



# A Policymaker's Guide to Incorporating Existing Homes into Carbon Reduction Strategies and Clean Power Plan Compliance

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By: Kara Saul Rinaldi and Elizabeth Bunnan  
Home Performance Coalition



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## **Authors:**

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## I. Introduction

Residential energy efficiency is a key part of the solution to address U.S. carbon emissions. America's aging and growing housing stock is a critical part of U.S. energy demand, with residential buildings accounting for 20 percent of U.S. carbon emissions.<sup>1</sup> Residential energy efficiency can play an important role as a proven, low-cost, and accessible way to help meet carbon emission reduction goals under the Clean Power Plan, as well as requirements under other state, local, or utility carbon emission reduction frameworks. Utilizing energy efficiency to meet carbon targets requires ample consideration and planning, as compliance options available for the residential sector are not always as straightforward as other energy efficiency or renewable energy approaches. This paper aims to provide policymakers with actionable recommendations on carbon emission reduction goals and compliance pathways of the U.S. Environmental Protection Agency (EPA)'s Clean Power Plan (CPP), as well as examples of where energy efficiency is applicable and the residential sector might have a role in meeting carbon emissions targets.

### A. Overview of Final Clean Power Plan

In August 2015, the EPA released the final Clean Power Plan (CPP).<sup>2</sup> Adopted pursuant to EPA's authority under section 111(d) of the Clean Air Act, the CPP establishes state-specific carbon dioxide (CO<sub>2</sub>) emission reduction goals<sup>3</sup> and is projected to reduce carbon emissions from the power sector 32 percent from 2005 levels by 2030.<sup>4</sup>

While EPA gave each state a distinct goal for cutting CO<sub>2</sub> emissions, each state will decide how to achieve that goal. States can switch from coal-burning power plants to existing natural gas, expand renewables or nuclear, employ a wide array of energy

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<sup>1</sup> Annual Energy Outlook 2016. U.S. Environmental Information Administration.

[https://www.eia.gov/forecasts/aeo/data/browser/#/?id=2-AEO2016&cases=ref2016~ref\\_no\\_cpp&sourcekey=0](https://www.eia.gov/forecasts/aeo/data/browser/#/?id=2-AEO2016&cases=ref2016~ref_no_cpp&sourcekey=0)

<sup>2</sup> *Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64668 (Oct. 23, 2015)*. It should be noted that the Supreme Court issued a stay of the CPP in February 2016. The stay puts enforcement of the CPP on hold until litigation concludes; however, EPA and many states continue CPP planning and preparation. For more information on the stay and its implications for states, see Section I.C.

<sup>3</sup> The final CPP establishes CO<sub>2</sub> emission rate goals and mass equivalents for 47 states. Individual state targets are based on national uniform "emission performance rate" standards (pounds of CO<sub>2</sub> per MWh) and each state's unique generation mix. Vermont and Washington, D.C. are exempt because they do not have any large fossil fuel or electric power plants. Alaska and Hawaii are also not currently covered under the rule because of their unique grid and energy infrastructure. EPA has said that it will eventually release emissions performance rates for Alaska and Hawaii. EPA has released state-specific factsheets that outline emissions goals and compliance considerations for each state. These state-specific factsheets are available at <https://www.epa.gov/cleanpowerplanttoolbox/clean-power-plan-state-specific-fact-sheets>.

<sup>4</sup> For more information on the CPP - including a rule summary, history, factsheets, and resources for states - visit: <https://www.epa.gov/cleanpowerplan/clean-power-plan-existing-power-plants>.

efficiency policies and measures, engage in carbon trading – individual states can decide.

Energy efficiency should play a very important role in state compliance with emissions targets as it will reduce the overall cost and achieve reductions sooner. EPA supports the use of energy efficiency as a proven, cost-effective, and widely available compliance option and, according to a recent ACEEE analysis, energy efficiency can get most states more than halfway to their emissions targets.<sup>5</sup> In addition to being a cost-effective option for CPP compliance, energy efficiency also helps states meet other air quality and clean energy goals, reduce consumers' energy bills, create local jobs, and increase energy reliability.

## ***B. Energy Efficiency in the Clean Power Plan***

EPA explicitly recognizes energy efficiency as a proven, cost-effective, and widely-available compliance option in the Clean Power Plan.<sup>6</sup> In fact, as explained in Section II.C of this paper, EPA even included an incentive program to stimulate early investment in energy efficiency in low-income communities.

The final CPP identifies a variety of energy efficiency measures, programs, and policies that can count toward compliance. Examples include:

- Energy efficiency measures that reduce electricity use in residential and commercial buildings, industrial facilities, and other grid-connected equipment;
- Energy efficiency measures installed through an energy efficiency deployment program (e.g., appliance replacement and recycling programs and behavioral programs) administered by electric utilities, state entities, and other private and non-profit entities;
- State or local requirements that result in electricity savings, such as building energy codes and state appliance and equipment standards; and

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<sup>5</sup> ACEEE. 2016. Energy Efficiency Lowers the Cost of Clean Power Plan Compliance. <http://aceee.org/sites/default/files/ee-lowers-cost-cpp-0316.pdf>

<sup>6</sup> In the proposed rule, EPA included energy efficiency as one of four “building blocks” for determining the “best system of emission reduction” (BSER), as required under section 111(d) of the Clean Air Act. In the final rule, however, EPA omitted energy efficiency as a “building block.” It is important to understand that this change does not have any actual impact on the role energy efficiency can play in state compliance with CPP goals. The building blocks are only relevant for EPA’s development of state emission reduction targets. They are irrelevant for compliance and are irrelevant to consideration of energy efficiency as a compliance mechanism. A state may use some, all, or none of the building blocks in any proportion to achieve compliance.

- Energy efficiency measures installed as the result of individual projects, such as those implemented by energy service companies (ESCOs).

In addition, energy efficiency is promoted as a key compliance mechanism for states in many of the supporting documents EPA released – including the Demand-Side Energy Efficiency Technical Support Document<sup>7</sup> and the Clean Power Plan Key Topics and Issues Factsheet<sup>8</sup> – and is also a component of the final rule’s Regulatory Impact Analysis.<sup>9</sup>

Specific reference to energy efficiency can be found in four major places in the CPP:

1. Emissions Guidelines<sup>10</sup> – explicitly states that energy efficiency projects may be eligible to receive CPP credits, describes how energy efficiency projects may receive those credits, and outlines the general requirements for measuring and verifying savings;
2. Proposed Federal Plan and Model Trading Rules<sup>11</sup> – outlines presumptively approvable EM&V approaches and presents a framework for the Clean Energy Incentive Program (CEIP), a voluntary early-action program associated with the CPP;
3. Draft EM&V Guidance for Demand-Side Energy Efficiency<sup>12</sup> – outlines applicable guidance and recommendations for how to measure energy efficiency savings; and

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<sup>7</sup> Demand-Side Energy Efficiency Support Document (August 2015) is available at <https://www.epa.gov/sites/production/files/2015-11/documents/tsd-cpp-demand-side-ee.pdf> (herein referred to as “Draft EM&V Guidance document”).

<sup>8</sup> Key Topics and Issues Fact Sheet (August 2015) is available at <https://www.epa.gov/sites/production/files/2015-11/documents/cpp-key-topics.pdf>.

<sup>9</sup> Regulatory Analysis for the Clean Power Plan Final Rule (August 2015) is available at <https://www.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule-ria.pdf>.

<sup>10</sup> See 40 C.F.R. § 60.5805 for requirements of ERC issuance and 40 C.F.R. § 60.5830 for an explanation of how savings are to be measured and verified.

<sup>11</sup> *Federal Plan Requirements for Greenhouse Gas Emissions From Electric Utility Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; Proposed Rule*, 80 Fed. Reg. 64,996 (October 23, 2015) [herein referred to as “Proposed Federal Plan”]. It should be noted that the rate-based Federal Plan, as currently proposed, does not explicitly include energy efficiency. HPC and many others have advocated for the inclusion of energy efficiency in any final rate-based Federal Plan, and the guidance in this report is structured accordingly.

<sup>12</sup> Evaluation Measurement and Verification (EM&V) Guidance for Demand-Side Energy Efficiency (EE). Draft for Public Input. August 3, 2015. [https://www.epa.gov/sites/production/files/2015-08/documents/cpp\\_emv\\_guidance\\_for\\_demand-side\\_ee\\_-\\_080315.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/cpp_emv_guidance_for_demand-side_ee_-_080315.pdf).

4. Clean Energy Incentive Program (CEIP) Proposed Rule<sup>13</sup> – builds upon the framework laid out in the Proposed Federal Plan and presents additional details on how states can use energy efficiency to get early-action credits through this voluntary program.

Although the Emissions Guidelines are final, EPA is currently working to finalize the Proposed Federal Plan and Model Trading Rules, EM&V Guidance, and CEIP Proposed Rule. The public comment period for both the Proposed Federal Plan and Model Trading Rules and the Draft EM&V Guidance ended January 21, 2016. The Federal Plan would establish emission reduction obligations for affected power plants in any state that does not submit an approvable compliance plan. It includes recommended energy efficiency EM&V practices that would be employed under the Federal Plan.

The EM&V practices laid out in the Proposed Federal Plan are considered “presumptively approvable” for states to include in their own compliance plans.<sup>14</sup> Thus, states looking for direction should understand that if they include the EM&V methods the Proposed Federal Plan laid out in their state compliance plan, they would be approved by EPA. Any alternative EM&V approaches included in a state’s compliance plan must be “functionally equivalent” to the presumptively approvable provisions in the Federal Plan.<sup>15</sup> It should be noted that EPA has stated it is open to new approaches to EM&V. In the residential sector, technology and policy are evolving very quickly, and thus the opportunity for advanced EM&V (such as smart grid technologies) may be an alternative for states to consider.

EPA has also published a Draft EM&V Guidance document for demand-side energy efficiency. This guidance is not a formal rule, but it provides supplemental information to help states and energy efficiency providers adhere to the EM&V requirements in the Emission Guidelines and the recommendations in the Proposed Federal Plan. Contents include baseline definitions, applicable EM&V methods, options for using industry-standard protocols and guidelines, and other topics necessary for successfully quantifying and verifying savings. Again, new technologies that would supplement and

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<sup>13</sup> Clean Energy Incentive Program (CEIP) Design and Implementation, Docket ID No. EPA-HQ-OAR-2015-0734, 81 FR 42939. <http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OAR-2015-0734>. Additional information and resources on the CEIP are available at <https://www.epa.gov/cleanpowerplan/clean-energy-incentive-program>.

<sup>14</sup> The Proposed Federal Plan also includes “presumptively approvable” Model Trading Rules for complying with both a rate-based limit and a mass-based limit that states could adopt to meet their obligations under the CPP. EPA is expected to finalize one of these options - the rate-based Model Trading Rule or the mass-based Model Trading Rule – as the approach it will use when imposing the Federal Plan for any states that fail to submit an approvable state plan.

<sup>15</sup> 80 Fed. Reg. 64,996, pages 185-186

enhance EM&V methods can be included in the final EM&V Guidance. It is important to note that EPA's approach to EM&V – including the regulatory provisions included in the Proposed Federal Plan and Draft EM&V Guidance – encourages the use of existing protocols and methods and leverages best practices already in use.

#### Clean Energy Incentive Program<sup>16</sup>

EPA also proposed an optional Clean Energy Incentive Program (CEIP) to provide states with additional incentives for early action emissions reductions that reduce end-use energy demand during 2020 and/or 2021.<sup>17</sup> The CEIP is essentially a “matching fund” program to incentivize states to invest early in renewable energy and low-income community energy efficiency and solar.<sup>18</sup> Energy efficiency projects in low-income communities are eligible for “double” matching credits under the CEIP. For example, for each 2 MWh of avoided generation achieved through eligible demand-side energy efficiency projects in low-income communities, the state will award 2 early action credits (either allowances or ERCs, depending on whether the state is taking a mass-based or rate-based approach), and EPA will award an additional 2 matching credits, for a total of 4 credits for every 2 MWh of savings.<sup>19</sup>

EPA has not yet announced the deadline by which states must indicate their intention to participate in the CEIP. Originally, states were required to indicate their intention to participate by September 6, 2016; however, in light of the Supreme Court stay, EPA removed that deadline. In the CEIP Proposed Rule, EPA says it will provide further direction on timing requirements once litigation surrounding the CPP has been resolved.

EPA solicited public comment on the CEIP Proposed Rule (published in June 2016) through November 1, 2016, and is in the process of receiving and reviewing those

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<sup>16</sup> Clean Energy Incentive Program (CEIP) Design and Implementation, Docket ID No. EPA-HQ-OAR-2015-0734, 81 FR 42939. <http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OAR-2015-0734>. Additional information and resources on the CEIP are available at <https://www.epa.gov/cleanpowerplan/clean-energy-incentive-program>.

<sup>17</sup> EPA is proposing to implement the CEIP as part of the Federal Plan, which will be implemented in states that do not submit an approvable compliance plan. For states in which the Federal Plan is not implemented, the CEIP is voluntary.

<sup>18</sup> The EPA matching pool will be equivalent to 300 million short tons of CO<sub>2</sub> (300 million allowances or 375 million ERCs). For additional details on the matching pool and how EPA is proposing to divide it between low-income community projects (which include energy efficiency and solar projects) and renewable energy projects outside of low-income communities, see EPA's factsheet on the CEIP Proposed Rule, available at:

<https://www.epa.gov/sites/production/files/2016-06/documents/fs-ceip-proposal-061616.pdf>

<sup>19</sup> Proposed allocation amounts (in terms of both allowances and ERCs) for each state under the CEIP Proposed Rule are available at [https://www.epa.gov/sites/production/files/2016-06/documents/state-by-state\\_reserve\\_tables.pdf](https://www.epa.gov/sites/production/files/2016-06/documents/state-by-state_reserve_tables.pdf).

comments. See Section II.C for additional details on the CEIP Proposed Rule and eligibility requirements for energy efficiency projects.

### **C. Current Legal Status and Implications**

The Clean Power Plan is being challenged by twenty-eight states as well as several utility and industry groups.<sup>20</sup> The numerous petitions against the rule have been consolidated into a single case before the D.C. Circuit Court of Appeals.

On February 9, 2016, the Supreme Court overturned a previous D.C. Circuit Court of Appeals decision to deny the petitioners a stay of the rule until litigation concluded. The 5-4 decision from the Supreme Court essentially grants the stay the petitioners originally sought and pauses CPP enforcement until litigation concludes.<sup>21</sup>

While the Supreme Court stay halts enforcement of the CPP, it does not prevent continued planning for the rule.<sup>22</sup> EPA has stated numerous times that it will continue many aspects of its work on the CPP – including reviewing public comments on and developing final versions of the Proposed Federal Plan and Model Trading Rules, Draft EM&V Guidance, and CEIP – and will also continue to provide guidance to any states seeking this technical support. Assuming the CPP is upheld by the Supreme Court, the practical implication of the stay for planning purposes is the delayed deadline for submission of state compliance plans. In April 2016, EPA Administrator Gina McCarthy said that the EPA will delay the original September 2018 final deadline for states to submit compliance plans and will not enforce a September 2016 deadline for states to submit initial compliance plans.<sup>23</sup> As previously mentioned, EPA has also removed the deadline by which states must indicate their intention to participate in the CEIP. EPA has said it will provide further direction on this deadline once litigation surrounding the CPP has been resolved.

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<sup>20</sup> There are also many states that are supporting EPA in the case before the D.C. Circuit Court. For a comprehensive list of states, cities, industry groups, and other actors that have officially taken sides in the judicial review process, see E&E's Power Plan Hub "Battle Lines" page:

[http://www.eenews.net/interactive/clean\\_power\\_plan/fact\\_sheets/legal\\_battle\\_lines](http://www.eenews.net/interactive/clean_power_plan/fact_sheets/legal_battle_lines)

<sup>21</sup> On May 16, 2016, the D.C. Circuit Court rescheduled oral argument - originally scheduled for June 2nd before a three judge panel - to a September 27 en banc review before all the justices on the court. With the new hearing date, it is likely that a decision will come in early 2017. After the D.C. Circuit Court issues its ruling, the Supreme Court is expected to take up the case.

<sup>22</sup> If the court had wanted to completely stop EPA from helping states move ahead with their own implementation plans, it could have issued an injunction instead of a stay, blocking all activity rather than only the deadlines that occur during the stay.

<sup>23</sup> As of June 2016, EPA has not announced a revised deadline for state compliance plans.

State responses to the Supreme Court stay vary, but many state regulators have indicated that they will continue to plan for a future in which carbon is regulated, whether by the CPP or another regulation. State regulators and other stakeholders, such as utilities, are often tasked with making 20-, 30-, even 40-year plans or investments, and there is a general consensus that cutting carbon emissions will be an inevitable requirement over that time period; thus, many states are planning for the eventuality.

State regulators<sup>24</sup> also recognize the inherent interconnectedness of the CPP and other regulations pertaining to clean air and clean energy.<sup>25</sup> This is even true in states that have publicly stated that they will stop planning for the CPP in light of the Supreme Court stay.<sup>26</sup> Georgia, for example, is one of the states that has said it ceased planning entirely. But, while Georgia's Environmental Protection Division may have stopped all of its work on the rule, electric regulators in the state must still – as part of their normal course of business - review Georgia Power Co.'s integrated resource plan (IRP), which proposes increased use of renewables and energy efficiency – both of which will help the state comply with the CPP.<sup>27</sup> IRP and similar planning is happening not just in Georgia, but in many states across the country, and good IRP planning requires at least some level of carbon planning. The same is true for Public Utilities Commission (PUC) rate case planning, as well as ozone pollution and regional haze planning.

Wisconsin is another state that has said it will stop planning for the CPP in light of the Supreme Court stay. The state's governor issued an executive order prohibiting state officials from planning.<sup>28</sup> That said, the Wisconsin Public Service Commission is

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<sup>24</sup> In April 2016, fourteen states asked EPA for additional guidance on coordinating CPP compliance with other rules affecting power sector, establishing emissions trading programs, verifying energy efficiency, and the Clean Energy Incentive Program. These fourteen states (California, Colorado, Connecticut, Delaware, Maryland, Massachusetts, Minnesota, New Hampshire, New York, Oregon, Rhode Island, Vermont, Virginia and Washington) are supporting the EPA in its legal defense of the rule.

<sup>25</sup> Energy efficiency can help states comply with state clean air strategies and regulations, as well as federal clean air requirements, such as the National Ambient Air Quality Standards. According to the Regulatory Assistance Project, energy efficiency can reduce ammonia (NH<sub>3</sub>), carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), heavy metals (HM), methane (CH<sub>4</sub>), nitrogen oxides (NO<sub>x</sub>), nonmethane volatile organic compounds (NMVOC), primary particulate matter (PM), polycyclic aromatic hydrocarbons (PAH), and sulfur dioxide (SO<sub>2</sub>).

<sup>26</sup> For updated information on where each state stands in the planning process (e.g., continuing planning in light of the stay, assessing, or suspending until litigation concludes), see E&E's Power Plan Hub "Supreme Court Stay Response" at [http://www.eenews.net/interactive/clean\\_power\\_plan#planning\\_status\\_chart](http://www.eenews.net/interactive/clean_power_plan#planning_status_chart).

<sup>27</sup> [http://www.eenews.net/stories/1060036323?utm\\_content=buffer8930a&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](http://www.eenews.net/stories/1060036323?utm_content=buffer8930a&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)

<sup>28</sup> Executive Order #186, Relating to a Prohibition on Implementing EPA Regulations Pending Completion of Federal Judicial Review. February 15, 2016.

reportedly monitoring planning by the Midcontinent Independent System Operator (MISO), a grid organizer, for both the CPP and a more generic carbon regulated future.<sup>29</sup>

It is important to note that, in spite of the Supreme Court stay, almost all states continue to plan in some way for some kind of carbon regulation. Energy efficiency – a proven, cost-effective, and widely-available tool – will be essential in that planning. Indeed, continuing to develop and implement energy efficiency policies and programs is a 'no regrets' strategy -- that is, implementing energy efficiency now will help states meet future CPP compliance targets or other carbon regulation requirements, while delivering many other immediate benefits.

## II. Energy Efficiency's Role in State Compliance

### A. Introduction

Energy efficiency has the potential to play a very large role in CPP compliance. EPA supports the use of energy efficiency as a proven, cost-effective, and widely-available emission reduction option, and a number of analyses and reports have found that energy efficiency alone can bring some states into full compliance with their CPP goal.

Indeed, a recent ACEEE analysis found that energy efficiency could get most states more than halfway to their emissions targets.<sup>30</sup> Another recent assessment from the South-central Partnership for Energy Efficiency as a Resource (SPEER), which focused on Texas and used data from both the U.S. Energy Information Administration and the Electric Reliability Council of Texas (ERCOT), found that demand in 2030 could be reduced by as much as 10 percent using just a “modest” slate of energy efficiency incentive programs, appliance standards, and building codes.<sup>31</sup> The report found that “the cost of these programs would be far less than the combination of savings to consumers, reduced energy prices, and reduced transmission and distribution costs” and that the largest and most cost-effective potential efficiency gains are in the residential sector.<sup>32</sup>

The final rule's broadness regarding the kinds of demand-side energy efficiency that may be used for compliance purposes facilitates the potential for energy efficiency to be

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<sup>29</sup>[http://www.eenews.net/stories/1060036323?utm\\_content=buffer8930a&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](http://www.eenews.net/stories/1060036323?utm_content=buffer8930a&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer)

<sup>30</sup> ACEEE. 2016. Energy Efficiency Lowers the Cost of Clean Power Plan Compliance. <http://aceee.org/sites/default/files/ee-lowers-cost-cpp-0316.pdf>

<sup>31</sup> SPEER. March 2016. “Efficiency and the Low-Carbon Future.” <https://eepartnership.org/wp-content/uploads/2016/03/Efficiency-and-The-Low-Carbon-Future.pdf>

<sup>32</sup> Ibid.

a key part of CPP compliance. . The final rule allows for any demand-side energy efficiency measure to be used for adjusting CO<sub>2</sub> emissions under a rate-based approach provided that “the measures can be quantified and verified in accordance with the EM&V requirements in the emission guidelines.”<sup>33</sup> EPA specifically identifies a variety of energy efficiency measures, programs, and policies that can count toward compliance. Some of the measures, programs, and policies EPA explicitly identified include:

- Utility and nonutility energy efficiency programs to reduce electricity use in residential and commercial buildings, industrial facilities, and other grid-connected equipment;
- Energy savings requirements/standards (e.g., building energy codes, energy efficiency resource standards (EERS), appliance/equipment standards);
- Combined heat and power;
- Energy savings performance contracting;
- Behavioral programs; and
- Energy efficiency in water and wastewater facilities; and
- Demand response that reduces MWh energy use, among others.

A variety of parties may provide energy efficiency measures, policies, and programs : owners or operators of affected power plants, electric distribution companies, independent power producers, energy service companies, administrators of state energy efficiency programs, and private and non-profit entities. It is also important to note that EPA has indicated that states can use third parties to help with CPP administration. This could be particularly helpful in facilitating the incorporation of energy efficiency into state plans and implementing energy efficiency (and associated EM&V) for compliance purposes.<sup>34</sup>

For a comprehensive description of various energy efficiency policies, programs, and approaches that could potentially be used for CPP compliance purposes, please see a February 2016 report from SEE Action entitled “Guide for States – Energy Efficiency as a Least Cost Strategy for Greenhouse Gas and Air Pollution, and Meeting Energy Needs in the Power Sector.”<sup>35</sup>

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<sup>33</sup> 80 Fed. Reg. 64,996, page 1244

<sup>34</sup> VanNess Feldman. “Use of ‘Third-Party Entities’ for State and Federal Implementation of the Clean Power Plan: Issues and Options.” July 2016. <https://www.naseo.org/Data/Sites/1/third-party-entities-in-the-cpp-white-paper-final-7.27.16.pdf>

<sup>35</sup> <https://www4.eere.energy.gov/seeaction/system/files/documents/pathways-guide-states-final0415.pdf>

## ***B. Rate-Based vs. Mass-Based***

The final rule allows states to pick either a rate-based or mass-based approach. Under a rate-based approach, each regulated entity must achieve the mandated emission rate, measured in lbs of CO<sub>2</sub> per MWh either directly or by obtaining emission rate credits (ERCs) from zero or low carbon generation or energy efficiency. Under a mass-based plan, total emissions are capped and regulated entities must keep their emissions below their allotted cap, either by directly reducing emissions or by attaining allowances to offset their emissions.

After states choose between a rate-based or mass-based approach, they must then develop a compliance plan outlining how they will implement their interim and final goals under that approach. The original final deadline for states to submit these plans was September 6, 2018; however, EPA has indicated that the deadline will be changed due to the Supreme Court stay. As of this report's publication, EPA has not announced the revised deadline. If states do not submit an approvable compliance plan by the final deadline, EPA will impose a Federal Plan.

### **1. Energy Efficiency in Rate-Based Approach**

Under a rate-based approach, regulated entities must meet their mandated emissions rate by either reducing carbon per unit of electricity generated directly in the generation process (e.g., switching from coal to natural gas) or by reducing their need for reduction through the use of Emissions Rate Credits (ERCs), or a combination of these. An ERC is equal to one MWh of zero CO<sub>2</sub> generation or a MWh of avoided generation. Regulated entities that hold ERCs can factor them into their overall emissions rate calculations, effectively lowering their overall rates.<sup>36</sup>

States can issue ERCs to any project provider that meets eligibility criteria, and energy efficiency is automatically eligible to apply for ERCs. In order to receive ERCs, project providers must submit an eligibility application, which includes an EM&V plan that meets EPA requirements, and submit regular M&V reports on savings from the project. The state can then issue ERCs into a numbered account specific to the project provider, who can then sell the ERCs to regulated

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<sup>36</sup> For example, one pound of CO<sub>2</sub> emissions per MWh combined with zero pounds of CO<sub>2</sub> emissions per MWh (from avoided generation from energy efficiency) results in an overall emissions rate of ½ pounds of CO<sub>2</sub> emissions per MWh. The following formula illustrates this simplified example: 1 lb/MWh + 0 lb/MWh = 0.5 lb /MWh.

entities that need them for CPP compliance. The ERCs are then tracked in a tracking system.<sup>37</sup>

States can get credit for all eligible energy efficiency projects installed after 2012 so long as they are still generating savings in a compliance year. This means that energy efficiency measures and projects that are implemented today and are still achieving quantifiable and verifiable energy savings in 2022 may be eligible for ERCs and help lower a state's emission rate during the CPP compliance period.

Residential energy efficiency must consider what measures they have installed, what the baseline energy use was when the measure was installed, and what the energy savings is (and the length of time the equipment lasts). While energy efficiency measures such as insulation last more than 10 years, other energy efficiency measures, such as HVAC, may be replaced in 10-15. EM&V protocols need to quantify, aggregate and measure this savings.

## **2. Energy Efficiency in Mass-Based Plans**

Under a mass-based plan, total emissions are capped and regulated entities must submit an allowance for each ton of carbon dioxide they emit. Regulated entities can comply either by directly reducing emissions or by acquiring allowances equal to the amount they emit. A state can distribute allowances under its cap in a variety of ways. Regardless of the approach a state chooses, energy efficiency automatically "counts" toward compliance under a mass-based approach because it reduces the amount of carbon dioxide regulated entities emit, helping the state to achieve its overall cap.

Just as the ERC is the key trading mechanism under rate-based plans, the allowance is the key trading mechanism under mass-based plans. Each allowance corresponds to one short ton of CO<sub>2</sub>, and each ton of CO<sub>2</sub> a regulated entity emits must be paired with one allowance to ensure the state remains in compliance. By reducing energy demand, energy efficiency essentially reduces the need for generation by regulated entities, and thus reduces the amount of allowances regulated entities must use or buy to remain in compliance.

States may use an unlimited amount of energy efficiency in whatever form they choose to help them achieve their goals. This could include energy codes, an

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<sup>37</sup> See Section IV.C of this paper for a more detailed discussion of how an energy efficiency registry can greatly facilitate the tracking and crediting of energy efficiency projects for CPP compliance purposes.

energy efficiency resource standard (EERS),<sup>38</sup> energy efficiency financing mechanisms like property assessed clean energy (PACE),<sup>39</sup> residential energy efficiency rebate programs, appliance standards, etc. A state could even decide to fund part (or all) of the cost of these energy efficiency measures with revenue gained from allowance auctions, which creates an even stronger feedback loop of energy savings, reduced generation, and CPP compliance.<sup>40</sup>

EM&V is not required under all mass-based plans, and this is one potential benefit of the mass-based approach, as it generally allows for more flexibility and reduces the administrative burden and associated costs of energy efficiency EM&V.<sup>41</sup> However, EM&V may be required in certain cases if, for example, a state chooses to address leakage through set-aside allowances for energy efficiency,<sup>42</sup> employs direct crediting of energy efficiency (e.g., an output-based

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<sup>38</sup> An energy efficiency resource standard (EERS) requires utilities in a given state to save a certain amount of energy per year.

<sup>39</sup> Property assessed clean energy (PACE) is a financing mechanism that allows property owners – both residential and commercial – to finance up to 100 percent of the cost of energy upgrade projects and repay those costs over time via a special assessment on their property tax bill. The assessment stays with the property until it is paid off, so loan repayment responsibility transfers to the next owner if the property is sold.

<sup>40</sup> EPA released a Technical Support Document regarding allowance allocation for the Proposed Federal Plan in August 2015. That document is available at <https://www.epa.gov/sites/production/files/2015-11/documents/tsd-fp-allowance-allocations.pdf>. For more information on allowance allocation, and for a detailed discussion of why a performance-based allocation scheme would be better for energy efficiency than EPA's proposed historical allocation scheme, see the Advanced Energy Economy's February 2016 report, entitled "A Performance-Based Approach to Allowance Allocation for Clean Power Plan Compliance," available at <http://info.aee.net/allocation-for-clean-power-plan-compliance>.

<sup>41</sup> In a State Measures Plan, states have tremendous flexibility to choose an array of energy efficiency policies, programs, and measures implemented by a variety of provider types, and EM&V aligned with state requirements must be included.

<sup>42</sup> One option states may choose is a mass-based approach in which the overall CO<sub>2</sub> emissions cap is applied only to existing generating sources, and not new sources. This approach requires states to include a plan to address emissions leakage, which occurs when energy generation and subsequent CO<sub>2</sub> emissions are shifted away from existing, regulated sources to new, unregulated sources. Under the CPP final rule, one way mass-based states can mitigate leakage is by reserving, or setting aside, a percentage of CO<sub>2</sub> allowances for verified delivery of demand-side energy efficiency. A set-aside is a pool of allowances that is allocated to incentivize a defined activity or set of activities (as opposed to being distributed through a primary allocation approach). Under an energy efficiency set-side scenario, a certain percentage of a state's allowances could be directly allocated to energy efficiency providers based on delivered energy efficiency savings (CPP, *supra* note 13, at 64890). A state could also distribute the set-aside allowances to a state-approved third-party energy efficiency administrator, which would then grant the allowances to eligible energy efficiency providers.

allocation that includes savings from energy efficiency),<sup>43</sup> or participates in the CEIP.<sup>44</sup> Moreover, energy efficiency projects in states that adopt a mass-based approach would still likely be subjected to relevant state EM&V planning and reporting requirements, as well as relevant protocols to support state-specific policies. State air regulators would likely need transparency of the underlying EM&V for how energy efficiency would deliver emissions avoidance in order to approve the state's plan.<sup>45</sup>

Again, the role of EM&V under a mass-based approach will differ depending on a state's strategy. This could range from a broad quantification for the state's tracking purposes to rigorous EM&V for determining gross and net savings and the attribution of savings (e.g., determining net savings from specific programs/projects for the purposes of CEIP early action credits, energy efficiency set-asides, or direct crediting of energy efficiency). In addition, if a market emerges for energy efficiency savings, those savings would need a metric of quantification, including savings in the residential sector.

It is important to reiterate that EPA's approach to EM&V within the context of the CPP is largely based on the use of existing industry practice, protocols, and methods and encourages leveraging best practices already in place. The different EM&V approaches are discussed later in this report (see Section III.B Measurement is Key to Valuing Energy Efficiency).

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The CPP final rule explains that the Federal Plan provides for two set-asides: updating output-based allocations and an allowance set-aside for renewable energy sources. Importantly, in the final rule's discussion of the renewable energy set-aside, EPA expressly states: "[a] set-aside can also be allocated to providers of demand-side EE, or to both RE and demand-side EE." (CPP, supra note 13, at 64890). It should be noted, however, that the set-aside approach in the proposed Model Trading Rule and the proposed Federal Plan has not yet been finalized. Furthermore, energy efficiency set-asides were not included as a presumptively approvable option in the proposed Federal Plan. The EPA has not provided insight as to why the energy efficiency set-aside was omitted from the proposed Federal Plan, and many comments were submitted to EPA arguing for inclusion of an energy efficiency set-aside in the final Federal Plan.

<sup>43</sup> Under a direct crediting scenario, primary allocation of allowances would go to all eligible zero- and low-emitting technologies in direct proportion to their emission reduction benefits. The process would be comparable to how ERCs are assigned under rate-based plans, thus EM&V would be similarly required. EPA has requested comment on options for implementing an output-based allocation system for distributing allowances.

<sup>44</sup> In the CEIP Proposed Rule, EPA indicates that mass-based states wishing to participate in the CEIP must adhere to the EM&V requirements laid out in the Emissions Guidelines, at least for the time in which the state is participating in the CEIP. The language in the CEIP Proposed Rule, however, is not entirely clear on this matter and additional clarification is expected in the final CEIP rule.

<sup>45</sup> It is important to note that regulated entities ultimately face the financial liability under the CPP when compliance targets are missed. It is therefore likely that regulated entities will insist on robust EM&V, even in states taking a mass-based approach that are not required under the CPP to meet EM&V guidelines.

### C. Clean Energy Incentive Program

The Clean Energy Incentive Program (CEIP) is a voluntary program within the CPP designed to encourage early deployment of renewable energy and energy efficiency. Eligible projects receive credit for energy generated or saved in 2020 and 2021 via “early action” credits -- in the form of allowances for states choosing a mass-based approach, or ERCs for states choosing a rate-based approach. The federal government will then match these allowances/credits out of an additional, federal pool of allowances.<sup>46</sup>

In the CEIP Proposed Rule, EPA proposes that states will have flexibility to determine the types of demand-side energy efficiency projects they deem eligible for CEIP awards, but the projects have to be implemented in, or benefit, “low income communities.” A wide array of residential energy efficiency project types may therefore be considered eligible under the CEIP. EPA encourages states to reference DOE’s Guidelines for Home Energy Professionals,<sup>47</sup> DOE’s Better Buildings Workforce Guidelines,<sup>48</sup> EPA’s Healthy Indoor Environment Protocols for Home Energy Upgrades,<sup>49</sup> and ENERGY STAR’s resources for residential energy efficiency projects.<sup>50</sup> Eligible demand-side energy efficiency projects will receive double credit under the CEIP, meaning they will receive two ERCs/equivalent allowance amounts for each MWh saved.

The CEIP Proposed Rule lays out a number of eligibility requirements for energy efficiency projects.<sup>51</sup>

- **“Low income community” requirement.** As mentioned above, energy efficiency projects must be implemented in or benefit “low income communities.” EPA is proposing that it will neither create a new definition nor provide a single definition of “low income community.” Rather, EPA proposes to provide states

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<sup>46</sup> In the CEIP Proposed Rule, EPA proposes the matching pool be divided evenly, with 50 percent of the matching pool (150 million allowances, or 187.5 million ERCs) available for low-income community projects (which include energy efficiency and solar) and 50 percent for zero-emitting renewable energy projects. A list of proposed state matching pool allowances and ERCs is included in the CEIP Proposed Rule.

<sup>47</sup> <http://energy.gov/eere/wipo/guidelines-home-energy-professionals>

<sup>48</sup> <https://www4.eere.energy.gov/workforce/projects/workforceguidelines>

<sup>49</sup> <https://www.epa.gov/indoor-air-quality-iaq/healthy-indoor-environment-protocols-home-energy-upgrades>

<sup>50</sup> <https://www.energystar.gov/>

<sup>51</sup> The Home Performance Coalition has submitted comments on these provisions to further support the use of energy efficiency in the residential sector, citing suggested modifications. Those comments can be found at [http://www.homeperformance.org/sites/default/files/HPC%20Comments%20-%20CEIP%20Proposed%20Rule\\_0.pdf](http://www.homeperformance.org/sites/default/files/HPC%20Comments%20-%20CEIP%20Proposed%20Rule_0.pdf).

with the flexibility to use one or more existing state or federal definitions that best suit their specific economic and demographic conditions.<sup>52</sup>

Selected definition(s) of “low income community” may be based on a geographic area that includes low-income households, and/or a household-level income determination. EPA has proposed four existing federal definitions as approvable, including definitions under:

- The New Market Tax Credit Program;
- The Department of Housing and Urban Development’s Qualified Census Tracts;
- The Department of Energy’s Weatherization Assistance Program Income Guideline; and
- Federal Poverty Level Guidelines.

At the state level, definitions may include established utility program definitions that have PUC or state energy office (SEO) approval, eligibility requirements for state tax credits or incentives, or qualification for state administered benefit programs, among others. At the local level, definitions may include established utility program definitions administered by a municipality, a public power entity, a rural electric cooperative or other analogous utility provider not subject to state oversight. If a state includes more than one definition, it must have clear and consistent criteria for applying the multiple definitions. For instance, a state may use one definition for one type of program and another definition for another type of program, but it should not choose between the definitions for a specific program in such a way that would allow for arbitrary inclusion or exclusion of individual projects. States must include in their compliance plan the definition(s) of “low-income community” they intend to use to make CEIP awards to low-income community projects.

- **Timing.** EPA is proposing that low-income energy efficiency projects will be eligible if they “commence operation” on or after September 6, 2018. EPA’s proposed definition for “commence operation” is the date on which an eligible CEIP project in a low-income community is delivering quantifiable and verifiable electricity savings.

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<sup>52</sup> Local, state or federal definitions are considered existing if they were established prior to the publication of the final CPP Emissions Guidelines October 23, 2015. EPA is proposing that the following federal level definitions are each presumptively approvable: New Market Tax Credits, HUD Qualified Census Tracts, Weatherization Assistance Program Income Guidelines, and the Federal Poverty Level Guidelines. EPA is seeking comment on other federal level definitions that may also be considered presumptively approvable to be used in final state compliance plans.

- **Evaluation, Measurement and Verification (EM&V).** EPA has indicated that requirements for EM&V, including EM&V plans, M&V reporting, and independent verification of plans and reports must be consistent with the requirements included in the final CPP Emissions Guidelines for the issuance of ERCs. In other words, a state wishing to participate in the CEIP will have to adhere to the EM&V requirements laid out in the Emissions Guidelines, regardless of whether it opts for a mass- or rate-based approach. It should be noted that the language in the CEIP Proposed Rule will not necessarily be the same as what is ultimately included in the final rule, and many energy efficiency experts are requesting that final language provide additional flexibility. If, however, EPA does confirm in the final rule mass-based states will indeed have to adhere to the EM&V requirements laid out in the CPP Emissions Guidelines if they wish to participate in the CEIP, this could present a hurdle to those states, as some mass-based approaches do not require EM&V for general CPP compliance purposes.

In order to participate in the CEIP, states must include certain EM&V requirements in their compliance plan. This includes requirements for (1) quantification and verification of MWh results; (2) submission of M&V reports to the state, containing monitored and verified MWh savings results for a project; (3) submission of accompanying verification reports by an accredited verifier for both eligibility applications and M&V reports; and (4) state allocation or issuance of early action allowances or early action ERCs, based on quantified and verified MWh.

### **III. How to Use Residential EE Policies, Programs and Measures to Meet CPP Compliance Obligations**

#### ***A. Introduction***

The SEE Action Policymaker’s Guide to Scaling Home Energy Upgrades<sup>53</sup> provides details on four categories of particularly important and effective residential energy efficiency policies that, if addressed, can dramatically increase the energy efficiency of America’s homes:

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<sup>53</sup> SEE Action. September 2015. “A Policymaker’s Guide to Scaling Home Energy Upgrades.” [https://www4.eere.energy.gov/seeaction/system/files/documents/Residential%20Policymakers%20Guide\\_093015\\_v2.pdf](https://www4.eere.energy.gov/seeaction/system/files/documents/Residential%20Policymakers%20Guide_093015_v2.pdf)

- Incentives and financing;
- Making the value of energy efficiency visible in the real estate market;
- Data access and standardization; and
- Supporting utility system procurement of energy efficiency.

States can use the policies, program applications, and measures from each of these four categories to help them comply with the Clean Power Plan.<sup>54</sup> States looking to drill deeper into these policies should review the Guide for additional details.

Many states have decades of experience with residential energy efficiency policies and programs. Even states that do not have much experience with residential energy efficiency still have the benefit of considering best practices and lessons learned from experienced states. The key point here is that states wishing to use energy efficiency for CPP compliance do not need to start from scratch. For example, a state considering building energy codes as one of its CPP compliance options could adopt a more recent version of that code or could examine ways to improve compliance with the existing building energy codes.<sup>55</sup> Residential energy efficiency opportunities continue to expand, and states can leverage this growth – as well as build upon prior success – by taking their current energy efficiency policies, programs, and measures to the next level.

## ***B. Measurement is Key to Valuing Energy Efficiency***

To provide compliance with the CPP, the measurement of the energy savings resulting from energy efficiency policies, programs, and measures is critical.<sup>56</sup> Whether for issuing ERCs or set-aside allowances, banking energy savings in a registry, or evaluating compliance costs for state policymakers, it is important that policies are married with measurement procedures. Only quantified and verified MWhs from eligible energy efficiency during the compliance period (2022 and beyond) may be eligible for tradable ERCs or allowances. Energy efficiency that is eligible for ERCs or allowances includes

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<sup>54</sup> For a more detailed and comprehensive description of specific policies, programs, and measures from each of the four categories, please see the “SEE Action Guide for States – Energy Efficiency as a Least Cost Strategy for Greenhouse Gas and Air Pollution, and Meet Energy Needs in the Power Sector.”

<sup>55</sup> For more information on using building codes to meet CPP compliance obligations, see the ACEEE January 2015 report entitled “The Role of Building Energy Codes in the Clean Power Plan,” available at <http://aceee.org/sites/default/files/building-codes-111d-1-22-15.pdf>.

<sup>56</sup> For additional details, see EPA’s Evaluation Measurement and Verification (EM&V) Guidance for Demand-Side Energy Efficiency (EE). Draft for Public Input (August 2015) available at [https://www.epa.gov/sites/production/files/2015-08/documents/cpp\\_emv\\_guidance\\_for\\_demand-side\\_ee\\_-\\_080315.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/cpp_emv_guidance_for_demand-side_ee_-_080315.pdf). Also see EPA’s Demand-Side Energy Efficiency Support Document (August 2015), available at <https://www.epa.gov/sites/production/files/2015-11/documents/tsd-cpp-demand-side-ee.pdf>.

measures implemented after 2012 that are achieving MWh savings during the compliance period. The energy efficiency programs/measures must also be grid-connected and included in a state plan.

Energy efficiency EM&V will play an important role in CPP compliance. Standard protocols already in use to accurately measure and verify energy savings for state policies and markets (e.g., ISO/RTO capacity markets) can also support quantification of energy savings as basis for determining CO<sub>2</sub> emission reductions. While states will benefit from robust EM&V regardless of which compliance approach they choose, there are significant differences in the requirements for EM&V under each approach.

As indicated earlier, under a mass-based state plan, EM&V is not automatically required, although it is required for states that choose to participate in the CEIP, use set-asides for energy efficiency, or use direct crediting of allowances for energy efficiency.<sup>57</sup> Under a rate-based plan, EM&V is required to support ERC tracking, trading, and issuance, as well as for participation in the CEIP.

While not all of the EM&V requirements for the CPP are final,<sup>58</sup> existing EM&V approaches for demand-side energy efficiency programs are well-established in most states and can serve as a strong foundation from which to start developing compliance plans. In fact, EPA's approach to EM&V – including the regulatory provisions included in the Proposed Federal Plan and Model Trading Rule and Draft EM&V Guidance – encourages the use of existing protocols and methods and leverages best practices already in use.

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<sup>57</sup> As previously mentioned, EPA indicates in the CEIP Proposed Rule that mass-based states wishing to participate in the CEIP will have to adhere to the EM&V requirements laid out in the Emissions Guidelines, at least for the time in which the state is participating in the CEIP. The language in the CEIP Proposed Rule, however, is not entirely clear on this matter, and additional clarification is expected in the final CEIP rule. EM&V will be required for any state choosing a mass-based approach that employs set-asides for energy efficiency or direct crediting of energy efficiency.

<sup>58</sup> Certain requirements regarding EM&V are laid out in the final rule (40 C.F.R. §60.5830), and those requirements are final. However, the Proposed Federal Plan and Model Trading Rules, which includes additional presumptively approvable EM&V provisions (Section IV.D.8), and the draft Demand-Side Energy Efficiency EM&V Guidance, which provides more detailed supplemental guidance on EM&V, are not yet final. The final Federal Plan and Model Trading Rules and the final Demand-Side Energy Efficiency EM&V Guidance are expected to be released by EPA prior to 2017.

<b>Summary of CPP Requirements for Demand-side EE EM&amp;V Plans (40 C.F.R. § 60.5830)</b>
1. Quantify and verify electricity savings on a retrospective (ex-post) basis.
2. Use industry best-practice EM&V protocols and methods that yield accurate and reliable measurements of electricity savings.
3. Include an assessment of independent factors that influence energy savings.
4. Include the expected life of the savings (in years) and a baseline of expected electricity use without the EE measure.
5. Include a demonstration of how the industry best practices protocol and methods apply to the specific activity, project, measure or program for the purposes of quantifying and verifying MWh savings.
6. Explain why these protocols and methods were selected.
7. Submit ex-post reports of savings values, demonstrating how the EM&V plan was followed.

*Source: NACAA 2016. "Implementing EPA's Clean Power Plan: Model State Plans"*

As states begin to examine their existing EM&V protocols and Technical Resource Manuals (TRMs) in the context of the CPP, they must also assess their oversight processes. States should ensure that there is proper oversight by the public utility commission, a third party, and/or a government agency (e.g., state energy office) and that the oversight process is transparent, credible, and consensus-driven.<sup>59</sup> States should compare their existing EM&V practices with the requirements laid out in the final rule (40 C.F.R. §60.5830), the presumptively approvable provisions included in Section IV.D.8 of the Proposed Federal Plan, and the approaches and methods laid out in the Draft Demand-Side Energy Efficiency EM&V Guidance document ("Draft EM&V Guidance document").

EPA's Draft EM&V Guidance document in particular discusses and provides guidance on many aspects of EM&V that are relevant for residential energy efficiency, including EM&V related to whole home retrofit programs, low-income energy efficiency weatherization programs, residential behavior programs, residential new construction programs, and retrofit programs for prescriptive measures (including lighting, HVAC, water heaters, refrigerator recycling, and consumer electronics replacement).<sup>60</sup> The draft guidance (consistent with the draft Model Trading Rule) sets forth three primary EM&V approaches: project based M&V, use of comparison groups (e.g., billing analysis);

<sup>59</sup> ACEEE. February 2016. "Energy Efficiency and the Clean Power Plan: Steps to Success." <http://aceee.org/sites/default/files/ee-cpp-steps-022416.pdf>

<sup>60</sup> See Appendix C of the Draft EM&V Guidance.

and deemed savings. It also addresses the use of common practice baselines, accounting for independent factors, measure life and persistence, interactive effects, and T&D losses. The guidance also provides examples of quantifying savings from residential building energy codes and residential appliance protocols.<sup>61</sup>

Importantly, EPA has indicated that states can use third parties to help with administration of the CPP. This could be particularly helpful in facilitating the incorporation of energy efficiency into state plans and implementing energy efficiency (and associated EM&V) for compliance purposes.<sup>62</sup>

For a wide array of additional resources for energy efficiency program administrators and project managers, visit the SEE Action Evaluation, Measurement, and Verification (EM&V) Portal.<sup>63</sup> The portal includes sector-specific EM&V guidance and tools, as well as guidance for multi-sector EM&V, guidelines for reporting, measurement approaches, and more. It also includes recommended technical methods to estimate energy savings from residential behavior-based energy efficiency programs,<sup>64</sup> which is specifically referenced as an “applicable guidance document” in the CPP draft Demand-Side Energy Efficiency EM&V Guidance document. The portal focuses on approaches that are industry-recognized and that can be applied nationwide.

### ***C. Incentives & Financing***

Every state has at least some experience delivering energy efficiency programs, whether they be in the form of incentives or financing tools, administered by utilities, the state, and/or the private sector, etc. Given the large number of energy efficiency incentives and financing policies and programs that already exist in states across the country, incentives and financing policies are well-positioned as easy and low- to no-additional cost ways to boost residential energy efficiency. The issue facing the states is how and if to weave these policies into CPP compliance.

Incentives such as tax credits, deductions, rebates, and/or state sales tax exemptions on the purchase and installation of energy-efficient products, equipment, systems, and appliances, and financing tools such as revolving loan funds, on-bill programs, and

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<sup>61</sup> Please see section III.B. of this report for additional analysis of EM&V requirements.

<sup>62</sup> VanNess Feldman. “Use of ‘Third-Party Entities’ for State and Federal Implementation of the Clean Power Plan: Issues and Options.” July 2016. <https://www.naseo.org/Data/Sites/1/third-party-entities-in-the-cpp-white-paper-final-7.27.16.pdf>

<sup>63</sup> <https://www4.eere.energy.gov/seeaction/evaluation-measurement-and-verification-resource-portal>

<sup>64</sup> <https://www4.eere.energy.gov/seeaction/publication/evaluation-measurement-and-verification-emv-residential-behavior-based-energy-efficiency>

Property Assessed Clean Energy (PACE) programs can be significant drivers of energy efficiency. While incentives and financing do not create energy savings or emissions reductions in and of themselves, they do lower the upfront costs of energy efficiency projects, which can influence purchasing power and increase the number of energy efficiency projects completed or lead to larger projects that achieve deeper energy savings. The question for states will be--if they are going to include both the incentives as well as the programmatic savings--where do they assign the savings? This is more of an issue in rate-based states than in mass-based states.

Under a mass-based approach- the increased energy efficiency from an incentive or financing will displace generation and help the state achieve emissions below its allotted cap. Thus, states would know how many individuals took a tax credit or used a financing tool and use the deemed savings from those measures to understand their results. Under a rate-based approach, energy savings must be documented through approved EM&V methods, so it would be the actual energy efficiency projects spurred by new and/or enhanced incentives and financing policies that could create ERCs (as long as they adhere to the eligibility requirements). It may also be possible that a state could sell allowances or ERCs to fund incentive programs.

While incentives may be a part of the state compliance plan, they would likely be put forward to complement policies with measured savings to encourage action. Policies that states might consider to complement their plans include:

- Personal Income Tax Credit/Deduction – to help homeowners cover the cost of a home energy audit, installation of energy efficiency measures, and/or a whole home retrofit;
- State Sales Tax Exemptions – exempting high efficiency and/or weatherization products from state sales tax or having a state sales tax holiday on said products;
- Residential Energy Efficiency Rebate Programs – to offer rebates for the purchase and installation of prescriptive measures (i.e., insulation, high efficiency appliances, HVAC) and/or whole house retrofits (e.g., Home Performance with ENERGY STAR). Rebate programs can be offered through electric and gas utilities, and the state and/or local level;
- Revolving Loan Funds – to offer unsecured consumer loans with low interest rates for energy efficiency improvements;
- Loan Loss Reserve (LLR) – a credit enhancement vehicle that helps to reduce interest rates on loans for energy efficiency improvements by reducing the risk to the lender;

- Other Financing Programs – such as Warehouse for Energy Efficiency Loans (WHEEL) designed to facilitate access to low-cost capital via public investment;
- On-bill Financing – allows homeowners to pay for energy efficiency improvements over time through their utility bill; and
- Property Assessed Clean Energy (PACE) Programs – provides homeowners with capital for energy efficiency improvements, which is then repaid over time through a tax assessment connected to the property. Enabling legislation must be adopted by the state or municipality for a PACE program to be established, and the local government can then adopt an ordinance to create the special tax assessment district. PACE programs may be administered directly by the local government or through a third-party.

#### ***D. Valuing Energy Efficiency in Real Estate Transactions***

Certain policies promote a fertile environment for energy efficiency activity. For example, home labeling encourages people to participate in rebate programs because of the added value their home improvement produces. Valuing energy efficiency in real estate transactions through home energy labels (e.g., rating/score for a home’s energy performance, disclosure of a home’s energy efficiency assets, disclosure of a home’s actual energy consumption data) and the incorporation of energy costs into mortgage underwriting and appraisal processes will make energy efficiency choices visible and valuable in the marketplace, thus accelerating investment.

By enacting policies that require the sharing of information about a home’s energy efficiency and provide detail on home energy upgrades and the levels of efficiency of a homes’ energy-using/saving equipment (HVAC, insulation, windows, etc.), policymakers can further drive energy efficiency upgrades and therefore increase the overall efficiency of the housing stock within their state. It is important for policymakers to understand that adding value to a home through energy efficiency improvements will encourage voluntary carbon reductions. In addition, some policies are an important precursor to advancing energy measurement, which is critical to carbon reductions.

Under a rate-based approach or a mass-based approach that uses energy efficiency set-asides or direct crediting of energy efficiency, however, it may be difficult for these types of policies to count towards compliance because of the EM&V requirements.

Policies include:

- Home Energy Certifications/Labeling – to accurately and reliably indicate a home’s absolute and/or relative energy consumption, according to identified standards or established criteria. This also helps to support a more accurate

valuation of a home's energy use features during the appraisal and underwriting processes, and at time of resale. Examples include DOE's Home Energy Score, NAHB's National Green Building Standards, USGBC LEED for Homes, ENERGY STAR, RESNET Home Energy Rating System, and the Energy Performance Score (Energy Trust of Oregon);

- Energy Data Disclosure – requiring energy bill disclosure at time of sale allows buyers to have a more accurate indication of a home's energy consumption before the purchase contract is signed. When paired with a home energy audit, this can also provide buyers with a tailored list of recommended efficiency improvements to act upon if they decide to purchase the home;
- Utilizing the Multiple Listing Service (MLS) – creating and encouraging the use of MLS fields to provide information on energy efficiency features to home purchasers and real estate agents. MLS fields could include a score (e.g., HERS rating, Home Energy Score), any relevant certifications (e.g., ENERGY STAR, LEED for Homes), energy consumption data, and specific home energy features (e.g., ENERGY STAR windows, HVAC model, insulation type); and
- Incorporating Energy Use in the Appraisal Process – update state licensure requirements to ensure appraisers are properly trained to appraise energy efficient homes. For example, appraisers should be trained to use Appraisal Institute's Residential Green and Energy Efficient Addendum (G&EEA), which was designed to allow appraisers to document the energy efficiency features of a home for appraisal purposes.

### ***E. Data Access & Standardization***

Data access and standardization policies are important to a future of enhanced energy efficiency EM&V. Low-cost, easily-accessible, and detailed utility data could significantly enhance EM&V of energy efficiency projects. This is especially true when combined with interval data from advanced metering infrastructure (AMI) and smart devices in the home that disaggregate the information to better understand which measures are producing what energy savings. This could allow the energy savings from implemented efficiency projects/measures to be quantified with a high degree of accuracy and increases the likelihood that they will meet the EM&V requirements laid out in the CPP. It also provides valuable information on how programs or policies are working to achieve their goals in near-real time as much of this data can be transferred using wireless communications technology and software analytics. EPA's Proposed Model Trading Rule encourages the use of comparison group methods using randomized

control trials (RCT) for which use of advanced data analytics, cloud computing, and AMI can help to streamline EM&V for whole-house retrofit projects and programs.

Data access and data standards policies can lead to easier and more cost-effective quantification of energy data, which will be especially important for states choosing a plan subject to federal EM&V guidelines. The lower administrative costs may also trickle down to enhance the consumer value proposition and thus increase consumer uptake of energy efficiency projects.

In addition, data access and standards policies could also help to enable aggregation of energy efficiency projects. While the average individual home pollutes twice as much as two average cars – it still takes a lot of home energy savings to reduce a ton of carbon emissions. As a result, aggregation is crucial to incorporating energy efficiency into a CPP compliance plan. In addition, aggregation allows energy efficiency to be monetized into a tradable commodity. In the context of the CPP, standardized projects could be aggregated and traded as allowances (for mass-based states) or ERCs (for rate-based states) in interstate trading schemes, as long as EM&V requirements are met.<sup>65</sup> Standardization of both the data and corresponding energy improvements will allow for better evaluation and increased certainty.

Policies include:

- Consumer Access to Energy Data – allow consumers to access their electricity usage data and share that data with an approved third party. This can be facilitated through implementation of DOE’s Green Button and Green Button Connect My Data. Importantly, this is largely a state issue and both California and Texas have enacted access to data policies; and
- Data Collection and Transfer Standards – to reduce the cost of data collection and management, improve the quality and comparability of data within and across energy efficiency programs, and facilitate communication on an industry-wide basis. BPI has developed a number of useful standards, including BPI-2100,

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<sup>65</sup> Interstate trading can be more cost-effective than single-state trading because of the larger market associated with multiple states. Interstate trading does, however, require a higher level of coordination and cooperation between states wishing to engage in a trading scheme. To participate in interstate trading under the CPP, a state must either coordinate with other states to submit a multi-state plan or they must submit a “trading ready” plan that allows regulated power plants to use credits obtained out of state for compliance purposes. For the most part, only mass-based states may trade with mass-based states, and likewise rate-based states may only trade with rate-based states.

BPI-2200, and BPI-2101.<sup>66</sup> Many states have found that it is most cost-effective to encourage the adoption of these standards either prior to the launch of a new program or shortly thereafter as the program is developing its data infrastructure and protocols. Another cost-effective option is to encourage adoption when a program is upgrading or overhauling its data system.

## **F. Utility Procurement of Energy Efficiency**

Policies related to the utility procurement of energy efficiency can also be used to drive efficiency gains and help states comply with their CPP goals. An important policy option is an energy efficiency resource standard (EERS), which is explicitly mentioned in the final CPP as one of the energy efficiency policies that can count towards compliance. An EERS establishes long-term energy savings targets, measured as reductions in energy sales. Both utilities and non-utility program administrators meet their targets through energy efficiency programs, including those geared towards residential consumers. The EERS has proven a significant driver of energy efficiency investment and encourages utilities to create or expand residential end-use energy efficiency programs.

Another policy option is decoupling, which can help remove the disincentive for utilities to promote energy efficiency. Under traditional rate structures, utilities increase their revenue by selling *more* energy, which means energy efficiency and the resulting reduction of energy sales –has a negative impact on utility profits. Decoupling refers to a set of regulatory mechanisms designed to separate utility revenues and profits from energy sales, thereby helping to remove the inherent barrier to utility investment in energy efficiency. Combining decoupling with financial incentives that reward utilities for their energy efficiency investments can actually make energy efficiency profitable for utilities, which increase the likelihood that they will pursue investment.

Cost-effectiveness testing, more specifically the reform of current testing methods, may be necessary if states wish to use ratepayer funds to advance energy efficiency programs. Current cost-effectiveness tests are largely unbalanced, and thus inaccurate at assessing the total costs and benefits of demand-side energy efficiency programs. The primary problem is that costs are easier to measure than benefits; many states' tests capture all the costs, but only some of the benefits. As a result, many states

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<sup>66</sup> BPI-2100 Data Transfer Standard (also known as “Home Performance XML” or “HPXML”) is a standard protocol for transferring data from one software system to another. BPI-2200 Data Collection Standard creates a common “vocabulary” for the residential energy efficiency industry, including terms related to buildings, energy consumption and energy conservation measures. BPI-2101 Home Performance Certificate identifies a standard set of data about home energy upgrades that programs can transfer to MLS databases. For more information, see <http://www.homeperformance.org/policy-research/projects-initiatives/data-standards>.

systematically and significantly under-invest in energy efficiency. With the proper reforms in place,<sup>67</sup> cost-effectiveness tests will be able to produce a much more accurate assessment of which energy efficiency programs are cost-effective, allowing for better-informed and smarter investments. It is important to understand that while reforming cost-effectiveness testing does not reduce energy use in and of itself, it allows programs, such as deep home energy retrofits, to pass the “test” required to use ratepayer dollars to undertake programs. This would help stimulate greater overall energy savings over time, resulting in greater levels of displaced emissions from regulated power plants and more progress towards CPP compliance.

Policies include:

- EERS – requiring utilities to meet a certain percentage of their customer’s energy needs through the creation and/or enhancement of energy efficiency programs (including residential sector programs) to support increased efficiency over time. Energy efficiency targets should be mandatory and span a number of years;
- Decoupling and Utility Incentives – delinking a utility’s revenues from energy sales (decoupling) while also providing incentives to encourage successful development and implementation of energy efficiency programs to help reduce the inherent disincentive to invest in energy efficiency that exists under the traditional utility compensation structure; and
- Cost-Effectiveness Testing – ensure that tests account for all relevant costs and benefits, especially those associated with energy efficiency, and that they follow best practices in a transparent and useful manner. This can be accomplished through the reform of existing tests or the implementation of a new test that adheres to the recommendations of the National Efficiency Screening Project, which promotes cost-effectiveness tests that align with state policies.<sup>68</sup>

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<sup>67</sup> At present, a group of national experts is creating a National Standard Practice Manual (NSPM) designed to create guidance that will enable states to create better, more accurate tests. The NSPM will draw in part on the Resource Value Framework, a set of principles and best practices for cost-effectiveness testing developed by experts and industry stakeholders in 2013. For more information on the Resource Value Framework, see: [http://www.homeperformance.org/sites/default/files/nhpc\\_nesp-recommendations\\_20140816.pdf](http://www.homeperformance.org/sites/default/files/nhpc_nesp-recommendations_20140816.pdf) and <http://www.nationalefficiencyscreening.org/about-resource-value-network>. For more information on the National Efficiency Screening Project working to create the NSPM, visit: <http://www.nationalefficiencyscreening.org/>.

<sup>68</sup> The National Efficiency Screening Project. August 2014. “The Resource Value Framework: Reforming Energy Efficiency Cost-Effectiveness Screening.” [http://www.homeperformance.org/sites/default/files/nhpc\\_nesp-recommendations\\_20140816.pdf](http://www.homeperformance.org/sites/default/files/nhpc_nesp-recommendations_20140816.pdf)

## **G. Getting Credit & Generating Value**

The way in which energy efficiency can get “credit” and generate value within the context of the CPP depends on the compliance approach each state takes. Under a rate-based approach, energy efficiency projects can receive ERCs for quantified and verified energy savings achieved. These ERCs will have real value, as regulated power plants not capable of meeting their designated emissions rate on their own must purchase ERCs to bring their emissions rate back into compliance. Energy efficiency project developers can sell their ERCs to power plants in their state, and may have an opportunity to engage in a regional ERC trading market should their state choose to engage in a regional trading plan.

Under a mass-based approach, EPA places a cap on how much CO<sub>2</sub> a state’s power plants can emit. States then distribute an equivalent number of allowances –essentially licenses to emit a short ton of carbon into the atmosphere. States can sell these allowances for a set price, auction them off, or allocate them in some other fashion. If a state chooses to auction its allowances, it can use the proceeds to make direct investments in energy efficiency programs and projects. NYSERDA, for example, utilized a portion of their RGGI proceeds to advance home performance. Importantly, the projects those proceeds supported were not subject to cost-effectiveness tests and therefore had flexibility to produce deeper retrofits. If a state chooses to allocate allowances, it can prioritize energy efficiency in that allocation process or set aside a portion of allowances for energy efficiency providers as long as EM&V requirements are met.<sup>69</sup>

Regardless of which approach a state decides to take, a national energy efficiency registry could be very helpful in ensuring accurate tracking, accounting, and crediting of energy savings (and corresponding CO<sub>2</sub> reductions) from qualified energy efficiency projects. A national registry will also help to simplify and encourage the use of energy efficiency to meet CPP compliance obligations. Through the use of standardized EM&V reporting that provides transparency of EM&V plans and practices, and adherence to CPP EM&V requirements, including the level of savings rigor, a national registry would allow states to more accurately and reliably track all of the measured and verified energy efficiency-related CO<sub>2</sub> reductions that have occurred as a result of energy efficiency projects and programs in their states. By serving as a catalog for verified energy efficiency-related CO<sub>2</sub> reductions, a national registry would also provide

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<sup>69</sup> ACEEE. February 2016. “Energy Efficiency and the Clean Power Plan: Steps to Success.” <http://aceee.org/sites/default/files/ee-cpp-steps-022416.pdf>

administrative support for states and the federal government to track and credit energy efficiency-related CO<sub>2</sub> reductions over time.

In the residential context, it is unlikely to be cost-effective to register one home project. However, a large group of home energy savings measures could lead to “bankable” energy savings worth including in a registry by an aggregator. By incorporating all of this information into a single place using standardized forms, the registry would serve as a valuable tool to allow states to organize and track registered energy efficiency projects. The registry would also help avoid double counting and could support the exchange of energy efficiency credit and allowance trading across states.

While a comprehensive national energy efficiency registry does not currently exist, many of the essential elements for such a registry are already in place as a result of states’ experience with renewable portfolio standards and renewable energy certificates (RECs) tracking. The proposed National Energy Efficiency Registry (NEER) project<sup>70</sup> serves as an example of a comprehensive registry for which operating rules are in process of being developed. As mentioned previously, EPA has indicated in the CPP it is open to states utilizing third party entities, including registries, to assist with CPP administration.<sup>71</sup>

## ***H. Prioritizing EE Policies, Programs and Measures***

The impact and cost-effectiveness of the energy efficiency policies, programs and measures discussed above will vary by state, and each state should thoughtfully consider how to best prioritize energy efficiency compliance options.

In general, states without a strong foundation of energy efficiency policies may want to first prioritize adopting those policies that establish a fertile ground for solid policy, such as an EERS, data access, and/or utility cost-effectiveness testing. Once there is access to data, ability to advance programs, and utility interest in advancing energy efficiency (via EERS or other policies), other policies and incentives can grow organically. Again, each state should consider its own unique circumstances and existing policy structures as it

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<sup>70</sup> A Department of Energy grant funds the Tennessee-led NEER project. For more information see:

<http://www.theclimateretry.org/thoughtleadership/energy-efficiency/> and <https://www4.eere.energy.gov/seeaction/sites/default/files/pdfs/TCR%20SEE%20Action%20Webinar%2011-05-15.pdf>.

<sup>71</sup> VanNess Feldman. “Use of ‘Third-Party Entities’ for State and Federal Implementation of the Clean Power Plan: Issues and Options.” July 2016. <https://www.naseo.org/Data/Sites/1/third-party-entities-in-the-cpp-white-paper-final-7.27.16.pdf>

works to prioritize energy efficiency compliance options. Some of the foundation-setting policies are difficult politically; however, they could help a state leap-frog to CPP compliance.

A number of modelling tools have been developed that can help states prioritize their approach to energy efficiency for CPP compliance purposes. A more detailed discussion of those tools can be found below.

## IV. Comparing Compliance Options and Making Decisions

### A. Tools for States

As previously discussed, the CPP allows states to choose from many pollution-reducing technologies and policies –including those related to energy efficiency – when designing their compliance plans. Due to the scope and complexity of the final rule, state air and energy officials will need analytical tools to evaluate the numerous options available under the CPP’s emissions reduction requirements. Several modeling tools have been developed to help states understand the potential that certain compliance options have to help them reach their CPP goals by estimating the costs and emissions benefits of various energy efficiency programs, policies, and measures.

Below are just some of the tools and models that have been developed to help states identify which policies, programs, and technologies may have the greatest impact for the least amount of resources in a particular state. For additional information on these and other types of planning and modeling tools and approaches available to states, see the Synapse Energy Economics February 2016 synopsis, entitled, “A Guide to Clean Power Plan Modeling Tools – Analytical Approaches for State Plan CO<sub>2</sub> Performance Projections.”<sup>72</sup>

- **State and Utility Pollution Reduction Calculator Version 2 (SUPR 2).** This tool from ACEEE allows users to select from nineteen policies and technologies, including energy efficiency, renewable energy, nuclear power, emissions control, and natural gas, then calculates energy, pollution, and monetary savings;<sup>73</sup>

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<sup>72</sup> Synapse Energy Economics Guide to Clean Power Plan Modeling Tools (February 2016). [www.synapse-energy.com/sites/default/files/Guide-to-Clean-Power-Plan-Modeling-Tools.pdf](http://www.synapse-energy.com/sites/default/files/Guide-to-Clean-Power-Plan-Modeling-Tools.pdf).

<sup>73</sup> ACEEE. February 2016. “Energy Efficiency and the Clean Power Plan: Steps to Success.” <http://aceee.org/sites/default/files/ee-cpp-steps-022416.pdf>

- **Clean Power Plan Planning Tool (CP3T).** This tool from Synapse and Argonne National Laboratory enables users to adjust fossil fuel unit capacity factors, renewable energy and energy efficiency projections, unit retirements, and 111(b) unit additions for their specific state and then compare generation, capacity, emissions, and cost differences associated with various scenarios;
- **Clean Power Plan Compliance Tool.** This tool from MJ Bradley lets users analyze state progress toward compliance with the final CPP rule under a range of electricity demand and generation scenarios and a variety of emissions reduction targets. The tool incorporates policy options outlined in the final rule, and provides the ability to alter all major drivers of state electric-sector emissions and ascertain their impacts on the state’s CPP compliance status;
- **State Tool for Electricity Emissions Reduction (STEER).** This open access integrated resource planning model from the Advanced Energy Economy (AEE) was designed to help users analyze least-cost strategies for CPP compliance on a state by state basis. STEER models are currently available for Michigan, Pennsylvania, Arkansas, Virginia, Illinois, and Florida; and
- **Western States Clean Power Plan Evaluation Model.** This tool from Energy Strategies, Fovea, LLC, and the Center for the New Energy Economy (CNEE) at Colorado State University was designed to evaluate CPP compliance pathways in Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming, as well as the Ute and Navajo tribal jurisdictions. The tool allows users to quantify the CO<sub>2</sub> reductions required to meet EPA’s interim and final targets and evaluate combinations of measures, including opportunities to trade compliance instruments between states.

In addition to the modeling tools listed above, a number of guides are available to help state officials understand how to best incorporate energy efficiency into their CPP compliance plans. For example, a 2016 report from SEE Action entitled “Guide for States – Energy Efficiency as a Least Cost Strategy for Greenhouse Gas and Air Pollution, and Meet Energy Needs in the Power Sector”<sup>74</sup> provides a comprehensive overview of various energy efficiency policies, programs, and approaches that could potentially be used for CPP compliance and state and other federal clean air and clean energy requirements compliance. In addition, the National Association of Clean Air Agencies (NACAA) has published two resources that could be very helpful for state policymakers: a technical document that identifies a number of programs and policies that states

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<sup>74</sup> SEE Action. February 2016. “Guide for States – Energy Efficiency as a Least Cost Strategy for Greenhouse Gas and Air Pollution, and Meet Energy Needs in the Power Sector.”

<https://www4.eere.energy.gov/seeaction/system/files/documents/pathways-guide-states-final0415.pdf>

could employ to reduce CO<sub>2</sub> emissions,<sup>75</sup> and a comprehensive guide with model compliance plans that include detailed recommendations and sample regulatory language to help regulators incorporate energy efficiency in both rate-based and mass-based scenarios.<sup>76</sup>

For states looking to advance energy efficiency in low-income communities as part of CPP compliance, ACEEE has developed a guide: “Best Practices in Developing Energy Efficiency Programs for Low-Income Communities and Considerations for Clean Power Plan Compliance.”<sup>77</sup> In addition, a February 2016 report summarizing EPA-administered energy efficiency programs geared towards low-income communities may also serve as a helpful reference for states as they consider how they might include low-income energy efficiency into their compliance plans.<sup>78</sup> For additional reports, guidance, and resources, see *Section VI, Resources for State Officials*.

## V. Conclusion

The EPA has made it clear throughout the development of the Clean Power Plan that it considers energy efficiency an important and integral part of state compliance strategies. Energy efficiency has the advantage of reducing all types of power plant-related emissions simultaneously by avoiding the need to generate electricity in the first place.

Energy efficiency programs work – they have been tested, and they are ready to expand with ever newer and more innovative technologies. It is cheaper to fund energy efficiency, and thereby reduce energy use, than it is to pay for new energy generation. As utilities and states consider their choices to clean up electricity generation, energy efficiency needs to be a critical part of the mix because it provides the highest return-on-investment of any other strategy. And the residential sector needs to be a part of the solution.

Residential energy efficiency stands out not only as a prime opportunity for mining energy and emissions savings from homes, but as a part of improving the overall health of the American economy while tackling the threat of climate change. Policies that help residential homes reduce their energy use simultaneously help meet emissions targets and reduce the impact of utility investments with cleaner energy sources. Continuing and making new investments in

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<sup>75</sup> NACAA. “Implementing EPA’s Clean Power Plan: A Menu of Options.” May 2015.

[http://www.4cleanair.org/NACAA\\_Menu\\_of\\_Options](http://www.4cleanair.org/NACAA_Menu_of_Options) NACAA

<sup>76</sup> “Implementing EPA’s Clean Power Plan: Model State Plans.” May 2016.

[http://www.4cleanair.org/NACAA\\_Model\\_State\\_Plans](http://www.4cleanair.org/NACAA_Model_State_Plans)

<sup>77</sup> <http://aceee.org/sites/default/files/cpp-low-income-0416.pdf>

<sup>78</sup> Additional information and a link to the report summarizing EPA-administered programs is available at

<https://www.epa.gov/statelocalclimate/energy-efficiency-and-renewable-energy-low-income-communities>.

energy efficiency is a win-win-win for states – it will reduce CPP compliance costs, help meet other state and federal policy goals, and bring immediate benefits to consumers, including reduced energy bills.

Perhaps most importantly, policymakers can't look only to price increases or commercial buildings and renewable energy to find their carbon savings. While these may be greater resources for energy savings, Americans need to be a part of the solutions and benefits from policies to reduce carbon. By focusing on homes, policymakers bring people into the process. While this report has outlined **how** the residential sector fits into the CPP, it is key to remember the **why**. People do not live in commercial or industrial buildings. They do not live in power plants or solar fields. People live in homes. And homes need to be a part of CPP compliance.

## VI. Resources for State Officials

### Modelling Tools / Calculators

- ACEEE State and Utility Pollution Reduction (SUPR) Calculator Version 2  
<http://aceee.org/research-report/e1601>
- Synapse CP3T Calculator  
<http://www.synapse-energy.com/tools/clean-power-plan-planning-tool-cp3t>
- MJ Bradley Clean Power Plan Compliance Tool  
<http://www.mjbradley.com/about-us/case-studies/clean-power-plan-evaluation-tools>
- AEE STEER Model  
<http://info.aee.net/steer>
- Western States Clean Power Plan Evaluation Model  
<http://www.westernstatecppmodeling.org/>
- Synapse Energy Economics Guide to Clean Power Plan Modeling Tools (February 2016)  
[www.synapse-energy.com/sites/default/files/Guide-to-Clean-Power-Plan-Modeling-Tools.pdf](http://www.synapse-energy.com/sites/default/files/Guide-to-Clean-Power-Plan-Modeling-Tools.pdf).

### ACEEE

- CPP Resource Page  
<http://aceee.org/topics/clean-power-plan>
- “Best Practices in Developing Energy Efficiency Programs for Low-Income Communities and Considerations for Clean Power Plan Compliance” (April 2016)  
<http://aceee.org/sites/default/files/cpp-low-income-0416.pdf>

- “Energy Efficiency and the Clean Power Plan: Steps to Success” (February 2016)  
<http://aceee.org/sites/default/files/ee-cpp-steps-022416.pdf>

#### **AEE**

- “A Performance-Based Approach to Allowance Allocation for Clean Power Plan Compliance” (February 2016) – describes an allowance allocation approach that could allow for direct crediting of energy efficiency and create a more open and competitive marketplace with lower compliance costs.  
<http://info.aee.net/allocation-for-clean-power-plan-compliance>

#### **AJW**

- “Simplifying Energy Efficiency for States – Utilizing and Incentivizing Energy Efficiency-Related Greenhouse Gas Reductions under the Clean Power Plan’s Mass-Based Approach” (December 2015)  
<http://ajw-inc.com/wp-content/uploads/2015/12/151210-Mass-based-Allocation-White-Paper-FINAL.pdf>

#### **Alliance to Save Energy**

- Factsheets on the role of energy efficiency in the CPP  
[www.ase.org/cleanpowerplan](http://www.ase.org/cleanpowerplan)

#### **Department of Energy Office of Energy Efficiency & Renewable Energy**

- Energy Efficiency Savings Opportunities and Benefits – a compilation of resources and studies on using energy efficiency policies to reduce carbon emissions, incorporating energy efficiency programs into state climate and energy planning, and technical resources to understand the energy and carbon savings from efficiency.  
<http://energy.gov/eere/slsc/eeopportunities>
- Energy Efficiency Potential Studies Catalog - a compilation of state and local energy efficiency potential studies that can be used to help support energy efficiency program planning, state goal setting, utility resource planning, and other priorities.  
<http://energy.gov/eere/slsc/energy-efficiency-potential-studies-catalog>

#### **Environmental Protection Agency**

- Clean Power Plan website: <http://www2.epa.gov/carbon-pollution-standards>
- CPP Toolbox for States: <http://www2.epa.gov/cleanpowerplantoolbox>
- CPP Emission Guidelines (Final): <http://www.epa.gov/airquality/cpp/cpp-final-rule.pdf>
- Proposed Federal Plan and Model Trading Rules:  
<http://www.epa.gov/airquality/cpp/cpp-proposed-federal-plan.pdf>
- Draft EM&V Guidance Document: <http://www2.epa.gov/cleanpowerplantoolbox/draft-evaluation-measurement-andverification-guidance-demand-side-energy>

## **NACAA**

- “Implementing EPA's Clean Power Plan: A Menu of Options” (May 2015) - a technical document that identifies a number of programs and policies that states could employ to reduce CO<sub>2</sub> emissions.  
[http://www.4cleanair.org/NACAA\\_Menu\\_of\\_Options](http://www.4cleanair.org/NACAA_Menu_of_Options) NACAA
- “Implementing EPA’s Clean Power Plan: Model State Plans” (May 2016) – a comprehensive guide and model compliance plan to help states with CPP implementation; includes detailed recommendations on how to incorporate energy efficiency into compliance plans under both rate-based and mass-based scenarios.  
[http://www.4cleanair.org/NACAA\\_Model\\_State\\_Plans](http://www.4cleanair.org/NACAA_Model_State_Plans)

## **NASEO**

- Energy-Air Resource Hub  
[www.111d.naseo.org](http://www.111d.naseo.org)
- ASQ (Answers to State Questions) Portal - a platform for state officials to ask questions and read answers to frequently asked questions.  
[www.111d.naseo.org/asq](http://www.111d.naseo.org/asq)

## **SEE Action**

- “Guide for States – Energy Efficiency as a Least Cost Strategy for Greenhouse Gas and Air Pollution, and Meet Energy Needs in the Power Sector” (February 2016) – a comprehensive guide designed to provide information to state decision makers and staff on options to advance energy efficiency through strategies designed or implemented at the state and local levels of government and in the private sector.  
<https://www4.eere.energy.gov/seeaction/EEpathways>

## **VanNess Feldman**

- “Use of “Third-Party Entities” for State and Federal Implementation of the Clean Power Plan: Issues and Options” (July 2017) - explores possible roles for private or public sector entities to help states implement components of the CPP, including incorporation of energy efficiency, verifying project eligibility, accrediting independent verifiers, providing tracking infrastructure for ERCs or allowances, and other registry and related services to support state issuance and management of ERCs and allowances.  
<http://naseo.org/Data/Sites/1/third-party-entities-in-the-cpp-white-paper-final-7.27.16.pdf>