legislation is a consignment auction (2016). In a consignment auction, the state could allocate allowances for free to distribution utilities that sell electricity to retail customers—so-called load serving entities (LSEs). The state could then require the LSEs to consign those allowances to an auction and invest the proceeds in energy efficiency or other consumer benefit programs. This approach has been used in California's cap and trade program, where proceeds have been returned to ratepayers through rebates (CARB 2015).[16]

Finally, when considering the likely incentives for energy efficiency under a rate- or mass-based approach, it is important to keep in mind that the value of an ERC or allowance will depend on supply and demand, which in turn are likely to depend on interstate trading. States considering rate-based approaches may appear well positioned to comply, resulting in relatively low ERC prices (Holden 2015). If ERC prices are close to zero, there may be little practical value in the direct crediting of ERCs to energy efficiency project developers under a rate-based plan. Furthermore, because trading may only occur between states that implement similar plan approaches, opportunities to trade between states may be limited to the extent that only a few states choose a certain approach (e.g. if there are a limited number of states with rate-based plans).

	Pros	Cons
Rate-based	• Clear value established for each MWh of savings via ERCs • Can sell across state lines if states plan accordingly and demand exists • Can leverage CEIP	• EM&V requirements for tracking and registering projects and ERCs • EM&V requirement for tracking and registering actual energy savings • Value of ERC is subject to the market
Mass-based, Allocated w/ set aside	• Can provide allowances to EE programs, which can then be sold for $ • Can sell across state lines if states plan accordingly and demand exists • Can leverage CEIP	• EM&V requirements for tracking and registering projects and allowances • Value of an allowance is subject to the market
Mass-based, Auctioned and/or Consigned	• Can provide direct funding stream for EE programs (both) • Minimal EM&V requirements for EE programs (both)	• In many states, new legislation would be needed to grant state environmental agencies authority to auction (auctioned) • Ongoing allocation of funding to EE programs is potentially subject to annual state budget decisions depending on initial design of the policy (both)

Table 2. Pros and cons of rate- and mass-based incentive structures for energy efficiency.

[16] The California PUC has authority to allocate up to 15% of auction revenue to energy efficiency programs.

The Importance of Evaluation, Measurement and Verification

Under a rate-based compliance plan, the EPA requires that states put in place an approved EM&V plan that describes how energy savings from energy efficiency projects will be quantified and verified. States must create an ERC issuance system ("issuance system") that 1) accepts and reviews applications for energy saving programs/projects, 2) registers programs/projects as they are accepted by the state, 3) requires and reviews M&V reports submitted by each program/project, 4) issues ERCs as they are generated, 5) tracks the sale, transfer, and retirement of ERCs ("tracking system"), 6) has the ability to correct errors in the number of ERCs issued if they occur, 7) is able to suspend or revoke the qualification of a program/project if it at any point does not meet requirements for receiving ERCs, 8) defines the qualifications of an independent verifier, and 9) is able to register independent verifiers and revoke their qualification if needed (Clean Power Plan 2015, 64951 to be codified at 40 CFR 60.5805).

Once a state submits an approved EM&V plan, then energy efficiency programs and projects submit applications for ERCs to the state's established tracking system. Each energy efficiency program that applies for ERCs must submit a plan that 1) identifies a baseline scenario absent the submitted program, 2) measures energy saved by the program, 3) adjusts this measurement to account for independent factors such as weather, and 4) establishes the length of time the program will continue to produce savings. This plan must be reviewed and approved by a state-certified third party (Clean Power Plan 2015, 64951 to be codified at 40 CFR 60.5805(i)). In addition, EM&V reports and ERC calculations from the program must also be reviewed by a third party.

Under a mass-based compliance plan that implements set-asides for energy efficiency programs, the EPA requires states to follow the same steps as for a rate-based plan for establishing an issuance system. In this instance, the state would also need to determine how many allowances to allocate per MWh saved (e.g. one allowance per MWh or pro-rata to all qualifying MWhs). However, a key distinction is that at the program level, allowances allocated to energy efficiency would not be subject to the same rigor as ERCs. An ERC must represent one MWh of actual energy generated or saved with zero associated CO_2 emissions (Clean Power Plan 2015, 64949 to be codified at 40 CFR 60.5790(c)(2)(ii)). Issuing an allowance for a MWh reduction that did not occur would not affect the environmental integrity of the mass-based program because the total number of allowances is fixed (equal to the total mass budget). In contrast, issuing an ERC for a MWh reduction that did not occur *would* affect environmental outcomes. Thus, EM&V procedures are likely to face greater scrutiny in a rate-based approach. This distinction is also reflected in the EPA's draft EM&V guidance, which only applies to rate-based plans (EPA 2015).

Under a mass-based compliance plan that auctions allowances and distributes auction revenue to energy efficiency programs, EM&V requirements would not need to be included in a state plan or become federally enforceable. This approach has precedent (e.g. RGGI) and may be administratively simpler for states that do not already have established energy efficiency credit issuance systems that could be converted to ERC or allowance issuance systems (e.g. NC-RETS). However, this approach does not create the same type of production incentive for qualifying energy efficiency that is inherent in a rate-based system or mass-based set-aside because the allowances are not tied to or justified by MWh saved.

The Role of Complementary Policies for Energy Efficiency

If encouraging energy efficiency as a compliance tool is a goal, states and stakeholders may also want to consider the role of complementary programs and policies—such as energy efficiency resource standards; ratepayer-funded energy efficiency programs provided by utilities or by third parties on behalf of utilities or states; state building energy codes; privately provided energy services, such as energy savings performance contractors; low-income state efficiency and weatherization programs; and state appliance standards. Complementary policies can ensure energy efficiency investments contribute to compliance by avoiding generation and thereby reducing emissions at the source. These policies can help ensure investments are made in cost-effective emissions reduction measures that face barriers to implementation.[17]

For example, California relies extensively on complementary policies to achieve its greenhouse gas emissions targets under its Global Warming Solutions Act of 2006 (CARB 2008). California's rationale for coupling complementary policies[18] with the price signal from its mass-based emissions trading program stems from the persistence of traditional barriers such as "lack of information available to energy consumers, different incentives for landlords and tenants to conserve energy, and different costs of investment financing between individuals, private corporations, and the state government" (CARB 2008, 18).

Under the Clean Power Plan, complementary policies can work in tandem with incentives built into a plan as described above or supplement a plan that does not include a direct role for energy efficiency. For example, qualifying energy efficiency measures induced by complementary policies could also generate ERCs under a rate-based plan or earn allowances in a mass-based program. Under both approaches, including a direct incentive for energy efficiency in a state plan alongside complementary policies would provide an additional incentive for investments in those programs. However, states and stakeholders may want to weigh the benefits of any additional incentive against additional administrative costs associated with EPA oversight of EM&V and federal enforceability of a state plan. With the exception of "state measures" plans, state plans to implement the Clean Power Plan become federally enforceable once approved, and any energy efficiency provisions are subject to EPA approval (Clean Power Plan 2015, 64961 to be codified at 40 CFR 60.5880).

Finally, complementary policies can advance state policy goals beyond the Clean Power Plan. The Clean Power Plan has focused attention on energy efficiency's role in reducing CO_2 emissions, and the rule presents states and stakeholders with the opportunity to define that role state by state. Although the Supreme Court's decision to pause implementation of the Clean Power Plan has heightened uncertainty about implementation of the rule in its current form, the Clean Power Plan provides a useful framework for states and stakeholders that wish to move forward with energy efficiency as an emissions reduction strategy.

[17] Some policies may increase overall costs if they favor emissions reduction activities that are more expensive than the market would have otherwise delivered, but these policies may also help states achieve separate goals such as helping low-income consumers decrease their energy bills, reducing co-pollutants, or delaying or avoiding investments in power plants or transmission infrastructure (Carlson 2011).

[18] California's complementary policies include, but are not limited to, a low carbon fuel standard, a renewable energy standard, and ratepayer funded energy efficiency programs (CARB 2008).

Lessons for Energy Efficiency's Role in Climate Policy Beyond the Clean Power Plan

The EPA's Clean Power Plan recognizes energy efficiency as an important tool for reducing CO_2 emissions in the electricity sector. Regardless of the outcome of the current litigation, the Clean Power Plan offers a useful framework for states and stakeholders that choose to move forward to advance their own goals related to energy efficiency's role in achieving CO_2 reductions. The fundamental questions states and stakeholders have already invested time and effort to address in the context of the Clean Power Plan apply generally to any regulatory or voluntary effort to mobilize energy efficiency to avoid emissions. For example, states or stakeholders that choose to move forward must evaluate the form of the standard (e.g. rate, mass, or a suite of complementary policies) and the form of EM&V that is most appropriate for their purposes. They may also want to consider the role of energy efficiency in mitigating price impacts on low-income ratepayers and ensuring equitable distribution of benefits—concerns the Clean Power Plan attempts to address through the CEIP and a separate requirement for states to engage vulnerable communities, such as low-income communities and communities near polluting power plants, during plan development.

Energy efficiency is recognized as a low cost, low risk, and low emissions energy resource (NWPCC 2016, Binz 2012, Hoppock and Patino Echeverri 2013), but continues to face barriers to implementation (Brown 2015). Markets for energy efficiency credits (also known as "energy savings credits" or "white tags")—which would operate similar to ERCs under the Clean Power Plan and existing renewable energy markets in many states—have been slow to develop, reflecting the challenge of accurately and consistently measuring energy savings and avoided emissions across projects (WRI 2008, Brown 2015).

The Clean Power Plan's framework for rate-based trading builds on existing markets for energy efficiency and more prevalent renewable energy credits, taking important steps toward establishing a more robust tradable instrument for energy efficiency. For example, the EPA's requirements for ERC issuance systems and draft EM&V guidance attempt to ensure that practices are reasonably consistent across programs and geographies. The U.S. Department of Energy has provided funds for six states, the National Association of State Energy Officials, and The Climate Registry to develop a National Energy Efficiency Registry (NEER) intended to support transparency in this process (TCR 2016). States and stakeholders interested in further developing markets for energy efficiency credits (EECs) could build upon these efforts through state, local, or voluntary programs. In addition, there is potential for demand growth for tradable energy efficiency instruments in the near future as more entities (e.g. corporations and universities) sign onto voluntary corporate sustainability and climate commitments and purchase EECs, RECs, and carbon offsets to meet these goals. If the Clean Power Plan is ultimately upheld, progress on these fronts could better position states to take advantage of energy efficiency crediting in a rate-based approach, allowance set-asides, or complementary policies.

Conclusion

The EPA's Clean Power Plan creates opportunities to deploy energy efficiency as a tool for reducing CO_2 emissions. It also poses key choices about policy design that can be applied to the broader challenges of reducing CO_2 emissions and overcoming barriers to energy efficiency. Regardless of the outcome of the current litigation, the Clean Power Plan provides state policy makers, environmental groups, and other energy efficiency stakeholders a flexible framework that can be used to design energy efficiency programs that meet the needs of their constituents.

The core design questions that the states face under the Clean Power Plan include the choice of rate-based or mass-based standards, whether to assign a direct or indirect role for energy efficiency, and whether to encourage energy efficiency investments in low-income communities. While some states may determine that statewide energy efficiency programs are not necessary, others may use these questions and guidelines to create robust energy efficiency programs that advance state goals to reduce CO_2 emissions, improve air quality, delay the need for new fossil fuel plants, and help stabilize the cost of electricity to ratepayers as grids transition to accommodate new technologies (e.g. renewables, smart meters, etc.).

While the timeline and other details of implementation are uncertain, states and stakeholders can continue to move forward by addressing the questions outlined in this paper; implementing state, local, or voluntary programs; and building capacity to deploy energy efficiency as a CO_2 reduction tool. While it is unclear whether energy efficiency measures deployed today will become eligible for any future credits or allowance set-asides through the Clean Power Plan, these measures can help avoid or delay construction of new fossil fuel-fired power plants. This, in-turn, can reduce future emissions, mitigate exposure to climate policy risk, and help achieve CO_2 reduction goals beyond the Clean Power Plan.

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