Comments of the American Council for an Energy-Efficient Economy On the Environmental Protection Agency's Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units; Final Rule

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Overview

We commend the Environmental Protection Agency (EPA) for recognizing the importance of flexibility for states by allowing multiple approaches to be used in state compliance plans. In order to ensure that states can take advantage of this flexibility, it is vitally important that EPA send a clear message to states that inclusion of end-use energy efficiency in a state plan, regardless of the state's approach, is not only permissible but encouraged. To this end we request that EPA make very clear that end-use energy efficiency[1] is an acceptable compliance method within a state or federal plan, regardless of whether that plan is mass-based or rate-based. We also request simple and transparent guidance from EPA on a number of policies and programs states can adopt that will be presumptively approvable if included in a plan. Providing this type of certainty will help states to implement the lowest-cost, most effective means for reducing carbon dioxide from their existing power plants.

In addition to these requests we include suggestions to maximize incentives for investment in energy efficiency, request clarity on the proposed Clean Energy Incentive Program (CEIP), and make recommendations on the treatment of combined heat and power (CHP). The overarching recommendations contained in this document are:

- Clarify that end-use energy efficiency can be used to meet a state's compliance obligations under any type of state or federal plan
- Provide guidance and models in the model rule outlining methods states could use to incentivize energy efficiency in a mass-based plan
- Provide straightforward guidance on how states can take credit for energy efficiency programs and policies in a rate-based plan
- Improve incentives for early investments in energy efficiency
- Improve certainty and incentives for investments in CHP

We have also partnered with a number of energy efficiency professionals to develop recommendations for treatment of the evaluation, measurement, and verification (EM&V) of energy savings. We have included the bulk of these recommendations in a joint submission filed separately, but we have also provided them here as Appendix B.

We have attempted to keep our comments brief and direct, but welcome further discussion on any of the issues we raise or any issues EPA may be considering regarding the treatment of energy efficiency in the Clean Power Plan. We are grateful for the opportunity to comment and excited about the role of energy efficiency in this important rulemaking.

[1] Throughout this document we use the phrase *energy efficiency* to refer to demand-side management energy efficiency measures, programs, policies, and projects, including combined heat and power (CHP).

Clarify that end-use energy efficiency can be used to meet a state's compliance obligations under any type of state or federal plan

STATE PLANS

While the Clean Power Plan clearly permits end-use energy efficiency to help a state meet its compliance goals, there is still considerable confusion among states on this point. We request that EPA make it clear and prominent in the model rules, any new rulemaking language, and any accompanying materials and guidance, that a state may opt to use energy efficiency to meet up to 100% of its compliance obligation. Later sections of these comments lay out specific additional steps EPA could take to assist states in understanding how energy efficiency can fit into their plans.

FEDERAL PLAN

EPA requested comment on the treatment of end-use energy efficiency in a federal plan. We first ask that EPA commit to including energy efficiency in the federal plan as a compliance option, regardless of the approach selected for that plan. If EPA imposes a plan that does not allow energy efficiency as a path toward compliance, it will be imposing unnecessarily burdensome regulation and expense.

Energy efficiency is a lowest-cost option for states to comply with the rule while supplying affordable, reliable electricity to their residents and businesses. Research by the Lawrence Berkeley National Laboratory and ACEEE shows that at a range of about 2 to 5 cents per kilowatt-hour (kWh) and an average of 2.8 cents per kWh, energy efficiency programs cost two to three times less than generating power from traditional sources.[2] States that invest in energy efficiency can reduce emissions at a lower cost than is possible through other options, while lowering customer bills and boosting their local economies through job creation.

Additionally we recommend that EPA select a mass-based federal plan approach, for two reasons. First, the majority of states have indicated a preference for the mass-based approach. If EPA follows suit it will create the opportunity for regulated entities in states with federal plans to access markets where allowances might be available at a lower cost. Market-based regulation helps to ensure that the lowest-cost pollution reduction options are available to the regulated entities. A mass-based federal plan will provide access to a more robust market of options.

Second, EPA steps into the shoes of a state when a federal plan is implemented. In those cases EPA may have the authority to require a wide variety of activities and investments, but there is probably a limit to the variation and complexity of the compliance approaches that EPA could successfully administer on behalf of a state. Under a mass-based approach, EPA could impose a tonnage cap obligation on electric generating units (EGUs) and leave administration of energy efficiency to the regulatory system that is already in place (likely the utilities working with the

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[2] Megan A. Billingsley, Ian M. Hoffman, Elizabeth Stuart, Steven R. Schiller, Charles A. Goldman, and Kristina LaCommare, *The Program Administrator Cost of Saved Energy for Utility Customer-Funded Energy Efficiency Programs*, Lawrence Berkeley National Laboratory (2014), emp.lbl.gov/sites/all/files/lbnl-6595e.pdf. See also Maggie Molina, *The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs*, Washington, DC: ACEEE, 2014, aceee.org/research-report/u1402.

public utility commission). This would create an incentive for the EGUs to reduce emissions, and end-use energy efficiency would fit the bill. However this represents only a minimal level of support for energy efficiency. It would be much better if the federal plan could go further by awarding allowances directly to energy efficiency providers. We recommend that EPA first allocate allowances to energy efficiency and other zero-emission sources. EPA could base the allocation on a formula (outlined in our comments below on mass-based allocation) and develop a certification process for projects.

EPA could, of course, administer a rate-based federal plan, but this would involve additional complexity and would be difficult to administer without engaging in dispatch and generation resource decisions, typically areas that lie outside of EPA's authority and expertise. While we recommend that the federal plan be mass-based, if EPA chooses a rate-based federal plan, then emission rate credits (ERCs) should be available to affected electric generators and other entities such as third-party efficiency providers. Application requirements should require certification (discussed below) and adherence to the EM&V guidelines, including protections against double-counting of savings.

Whether EPA selects a rate- or a mass-based federal plan, the plan will require certification of energy savings and/or emission reductions so that allowances or ERCs may be awarded. EPA could act as the certifier, or it could delegate the authority to other certifiers such as entities (e.g., a registry), individuals (through training or demonstration of expertise), or both. EPA should establish criteria and a process to certify evaluation contractors to conduct and/or certify energy efficiency evaluation results in states subject to a federal plan. There is also a multistate process to establish rules for an energy efficiency registry. We recommend that EPA provide a process for this registry and similar efforts to seek approval so that they may serve as certification options.

We think it is worth reiterating that regardless of whether EPA selects a mass- or a rate-based approach for the federal plan, it should include end-use energy efficiency as a path to compliance.

Provide guidance and models outlining methods states could use to incentivize energy efficiency in a mass-based plan

Compliance with a mass-based plan approach is determined by measuring the volume of carbon dioxide pollution emitted by the smokestacks of regulated entities. This means that states can effectively take credit for energy efficiency without submitting to EPA the details of how the energy savings were achieved. While end-use energy efficiency reduces the volume of pollution emitted by EGUs, the electric grid and existing regulatory framework in many states create barriers to investment in energy efficiency. Incentive-based environmental regulations aim to help regulated entities find the lowest-cost options for compliance, but this approach only works if incentives are properly aligned. In order to ensure that incentives are aligned to encourage energy efficiency and overcome existing barriers to investment, EPA should provide model language and guidance that outlines methods states should consider. We strongly recommend that EPA include the following two options for states to incentivize energy efficiency in the model rule for a mass-based plan:

- An auction of allowances, with a mechanism that reinvests proceeds in end-use energy efficiency measures
- Direct allocation of salable allowances to energy efficiency providers and project developers

Recommendations for how EPA could design guidance on both of these options follow. Several options are also discussed in a separate set of joint comments developed by a number of regional energy efficiency organizations and others. Those comments are available here: https://eepartnership.org/wp-content/uploads/2014/03/Final-Model-Trading-Rule-Federal-Plan-Comments-1.21.16.pdf.

AUCTIONS WITH REINVESTMENT IN ENERGY EFFICIENCY

This model is in practice in many of the states participating in the Regional Greenhouse Gas Initiative (RGGI). While RGGI provides a valuable example, EPA should provide guidance on how states might incorporate this type of approach into a plan submission for the Clean Power Plan. In addition EPA should advise on how a state could implement such an approach to maximize the incentive for energy efficiency. Questions EPA might address include:

- How would an auction be administered and executed? What steps or processes are needed?
- What authorities must a state regulator consult, if any?
- How often should the auctions be held and for what time periods (e.g., annually; every three years covering the next three years' worth of available allowances)?
- Who can participate in the auction?

These are only a few of the questions that, if answered, could help states develop plans that incentivize energy efficiency. In addition EPA can provide valuable guidance on how best to reinvest revenues once the proceeds from the auction are collected. Regardless of program design, the RGGI experience shows us that revenues can be spent to fund investments in energy efficiency that provide complementary emission reductions.[3] This method is well suited to fund utility- or state-administered programs, but EPA should provide guidance on how this approach could also be used to incentivize investments by the private sector.

One option that could help ensure that revenues are used to incentivize the lowest-cost compliance path is to make some portion of the funds generated from the auction available to energy efficiency providers and other clean energy providers through a public bidding process.

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[3] The Regional Greenhouse Gas Initiative (RGGI), *Investment of RGGI Proceeds through 2013,* Regional Greenhouse Gas Initiative (2015), www.rggi.org/docs/ProceedsReport/Investment-RGGI-Proceeds-Through-2013.pdf. Energy efficiency made up 57% of 2013 investments and 62% of cumulative investments. Programs funded by these investments are expected to return more than $2.3 billion in lifetime energy bill savings to 1.2 million participating households and 17,550 businesses in the region.

Energy efficiency providers could bid in, and the best projects awarded funds from the auction pool.[4] State experience with an approach like this is limited, and guidance from EPA could be very helpful to states.

DIRECT ALLOCATION OF ALLOWANCES TO ENERGY EFFICIENCY PROVIDERS

Many states have some experience with direct allocation of allowances in an emissions trading regime. Unfortunately, much of this experience is limited to programs in which allowances were handed directly to electric utilities based on the amount of fuel/energy consumed by a regulated power plant. This approach fails to take advantage of the benefits of an incentive-based regulation. Specifically, by awarding allowances to providers of energy efficiency, program administrators can simultaneously reward efficiency investments and create an incentive for utilities to reduce their pollution (as they must buy the allowances).

Administrators could allocate allowances to energy efficiency providers in any number of ways, and some approaches are preferable to others. For example, a set-aside of some portion of the allowances predetermines a limit on the incentive offered to energy efficiency providers. EPA has proposed an approach whereby a renewable-energy and energy efficiency set-aside would be used to address leakage in a mass-based plan. It is unclear how such a set-aside would address the leakage, but more importantly we fear that without additional guidance from EPA, states will perceive this option as the only way to include energy efficiency in a mass-based plan. Typically a set-aside is a small portion (3–15%) of a total allowance, which means that energy efficiency is treated as a compliance resource on the margin. This is not consistent with states' true energy efficiency potential, nor does it make economic sense. The financial incentive in a market-based regulation should drive emission reductions by the lowest-cost means within the regulated system. In the case of the Clean Power Plan the lowest-cost option states should turn to is energy efficiency.

Instead of a set-aside, EPA could recommend an approach that preferentially awards allowances to energy efficiency projects and programs. Such an approach could allocate allowances on an output basis according to kWh generated or saved. Ideally, such an approach would award allowances to zero-emission savings and generation (i.e., energy efficiency and renewables) first. The remaining allowances could be awarded to fossil-fueled electric generators in a second round of allocations.[5] We strongly encourage EPA to include these two approaches in the model rule for a mass-based plan, and we are happy to provide additional feedback or support to further explore these ideas.

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[4] Best projects could be determined by cost, but also other factors such as sound EM&V practices and the inclusion of a diversity of measures to mitigate risk and ensure that the installed measures achieve savings over the longer-term compliance period.

[5] See discussion of allocation approaches in *Simplifying Energy Efficiency for States* (December 10, 2015) available here: ajw-inc.com/wp-content/uploads/2015/12/151210-Mass-based-Allocation-White-Paper-FINAL.pdf.

Provide straightforward guidance on how states can take credit for energy efficiency programs and policies in a rate-based plan

In general, we believe that the draft EM&V Guidance is workable, but we are concerned that it is currently written for those who already understand EM&V and is therefore overly complex. We are also concerned that some of the details provided in the draft will not work well for specific types of programs (e.g., building codes and energy-savings performance contracts) without some refinement. Further, we note that there is a deeper base of experience and of pertinent protocols, methodologies, and other resources for utility ratepayer–funded energy efficiency programs than for various other important categories of energy efficiency policies, programs, and measures. To address these concerns we recommend the following steps:

- To aid understanding by those without extensive evaluation experience, we recommend preparing simple explanations and graphics to help clarify the key points. The use of lingo should also be minimized.

- To help show states exactly what they need to include in their EM&V plans and provide a template that they can modify, EPA or the US Department of Energy (DOE) should develop sample EM&V plans for some common energy efficiency policies and measures. For example, EPA or DOE could provide templates for new state building codes; residential appliance, lighting, and weatherization programs; commercial and industrial prescriptive and custom rebate programs; energy-savings performance contracts; and large-customer strategic energy management programs.

- To address several problems with the EM&V Guidance on building codes, we recommend that EPA allow states to count savings from new building codes and not prevent states from claiming savings from codes that DOE may find to be cost effective. We also suggest that rather than asking states to conduct baseline studies in order to claim savings, EPA instead define the baseline as the code in a state on the date the final rule was published. For states without statewide codes, the 2009 International Energy Conservation Code could be defined as the baseline. (More than 40 states have adopted this code.)

- To make the EM&V Guidance more workable for Energy Savings Performance Contracts (ESPCs), we recommend that EPA allow states or groups of states to conduct periodic statistical analyses of past billing data to help estimate savings. They could then compare these estimates to standard energy service company (ESCO) approaches and develop an adjustment factor that could be applied to these approaches for the following few years, until the next billing analysis is conducted.

- To make use of existing evaluation studies for measures with only a few years of savings during the compliance period, we recommend that, rather than requiring reevaluation, EPA give states the option of using earlier evaluations that may not fully follow the EM&V Guidance. This option would apply only to measures that are both installed and evaluated prior to the finalization of the EM&V Guidance, and would require the state to demonstrate that the prior evaluations are likely equivalent to or more conservative than the guidance.

- To address the fact that the model rule is too prescriptive in some respects, we urge EPA to modify it so it is less prescriptive. Requirements we see as overly prescriptive include the frequency of updating deemed savings values and specific process expectations for updating technical reference manuals (TRMs), as well as the level of statistical confidence and precision required for sampling in all cases.

ACEEE is happy to work with EPA to identify some best practices for each of these recommendations. We discuss all of these suggestions in more detail in the multigroup EM&V comments in Appendix B.

PROVIDE ACCEPTABLE MODELS FOR COMMON ENERGY EFFICIENCY PROGRAMS AND POLICIES THAT WOULD BE PRESUMPTIVELY APPROVABLE

EPA should create a process by which model templates for energy efficiency programs, measures, and policies can be preapproved or precertified for issuance of an ERC. We suggest that EPA establish a procedure by which states can submit specified details about a program, policy, or project and obtain a timely response from the agency as to whether the approach would be acceptable to include in a state plan. If a model policy or program is not approved or if EPA identifies a deficiency in the submission, EPA should provide feedback on what would need to be changed to make the submission acceptable.

In addition to this process we suggest that EPA provide several preapproved models for a variety of programs and policies so that states and stakeholders can understand what might be needed for their program or policy design, implementation, and documentation. We suggest models for at least the following categories of energy efficiency activities:

- Ratepayer-funded energy efficiency administered by utilities
- Ratepayer-funded energy efficiency administered by third parties
- Energy codes for buildings
- Privately provided energy services
- CHP
- Programs targeting low-income customers
- State appliance standards

We think it would be valuable for EPA to provide models for the following additional categories of energy efficiency activities if resources permit:

- Financing programs
- Programs targeting government buildings and institutions
- Benchmarking, rating, and/or disclosure policies
- Water and wastewater policies
- Behavior programs
- New and emerging technologies

ACEEE is happy to work with EPA to identify some best practices for each of these categories. We are also developing some best-practice models for several of the categories on this list.

Improve incentives for early investments in energy efficiency

EXPAND THE CEIP TO INCLUDE A BROADER SET OF ENERGY EFFICIENCY POLICIES AND MEASURES

Energy efficiency is a zero-emission resource, a lowest-cost path to compliance with EPA's emission goals in the Clean Power Plan, and a source of multiple benefits to ratepayers and program participants. By reducing overall electricity demand, energy efficiency reduces the capacity needed to meet demand with clean energy generation, lowering costs across the entire electric generating system. If energy efficiency cannot receive any credit toward state compliance until 2022, quite a few energy efficiency projects will be delayed to near 2022. We recommend that early investments in energy efficiency receive at least the same incentive as early investments in renewables, and we propose the following approach.

1. Provide double-credit for energy efficiency savings in low-income communities as proposed in the model rule. Energy savings in low-income communities should be a top priority and we recommend that sufficient CEIP allowances or emission rate credits (ERCs) be set aside to serve this need.

2. Expand the scope of the CEIP so that, like all renewables, all early investment in energy efficiency can receive ERCs or allowances with a federal match at a ratio of 1:1.

EXPAND THE CEIP TO REWARD EARLY ACTION BEGINNING AS SOON AS PLANS ARE SUBMITTED TO EPA

Large-scale energy savings are typically achieved over a multiyear period from investments in energy efficiency measures. The measures installed in Year 1 will accrue savings for many years, and each year that measures are installed can result in exponential growth as savings accrue and program participation expands. Experience also shows that programs typically take time to ramp up, and that while high annual savings can be sustained, it may take some time to achieve those high levels of savings.

Further, we are concerned that by delaying the start of the CEIP EPA may create an incentive to delay investment in energy efficiency until the bonus credit offered by the CEIP can be earned.

In order to ensure that early action is rewarded and that the momentum of efforts in states is not stymied, and to provide the lead time needed to truly incentivize energy efficiency programs, we recommend that early ERCs or allowances be awarded beginning shortly after a state plan is finalized and no later than 2018.

PROVIDE ADDITIONAL GUIDANCE ON WHAT PROJECTS AND PROGRAMS CAN QUALIFY FOR DOUBLE CREDIT UNDER THE CEIP

EPA should require that energy efficiency measures eligible for the 2:1 award of allowances from the EPA's CEIP reserve pool should be limited to those that directly result in energy savings for low-income households (e.g., residential energy efficiency) or those that result in energy savings for entities that serve low-income communities such as a commercial, industrial, and public facility (e.g., energy efficiency projects for municipal buildings or community development organizations). States should be required to set some standard of community benefit for nonresidential energy efficiency projects. States should have flexibility in how they define community benefit based on specific economic and social characteristics of each

community. Nonresidential projects that will benefit low-income communities may be implemented in public or private nonprofit organizations that serve the community. This includes government agencies, public schools, hospitals, community colleges, and community-based organizations that deliver or assist in the delivery of social services. Private companies within low-income communities may also implement energy efficiency projects as long as a state-approved strategy is in place to demonstrate that benefits from energy savings will accrue to the community.

We encourage EPA to work with and develop resources for states to ensure that organizations and companies in low-income communities benefiting from energy efficiency projects are reinvesting in the communities they serve. This may involve mechanisms for facilitating additional projects in the community and instituting labor standards that make for a fair and inclusive workforce. Jobs and economic development spurred by these projects are critical in low-income communities that suffer from a lack of clean energy investments, especially in those communities facing potential job loss from implementation of the rule.

To facilitate the deployment of low-income energy efficiency, we recommend that EPA put forth a multi-pronged definition of a "low-income community" that clarifies for states, localities, and implementers how to identify communities and households that are eligible for energy efficiency projects under the CEIP. While we applaud the EPA's effort to target investments in overburdened low-income communities, the definition should recognize low-income communities and low-income individuals. The CEIP should be designed to benefit low-income communities in urban and rural areas, as well as low-income individuals, i.e., homeowners or renters living in single-family homes and multifamily buildings in a variety of neighborhoods. We also recommend that EPA put forth a definition that is consistent with other federal, state, and localities' established practices for the delivery of social services and resources to benefit low-income communities. To this end, we support the adoption of the US Department of Housing and Urban Development (HUD) definition for "low to moderate income" that has a specific programmatic context within the Community Development Block Grant (CDBG) program. The CDBG program administered by HUD provides grants to states, local governments, and organizations to run a variety of housing and community/economic development projects that benefit low- to moderate-income citizens. Under this program, the timely distribution of funds is critical, and therefore many states (grantees) and localities and community development organizations (sub-grantees) have a system in place for identifying eligible households and projects within eligible geographic areas. We propose a three-part definition of "low-income community" for the CEIP. This definition mirrors the practices for distributing and verifying eligible households and projects under the CDBG program.

Under the CEIP, eligible energy efficiency projects and measures should include those that serve:

Areas where 51% of the population's income falls below 80% of area median income

This geographic definition can be applied for crediting all energy efficiency projects implemented within a defined community. In order to qualify as an energy efficiency project serving a low-income community, the measures must be implemented in an area where at least 51% of residents are below 80% of the area median income. Both residential and nonresidential projects implemented within this defined community should count under the CEIP. For

example, in addition to residential energy efficiency, an efficiency project would also count if it results in a benefit to low-income residents by delivering energy efficiency to a public institution, organization, or company that serves the community in the defined geographic area. In order to identify eligible areas for projects, a state may use HUD or Census data on "low and moderate income areas" (i.e., percentage of low-income residents by census tract or zip code).

Households with incomes below 80% of area median income

In this case, "low-income" is defined as an annual household income that does not exceed 80% of area median income, as adjusted by household size. A household is defined as all persons occupying the same housing unit, regardless of their relationship to each other. The occupants could consist of a single family, two or more families living together, or any other group of related or unrelated persons who share living arrangements. Currently, the 80% of area median income figure is determined by HUD and is based on a four-person family and is adjusted upward or downward for larger or smaller families. HUD updates this figure annually. Under this household definition, residential energy efficiency measures would be eligible for credit under the CEIP if they are implemented in households with income below 80% of area median income. Household income can be verified using pay stubs or IRS documentation of annual gross income. Additionally, projects or measures that serve households receiving federal housing assistance, Supplemental Security Income (SSI), or Temporary Assistance for Needy Families (TANF) should automatically be eligible for credit under the CEIP without additional income certification. For multifamily units, 51% of all units within the multifamily building where measures are being installed must be occupied by households that fall below 80% of the area median income. For these properties, verification may consist of written documentation from each landlord or developer indicating the total number of dwelling units in each multi-unit structure that receive government housing assistance and/or the number of those units that are occupied by low-income households. Buildings where 51% or more of households receive federal housing assistance should be deemed automatically eligible for the CEIP without the need for additional income certification. Renters who receive federal housing assistance must already demonstrate that their income is equal to or less than 80% area median income.

Households or areas that are deemed low-income by an existing state or local definition of low-income

While area median income information is produced for small geographies across the country, these criteria are not always used to administer programs that serve low-income communities. We recommend avoiding restrictive definitions that may limit the extent to which states and energy efficiency implementers would participate in the CEIP. Under the CEIP, states and efficiency providers (such as utilities or other implementers) should have the ability to apply their own commonly used definitions of low-income in cases where it is equally or more restrictive than the low-income definition proposed above. An alternate eligibility threshold chosen by a state must nevertheless be consistent with a definition of "low-income households" used by existing state-administered or state-approved programs. Where this is the case, the criteria used should be submitted to EPA for approval. However EPA could proactively approve some definitions that will likely be adopted by states and localities. For example, the majority of weatherization programs require that participating households' annual gross income from all income sources be at or below 200% of the Federal Poverty Level for each

family size. This should be an acceptable standard with which to define low-income under the CEIP.

Additionally, to gain credit under the CEIP, states might wish to target resources for energy efficiency projects aimed at vulnerable communities—those that face a number of economic and social hardships. Under the CDBG programs, states and localities are required to conduct a needs assessment that helps each community identify and define its individual needs as well as its strengths and assets. If states want to facilitate low-income energy efficiency, this is a productive first step for identifying how to target resources effectively. These areas may experience higher unemployment, lower income levels, and other such economic and demographic indicators that demonstrate a higher level of need than surrounding areas. The analysis would also take into account existing conditions such as housing stock, public infrastructure, and community facilities.

States should also be encouraged to look at a mix of environmental and demographic indicators when prioritizing credit allocation under the CEIP. EPA should provide increased training opportunities and resources to encourage states' use of EJSCREEN, the environmental justice mapping and screening tool that provides EPA and states with a nationally consistent dataset and approach for combining environmental and demographic indicators. Regardless of the geotargeting approach, a typical needs assessment or environmental screening should include:

- Current data and projections concerning demographics (e.g., households, income levels, unemployment, and so on) as well as housing supply and demand
- Data on rents and housing prices in specific neighborhoods within the jurisdiction
- Key indicators on environmental and human health conditions of minority and low-income population within a specified geography
- An analysis of the health of the local economy
- An assessment of the state of the jurisdiction's infrastructure
- An analysis of which neighborhoods have the most acute community development needs
- A general review of the feasibility and need for certain types of energy efficiency projects (including energy efficiency retrofits of public buildings like municipality offices and schools) in specific neighborhoods

PROVIDE GUIDANCE AND MODEL LANGUAGE FOR HOW STATES CAN SET ASIDE FUTURE PORTIONS OF THEIR ALLOWANCES TO AWARD A GREATER PORTION FOR EARLY ACTION

The model rule proposes that states could set aside some portion of their mass-based allowances from future years to be awarded for early action. We request that EPA provide additional detail as to how a state might structure its plan to administer this early allocation starting after the submittal of a final state plan. Further, we request that EPA provide states with guidance for consolidating the program administration of this early action effort with the administration of a state's CEIP participation. We also request guidance from EPA on how states that opt for rate-based plans can further incent early emission reductions.

Improve certainty and incentives for investments in CHP

REVISE THE ACCOUNTING APPROACH IN THE PROPOSED MODEL RULE FOR A RATE-BASED PLAN TO MORE ACCURATELY REFLECT THE SAVINGS DELIVERED BY CHP

We support the inclusion of CHP as an eligible measure that can produce ERCs in both a rate-based federal plan and the model rule. EPA seeks comment on the proposed requirements for the issuance of ERCs for CHP. While we agree with the accounting considerations outlined in the final rule (e.g., calculating a CHP unit's incremental carbon dioxide emissions rate compared to a reference carbon dioxide emissions rate), we are concerned that the proposed approach outlined in the model rule significantly undervalues the contribution that CHP can make toward achieving the goals of the Clean Power Plan.

EPA's proposed reference rate for CHP systems suffers from two key flaws. First, it compares the CHP output to natural gas generation rather than the generation that is most likely to be avoided due to CHP deployment. Second, it compares the CHP system to emission target rates rather than real-time emission rates. While EPA seeks to encourage additional deployment of CHP, this approach undervalues its benefits and in so doing removes virtually any incentive for considering it as a compliance option.

We propose three alternative approaches for EPA to consider. All three approaches would more accurately account for the zero-emission MWh generated from CHP and increase the value of ERCs for CHP over EPA's proposed approach. EPA could give states the option of using one of the first two approaches below, or suggest that all states use the third approach:

1. Use the average affected EGU emission rate for the eGRID subregion in which the CHP unit is located as the reference rate.
2. Use the average affected EGU emission rate for the state in which the CHP unit is located as the reference rate.
3. Use a single national average affected EGU emission rate.

We describe these options in detail in Appendix A. We believe that option 1 (i.e., using eGRID subregion emission rates as the reference rate) is the preferable approach and urge EPA to adopt it in both a rate-based federal plan and the rate-based model trading rule.

STRENGTHEN THE TREATMENT OF CHP IN A MASS-BASED PLAN BY CLARIFYING AND OUTLINING OPTIONS FOR INCENTIVIZING CHP

EPA seeks comment on whether CHP should receive allowances under the mass-based model rule and federal plan. We recommend that EPA outline the methods states should consider to help them incentivize CHP in both the mass-based federal plan and the model rule. The options outlined above in the section titled "Provide guidance and models outlining methods states could use to incentivize energy efficiency in a mass-based plan" should also apply to CHP, with two additions:

- When directly allocating allowances to CHP, using a set-aside of some portion of allowances predetermines a limit on the incentive CHP can receive. In the model rule, we recommend that the set-aside be sized based on the potential for CHP in a given state.

- CHP should be included as an eligible measure for allowance set-asides designed to address leakage from new sources in the mass-based model rule.

Conclusions

We are excited and optimistic that end-use energy efficiency has the potential to play such an important role in state compliance plans. We believe that EPA's model rule and federal plan will send an important signal to states about how energy efficiency fits into plans. In fact EPA has the ability to help states overcome long-standing barriers to cost-effective investments and technologies, or it can hinder those efforts by making energy efficiency too confusing, uncertain, or burdensome for states to consider. The recommendations included here are the steps we believe are needed to set states on the better path.

Appendix A. Treatment of CHP in a Rate-Based Rule

EPA seeks comment on whether combined heat and power (CHP) should be identified as an eligible measure under the federal plan.[1] We wholeheartedly support inclusion of CHP as an eligible measure that can produce emission rate credits (ERCs) in both a rate-based federal plan and a rate-based model trading rule. EPA further seeks comment on the proposed requirements for the issuance of ERCs for CHP.[2] We believe that the proposed approach outlined in the model rate-based trading rule significantly undervalues the contribution that CHP can make toward achieving the goals of the Clean Power Plan, and suggest an alternative approach below.

EXPRESSLY INCLUDE CHP AND WHP AS ELIGIBLE MEASURES THAT CAN PRODUCE ERCS IN BOTH THE MODEL RULE AND FEDERAL PLAN

ERCs are awarded to resources that produce electricity more cleanly than the standard set by the target emission rate. Nonrenewable resources can earn ERCs if they "deliver energy to or save electricity on, the electric grid."[3] Notably, the final rule's emission guidelines (EGs) explicitly identify CHP and waste heat to power (WHP) as resources that qualify for the issuance of ERCs in rate-based state plans.[4] Accordingly, CHP and WHP should likewise be included as eligible measures in the rate-based model rule, and EPA should include CHP and WHP ERCs should it develop a rate-based federal plan.

States will undoubtedly look to the model rule as a starting point in designing their own compliance plans. By providing for ERCs from non-affected CHP and WHP units in the model rule, EPA can send an important signal to the states about the appropriate treatment of these resources under a rate-based approach. ERCs are intended to incentivize activities that reduce CO_2 emissions from power plants. EPA should seek to promote greater investment in CHP and WHP because, as explained above, these technologies have additional benefits when compared to other compliance options, including cost effectively reducing CO_2 emissions and enhancing electric reliability. Moreover the remaining potential for CHP and WHP is significant in every state.

We acknowledge that EPA seeks to simplify and streamline the implementation of a federal plan, as EPA will need to administer a federal plan on behalf of a state. Including energy efficiency and CHP in the federal plan will help ensure that it provides for the lowest-cost

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[1] 80 Fed. Reg. 64966, at 64994 (October 23, 2015), "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" ("The agency . . . requests comment on the inclusion of CHP as an eligible measure under the federal plan.")

[2] *Id.* ("[T]he agency has provided detailed requirements for the issuance of ERCs for CHP, and we request comment on these requirements for inclusion in the federal plan.")

[3] 80 Fed. Reg. 64662, at 64950.

[4] *Id.* (§60.5800(4)(v)) ("What other resources qualify for issuance of ERCs?") (listing "A non-affected combined heat and power unit, including waste heat power").

emission-reduction options. EPA has already proposed detailed requirements and an accounting mechanism for CHP and WHP in the rate-based model rule, both of which are simple to apply. EPA can efficiently conduct evaluation, measurement, and verification for CHP in a federal plan using the same approach, although we ask EPA to address certain flaws as described below.

MODIFY THE PROPOSED ACCOUNTING APPROACH FOR NON-AFFECTED CHP, WHICH UNDERVALUES ITS EMISSIONS BENEFITS

We are grateful that the final rule recognizes that non-affected CHP and WHP units can generate ERCs. We further appreciate that EPA acknowledges the need to provide technical assistance to help states include CHP in their plans, and that the rule seeks to provide some of this initial guidance.[5] The proposed model rule for a rate-based emission-trading program includes an accounting method for determining the ERCs from non-affected CHP units, which EPA suggests could be a "presumptively approvable accounting approach."[6] EPA seeks comment on the proposed accounting method.[7] We believe that the proposed approach significantly undervalues CHP's emission benefits and thus fails to create an adequate incentive for increasing investment in CHP. Our comments suggest an alternative approach that would more accurately account for the CO_2-free MWhs generated by CHP, while still creating an appropriate incentive for new projects.

As EPA recognizes in the final rule, the accounting approach must both "take into account the fact that a non-affected CHP unit is a fossil fuel-fired emission source, as well as the fact that the incremental CO_2 emissions related to electrical generation from a non-affected CHP unit are typically very low."[8] We concur with EPA that it is appropriate to net out the incremental emissions associated with CHP units before ascribing ERCs to the output. The proposed methodology, however, is flawed because it fails to adequately account for what electricity from affected units is most likely to be reduced by generation from non-affected CHP systems.

EPA lays out its approach for determining ERCs from non-affected CHP units in the final rule:

> [A] non-affected CHP unit's electrical MWh output that can be used to adjust the reported CO_2 emission rate of an affected EGU should be prorated based on the CO_2 emission rate of the electrical output associated with the CHP unit (a CHP unit's "incremental CO_2 emission rate") compared to a *reference CO_2 emission rate*. This "incremental CO_2 emission rate" related to the electric generation from the

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[5] *Id.* at 64705 ("In particular, the states requested training on how to use programs such as combined heat and power . . . to reduce carbon emissions. The EPA will continue to work with states to tailor training activities to their needs.")

[6] *Id.* at 64902.

[7] *Id.* ("[T]he agency has provided detailed requirements for the issuance of ERCs for CHP, and we request comment on these requirements for inclusion in the federal plan.")

[8] *Id.*

> CHP unit would be relative to the *applicable CO_2 emission rate for affected EGUs* in the state and would be limited to a value between 0 and 1.[9]

The final rule does not define the phrases "reference CO_2 emission rate" and "applicable CO_2 emission rate for affected EGUs." Instead these terms are defined in the model rule and thus remain open to public comment.

The proposed rate-based model rule provides that a non-affected CHP unit's electrical output be prorated as follows:

*Prorated MWh = (1 – (Incremental CHP electrical emission rate / Applicable affected EGU emission rate standard)) * CHP MWh output*[10]

The approach EPA prescribes in the final rule for determining the "incremental CHP emission rate" is based on the *avoided emissions approach*. We support the use of this approach and believe that it appropriately accounts for the modest increase in on-site emissions associated with a CHP system. Under this approach the incremental emissions rate is calculated by subtracting from the measured emissions of the CHP system those emissions that would have been produced on-site to provide the same thermal output without the CHP system (i.e., emissions that would have come from a "counterfactual boiler" – the boiler that is now not needed due to the installation of CHP). These incremental emissions are then divided by the net electric output of the CHP system to calculate the incremental emission rate. Thus:

Incremental emission rate = (Annual CHP CO_2 emissions – Annual displaced boiler CO_2 emissions) / (Annual CHP electricity output)

The incremental emission rate is then inserted into the previous formula to determine the prorated output (MWh) for a CHP system. That, in turn, determines the number of ERCs to be awarded to a CHP installation.

As noted above, the final rule does not define the term "reference CO_2 emission rate" or "applicable CO_2 emission rate for affected EGUs," which is used in the denominator of the proration formula. However the proposed model rule outlines a detailed approach for determining CHP ERCs under a rate-based plan and defines the term "reference CO_2 emission rate" in a footnote as "the applicable CO_2 emission rate standard . . . in Table 6 of this preamble."[11] EPA's table 6 follows.

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[9] *Id.* (emphasis added).

[10] 80 Fed. Reg. 64966, at 64996.

[11] *Id.* at n. 64.

Table 6. Glide Path Interim Performance Rates (Adjusted Output-Weighted-Average Pounds of CO_2 Per Net MWh From All Affected Fossil Fuel-Fired EGUs)

Technology	2022–2024 Compliance Rate	2025–2027 Compliance Rate	2028–2029 Compliance Rate	Final Rate
SGU or IGCC	1,671	1,500	1,380	1,305
Stationary combustion turbine	877	817	784	771

It is unclear from EPA's table 6 whether the "applicable CO_2 emission rate" is intended to refer to the interim glide path performance rates or the final targets for SGU or stationary combustion turbines. We understand, however, that the "reference CO_2 emission rate" for natural gas CHP is intended to be the performance rate for stationary combustion turbines in this table (i.e., 817 lbs/MWh in 2025–2027).[12] While we support EPA's adoption of the avoided emissions approach to determine the incremental emissions rate, we are concerned that the applicable reference CO_2 emission rate proposed in the model rule significantly undervalues the emissions benefits of a CHP system and will, as a practical matter, eliminate CHP as a potential compliance option.

To illustrate the impact of EPA's proposed approach, table B1 calculates the incremental emissions rate for two typical natural gas CHP systems, a 1-MW gas engine and a 7-MW gas turbine. As shown, the incremental CO_2 emissions rate for these systems, calculated using the avoided emissions approach described above, ranges from 519 to 665 lbs/MWh.

Table B1. Incremental CO_2 emissions for typical CHP units

CHP system type	1 MW recip. engine	7 MW gas turbine
Net electrical efficiency	36.8%	28.9%
Total CHP efficiency	78.5%	70.4%
Incremental CO_2 emissions rate (lbs/MWh)	519	665

Based on typical performance for a 1.12 MW reciprocating engine and a 7.04 MW gas turbine from US EPA, 2015, "Catalog of CHP Technologies," tables 2-2 and 3-2. www.epa.gov/sites/production/files/2015-07/documents/catalog_of_chp_technologies.pdf.

As shown in table B2 below, applying the glide path interim performance rates for stationary combustion turbines (i.e., 817 lbs/MWh in 2025–2027) to the incremental CO_2 emissions of typical systems yields a prorated output eligible for ERCs ranging from 18.6% to 36.4% of the

[12] Personal communication, Jennifer Kefer et al. with EPA staff (including Neeharika Naik-Dhungel, Christopher Sherry, Christian Fellner, Matt Clouse), September 25, 2015.

CHP system output.[13] This approach undervalues the actual CO_2 emissions benefits of CHP, and it also places CHP at a significant disadvantage compared to energy efficiency and renewables, which would receive ERCs for their full electrical output.

Table B2. Percentage of CHP output credited using EPA's proposed approach

CHP system type	1 MW recip. engine	7 MW gas turbine
Incremental CO_2 emissions rate (lbs/MWh)	519	665
2025–2027 compliance rate for stationary combustion turbine (table 6)	817	817
Percentage of CHP output (MWh) credited	36.4%	18.6%

We believe EPA has chosen to compare CHP to the natural gas target rate because it has characterized CHP as a "low-emitting electric generation resource" and believes it must therefore treat CHP in the same manner that it treats all other "low-emitting electric generation resources."[14] The final rule allows affected EGUs that perform better than the emission standard to generate ERCs, and we agree that ERCs for such units should be calculated based on the *specific emission rate target for those affected units*. However, unlike high-performing affected natural gas generating units, non-affected CHP units do not have specific emissions targets and therefore do not need to be compared to a specific emission standard. Instead the emissions benefits from CHP can be converted to an equivalent amount of zero-emission MWh generated by using a "reference emissions rate" that reflects the emissions rate of affected EGUs being displaced by non-affected CHP. This is similar to the way that MWhs of savings from demand-side efficiency result from reductions in generation from affected units. In fact CHP is the only non-affected low-emitting generation resource identified in the rule. As a result, concerns about consistent treatment are unwarranted.

EPA's proposed "reference rate" for CHP systems suffers from two key flaws:

- It compares the CHP output to natural gas generation, rather than to the generation that is most likely avoided due to CHP deployment.
- It compares the CHP output to emission target rates, rather than to real-time emissions rates.

We do not believe it is appropriate to base the proration of the electrical output from a natural gas CHP system on the compliance goals for stationary combustion turbines. Instead we believe that EPA should define the reference rate using actual emissions data from affected EGUs from the previous calendar year. We propose three alternative approaches for EPA to consider. All

[13] While EPA provided no specific guidance, we assume that the compliance rate to be used in the proration calculation is the applicable rate for the time period in which the ERCs are being generated. We used the 2025–2027 interim performance rates in this calculation as a general illustration of the impact of the proposed approach on CHP ERCs.

[14] 80 Fed. Reg. 64662, at 64902 ("CHP units are low-emitting electric generating resources").

three of these approaches would more accurately account for the actual emission reductions from CHP and increase the value of ERCs for CHP over EPA's proposed approach. EPA could give states the option of using one of the first two approaches below, or suggest that all states use the third approach:

- The average affected EGU emission rate for the eGRID subregion in which the CHP project is located
- The average affected EGU emission rate for each state
- A single national-average affected EGU emission rate[15]

Each of these options is described in detail below. Table B3 summarizes the reference rates and percentage of credited CHP output under each option.

Options 1 and 2. Use the average affected EGU emission rate for the eGRID subregion or state in which the CHP project is located

The data on actual affected EGU emission rates will be readily available during the compliance period, as states must submit emissions data to EPA as part of their Clean Power Plan compliance. Under this approach EPA would update the reference rate each year, sorting emissions (lbs of CO_2) and output (MWh) from all EGUs into the appropriate eGRID subregion or state.[16]

During the Clean Power Plan compliance periods, owners of affected EGUs may adjust the dispatch orders of their generation assets to achieve targets, varying the consumption of coal and natural gas. It is fair to assume that CHP would offset emissions from a mix of fossil resources. Using a reference rate based on the average affected EGU emission rates for the state or regional electricity grid is a reasonable way to estimate the emissions benefits of CHP. CHP would offset fossil-based generation; it would not offset baseload nuclear or hydropower generation, nor would it offset wind or solar resources.

Using the eGRID subregions for the average emission rates (Option 1) would provide a better estimation of emissions impacts than using state averages (Option 2), because there are significant exports and imports of electricity across state borders. The eGRID subregions were defined to approximate regional power pools, for which exports and imports are minimal.[17]

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[15] Another option for obtaining a single national value for the reference rate would be to use the performance targets for SGU or IGCC units provided in EPA's table 6 (i.e., 1,500 lbs/MWh in 2025–2027) (80 Fed. Reg. 64966 at 64996, n. 64). This value would be similar to that of our suggested option 3, but probably slightly lower. While we think this approach is overly simplistic and suffers from the flaw of comparing CHP to a target rate, it is likely more accurate to assume that CHP units are displacing coal rather than natural gas (as EPA assumes in the proposed approach).

[16] It should be relatively easy for EPA to sort the affected EGU CO_2 emissions and output into the eGRID subregions in order to calculate these average emission rates.

[17] EPA CHP Partnership, February 2015, "Fuel and Carbon Dioxide Emissions Savings Calculation Methodology for Combined Heat and Power Systems" at 25. www.epa.gov/sites/production/files/2015-07/documents/fuel_and_carbon_dioxide_emissions_savings_calculation_methodology_for_combined_heat_and_power_systems.pdf.

Some states may prefer to use the state-average affected EGU emissions rate, especially states that include parts of several eGRID subregions. While we believe eGRID subregion–level data more accurately reflect the potential emissions impact of CHP projects, the state-average EGU emissions rates would provide a reasonable proxy for the emissions savings from reduced generation by affected EGUs as a result of CHP projects. EPA may want to allow states this flexibility.

Option 3. Use a uniform national reference rate

EPA could also calculate a national reference rate (Option 3). The advantage of using an eGRID subregion reference rate (Option 1) or state-specific reference rate (Option 2) is that it would create a greater incentive for CHP deployment in states/regions where CHP would have the largest benefits (i.e., CHP projects in states or regions with a higher reference rate would receive more ERCs). The disadvantage of this approach is that credited CHP output will vary between states and regions depending on their fuel mixes, potentially creating greater incentives for CHP in some states than in others. By comparison, applying a national reference rate (Option 3) would have the advantage of providing a single reference rate for all states, creating a simplified approach and leveling the playing field for CHP. It would also simplify the process of annually updating the reference rate(s). However a uniform national rate would undervalue the CO_2 emissions benefits of CHP in states or regions with a more coal-intensive resource mix, while overvaluing these benefits in less carbon-intensive states/regions.

Using any of these options has several advantages over EPA's current approach. First, using these reference rates would allow the calculated ERCs to best reflect the actual emissions-free MWh generated by a CHP system. In the case of Option 3, this would at least be true on a national-average basis, even if actual benefits are somewhat over- or underestimated in a particular state or region. Second, using the EGU emission rates would be consistent with the approach recommended by the EPA CHP Partnership for calculating avoided CO_2 emissions due to CHP.[18] Third, as shown in table B3, all three of these reference rates would allow a much larger portion of CHP electricity output to be counted as ERCs, thus assigning CHP projects greater incentives that are more commensurate with their actual emissions benefits.

[18] The EPA CHP Partnership recommends using the eGRID subregion "all-fossil" CO_2 emission rates to approximate the types of generation that are most likely to be replaced by customer-sited CHP. Using the actual emissions from regulated EGUs would be very similar to using the eGRID all-fossil emissions rates, except that the data would be more current than eGRID data (which are not updated annually) and would exclude any fossil generation units smaller than 25 MW. Using the eGRID subregional averages would be the option most consistent with the EPA CHP Partnership's methodology (and the most accurate).

Table B3. Percentage of CHP output credited using alternative reference rates

Approach for reference emissions rate	Reference emissions rate (lbs CO_2/MWh)	Percentage of CHP output (MWh) credited	
		1-MW recip. engine, incremental emission rate of 519 lbs CO_2/MWh	7-MW gas turbine, incremental emission rate of 665 lbs CO_2/MWh
EPA's proposed approach: interim compliance goal for gas turbines	817[1]	36.4%	18.6%
Option 1. 2025 eGRID subregion EGU emission rate	~980–1,937[2]	47.0%–73.2%	32.1%–65.7%
Option 2. State 2025 EGU emission rate	~883–2,155[3]	41.2%–75.9%	24.7%–69.1%
Option 3. National-average 2025 EGU emission rate	~1,570[4]	66.9%	57.6%

1. 80 Fed. Reg. 64966, at 64990 (table 6).
2. This range of 980–1,937 lbs CO_2/MWh is based on several assumptions. We started with the 2012 eGRID subregional fossil emission factors, which range from 980 lbs/MWh for the NPCC New England subregion to 2,152 lbs/MWh for the MRO West subregion. As discussed above these factors are a good approximation of subregional EGU CO_2 emission rates (using data available now). Then we assumed that by 2025 the lowest subregional fossil EGU emission rate would stay the same, and the higher value (2,152 lbs/MWh) would be reduced by about 10%, to 1,937 lbs/MWh. These seem like reasonable assumptions for emission reductions from EGUs between now and 2025; EPA may also change these assumptions based on its own projections.
3. This range of 883–2,155 lbs CO_2/MWh is based on several assumptions. We started with the 2012 eGRID state all-fossil emission factors, which range from 883 lbs/MWh for Connecticut to 2,395 lbs/MWh for Montana. These factors are a good approximation of the actual state EGU CO_2 emission rates. Then we assumed that by 2025, the lowest state EGU emission rate would stay the same and the higher value (2,395 lbs/MWh) would be reduced by about 10%. Again, EPA can modify these assumptions based on its own projections.
4. Calculations assume that by 2025 the 2012 eGRID national-average all-fossil emission rate of 1,652 lbs CO_2/MWh would be reduced by about 5%.

As table B3 demonstrates, these options allow a significantly greater percentage of CHP output to be credited as ERCs than EPA's proposed approach. Options 1 and 2 are somewhat more complicated, but would create a greater incentive for CHP deployment in the states or regions where it would have the greatest benefit. Option 3 would be simple for EPA to calculate each year during the compliance period and would allow a level playing field for CHP in all states. Accordingly, we urge EPA to define the reference rate for CHP based on actual EGU emissions, using any of these three options.

Appendix B. Consensus Comments on Evaluation, Measurement, and Verification

January 21, 2016

VIA EMAIL
Environmental Protection Agency
Attn: Docket ID No. EPA-HQ-OAR-2015-0199
A-and-R-Docket@epa.gov

Re: Docket ID No. EPA-HQ-OAR-2015-0199 - Joint Energy Efficiency ('EE') Stakeholder Comments on EPA's Proposed Federal Plan Requirements and Model Trading Rules with regard to EM&V provisions for Demand-side Energy Efficiency

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Dear Administrator McCarthy:

These joint comments are provided to the U.S. Environmental Protection Agency (EPA) in response to its request for comments on the proposed Federal Plan requirements and Model Trading Rules (MTR), with regard to EM&V for energy efficiency (EE). These comments are supported by the following signatories, herein after referred to as the "Joint EE Stakeholders."[1]

Acadia Center
American Council for an Energy Efficiency Economy
E4theFuture
Midwest Energy Efficiency Alliance
Natural Resources Defense Council
Northeast Energy Efficiency Partnerships, Inc.
Northwest Energy Efficiency Alliance
Southeast Energy Efficiency Alliance
South-central Partnership for Energy Efficiency as a Resource
Southern Alliance for Clean Energy
Vermont Energy Investment Corporation

The signatories also separately submit these comments in response to EPA's *Invitation for Public Comment on the Draft EM&V Guidance*, as they pertain largely to the draft EM&V guidance. Questions regarding these comments should be directed to: Julie Michals at NEEP (jmichals@NEEP.org) or Steven Nadel at ACEEE (snadel@aceee.org).

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[1] These comments reflect the position of the signatories and do not necessarily represent the positions of the signatories' members, sponsors, or board members.

INTRODUCTION

We begin with providing general comments on both the MTR and Guidance, followed by comments addressing the appropriate application of the MTR and Guidance to project or program implementation. We then respond directly to EPA's list of questions in its Guidance seeking feedback on a range of issues. Comments are also provided on several specific sections of the MTR and Guidance with a focus on Reporting requirements. Finally, we provide comments on EE and EM&V in the Federal Plan, and EM&V for the Clean Energy Incentive Program (CEIP).

A. General Comments on EM&V
B. Application of Model Trading Rules and EM&V Guidance Relative to Timing of Installations
C. Comments in response to EPA's questions in its EM&V Guidance
D. Comments on specific sections of the EM&V Guidance (and Model Trading Rules):
    1. Reporting timeframes and considerations
    2. Savings verification
    3. Transmission and distribution (T&D) savings adders
E. EE and EM&V in the Federal Plan
F. EM&V for Clean Energy Incentive Program (CEIP)

A. General Comments on EM&V

These comments represent the views and recommendations of EE practitioners who have a diverse breadth of experience in each region of the United States. We recognize that guidance cannot cover every single issue. That said, our main interest is to ensure that EE be a core component of a cost-effective means to achieve the particular state goals of the Clean Power Plan, and that EE can enable states to achieve such trajectory in the same or sooner timeframe as that required by the Clean Power Plan.

We support EPA's efforts to develop guidance and presumptively approvable state plan provisions for the Evaluation Measurement and Verification (EM&V) of demand-side EE to ensure savings estimates represent real CO2 emission reductions, balance accuracy and rigor with evaluation cost and ease of implementation. Transparency and consistency are key to balancing accuracy and cost. EPA, working with other agencies and EM&V experts, should support ongoing efforts to further develop and refine EM&V methodologies and tracking systems that states can cost-effectively employ to ensure real CO2 emission reductions. Our comments discuss ways in which the regulation and guidance can better align with this goal, meet CPP requirements, and help achieve a reasonable balance between accuracy and cost.

We believe that the draft Guidance is reasonable and appropriate for the most part, and effectively builds upon common EM&V practices currently used in the industry. We are,

however, concerned that the Guidance is currently written for those who understand EM&V, and may be unnecessarily complicated for air regulators and others who are new to or have relatively little experience with EE EM&V. Further, we note that there is a deeper base of experience and of pertinent protocols, methodologies, and other resources for utility consumer or ratepayer-funded EE programs than for various other important categories of EE policies, program, and measures. Smaller utilities, municipal utilities and coops, and community based programs may have a hard time conducting EM&V (relative to the size of their programs) to the level of rigor that is suggested for larger investor-owned utilities.

We request that EPA adopt as a guiding principle that EM&V requirements for EE, while maintaining adequate rigor, should be practical and readily achievable by the full range of EE services and investments covered by states and utilities. This principle should recognize that the level of resources devoted to EM&V, and the stringency of EM&V requirements, should be commensurate with the magnitude of resulting CO_2 reductions, relative to other measures, and the ability to reduce uncertainty with additional (or more complex or stringent) EM&V. EPA should provide additional guidance for the practical application of EM&V to these smaller-sized programs and portfolios. We support EPA's emphasis on the importance of developing and using robust state TRMs (Section 2.4.1 at page 16 of the EM&V Guidance), as a source for calculating savings, where the assumptions are available for all EE providers in the state, and are informed by a transparent and comprehensive TRM development and updating process. Simultaneously, we recognize that many states and utilities – in particular smaller utilities – do not currently utilize TRMs.

To aid understanding of EM&V by those without extensive evaluation experience or resources, we recommend that:

- Simple explanations and graphics in the EM&V guidance be prepared to help explain key points. In addition, use of evaluation jargon and abbreviations should be minimized.
- EPA provide sample EM&V plans for some common EE measures or technologies, program delivery mechanisms and broader policies to help show states exactly what they need to include in their EM&V plans and provide a template that states could modify. For example, templates could be provided for new state building codes, residential appliance, lighting rebate or upstream lighting program and weatherization programs, commercial and industrial prescriptive and custom rebate programs, and energy savings performance contracts that deliver similar commercial and industrial measures.
- EPA provide a sample M&V reporting template, as discussed further in the comments.

We also request that the EPA accept EM&V that has been established by the federal government for other existing programs such as the Low Income Weatherization Assistance Program and deem these approaches to EM&V as presumptively approvable.[2] Excluding such tools would

[2] In the case of the Weatherization Assistance Program, we assume that DOE will adopt some changes to their procedures to better address audit accuracy. DOE began this process through a recent Request for Information. See http://www.vnf.com/rfi-energy-savings-prediction-methods-for-residential-energy.

require states to unnecessarily demonstrate additional EM&V compliance requirements, despite the widespread use of these federally-sponsored products.

We provide additional specific examples and recommendations on where improvements can be made to clarify and make the Guidance more useful for users.

We applaud EPA for responding to stakeholder requests for flexibility on the range of EM&V methods for determining savings, by offering EE providers the option to select from three broad categories of EM&V methods that are commonly used and accepted industry practice. We offer specific recommendations on where clarity of the EM&V methods, their use and application, would be helpful.

We believe some flexibility on application of EM&V in the MTR and Guidance should be provided for measures evaluated prior to publication of the final Guidance, as discussed below.

Finally, we are concerned that the MTR is too prescriptive in some respects, in particular with regard to the frequency of updating deemed savings values, frequency of measure persistence studies, and the level of statistical confidence and precision required for sampling. Our concerns in these areas are that the provisions in the MTR and/or Guidance *should not apply in all cases*. Also, we note concern with specific process expectations for updating technical reference manuals (TRMs). These comments make recommendations for where EPA should either modify the MTR so that it is less prescriptive by moving some material to the EM&V guidance, and/or to modify the requirement in the MTR, as discussed herein.

B. Application of the EM&V Guidance Relative to Timing of Installations

Under the Clean Power Plan Final Rule ('CPP or Emissions Guidelines'), EE measures installed after Dec. 31, 2012 that are still saving energy in 2022 and beyond, can earn credit under the CPP. For measures installed after the Guidance is finalized, it is entirely appropriate to suggest that this Guidance be followed. However, for measures that are installed *and* evaluated prior to the finalization of the EM&V guidance, we recommend that EPA provide an option to use earlier evaluations, provided they can demonstrate that these old evaluations are likely equivalent to or more conservative than following the Guidance, rather than requiring that these measures be re-evaluated. Further, if a state finds that these old evaluations are not equivalent, EPA could still accept the results but with some discounting of savings as discussed below (measures not evaluated prior to publication of the final guidance should follow the final EM&V guidance). In our view, such a treatment is consistent with what is specified in the final rule.

Assuming the EM&V guidance is finalized in 2016, by 2022, measures installed from 2013-2016 are likely to be providing a minority of savings in 2022, and a very small share of savings in 2030. These savings are likely to be modest enough that savings evaluation already carried out can be used, with caveats suggested below. By only requiring full compliance after 2016, states and other affected parties can concentrate evaluation activities on new measures rather than expending significant resources to re-evaluate old measures. However, for those programs and measures installed prior to 2016 where evaluations have yet to be done, we recommend that EPA

direct utilities and other program or project providers to use the EM&V guidance and EM&V requirements in the Rule itself in determining the appropriate level of emissions rate credits.

More specifically, we recommend three options regarding use of older evaluations:

1. Any older evaluation can be used to the extent these old evaluations can be demonstrated to employ a methodology approximately equivalent to or more conservative than the EM&V guidance.
2. Since, as discussed below, the common practice baseline approach is defined by EPA to be a form of gross savings that does not specifically account for free riders[3], an older evaluation documenting net savings (net of free riders) can be used. Roughly speaking, the netting out of free riders will compensate for the fact that a common practice baseline was not used.
3. If an older evaluation in fact did not use or come close to using a common practice baseline, a net savings approach or an otherwise equivalent approach, we suggest that a discount factor on the order of 20% be considered (i.e., savings can be estimated to be 80% of an earlier evaluation that does not fully follow this guidance).[4]

This recommendation further recognizes that some states in the country will be ramping up their EE project or program investments during the 2017-2020 timeframe, including efforts to build knowledge and expertise to manage and oversee evaluation efforts by program administrators and regulators. During this ramp up period, education and EM&V training for these states will be very important, and EPA should encourage states and regions to share EM&V information, resources and experiences to help states with limited evaluation experience to leverage learning and tools/resources from other more experienced states.

A second major concern regarding application of the EM&V guidance and timing of installations is in Section 2.3.2 of guidance. EPA first provides that when reporting savings, savings should be based pro rata on the day an efficiency measure was installed. EPA then indicates that for state measure plans, savings should be reported as if they started accruing on January 1 of the reporting year. This latter approach is standard practice in the program efficiency industry, and should be the required practice for either a rate-based or state measures plan approach. Pro rata application for reporting savings is very difficult to track (e.g., date of installation is not tracked and would be difficult to track in some types of EE programs such as upstream incentives provided to manufacturers, distributors or retailers), and simply is not common practice.

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[3] According to the SEE Action Energy Efficiency Program Impact Evaluation Guide, *free ridership* refers to the portion of energy savings that participants would have achieved in the absence of the program through their own initiatives and expenditures (i.e., the participant would have undertaken the energy-saving activity anyway).

[4] Precedent for this level of discounting is consistent with EPA's *Rule Effectiveness Guidance: Integration of Inventory, Compliance and Assessment Applications.* US EPA, Office of Air Quality Planning and Standards, Research Triangle Park NC 27711. EPA-452/R-94-001, January 1994

Further, in Section 2.3.2 of the Guidance, EPA provides that current year *and cumulative* (italics added) savings from a measure/program be based on best available data, and includes an *Example of Forward Adjustments to EE Savings.* The provision to retrospectively update cumulative savings is currently not common practice, because states require incremental annual savings and in some cases lifetime savings (over the life of the installed measures) – states *do not* report cumulative savings from past year installations. Typically, when evaluation studies for a particular program year are completed (e.g., studies are completed in 2015 for 2014 program year savings), the study results of new or updated savings assumptions may be retrospectively applied to the *previous year* 2014 program planning/tracking estimates, but they are not applied to savings for program measures installed prior to program year 2014. Hence, EPA's proposed forward adjustment accounting would be a departure from current practice. While unit savings could be updated for past installations, this would be an added reporting burden, and importantly, if measures within a program changed over time, updating future savings estimates for past installations (i.e., installations prior to the period for which the current evaluation applied) would not be appropriate, and in those situations, should not be required. M&V Reports and verification of those reports could identify these cases.

To address this issue, we recommend[5] that EPA clarify that in most cases, when a program is evaluated per the EM&V guidance[6] these evaluation results can be applied to future years without any further adjustment. Only in specific limited cases should forward adjustment of prior evaluation results be required. Specifically, EPA should clarify that forward adjustments are only needed when:

1. Large energy savings from major programs or projects are at stake - we define "major" programs or projects as those that account for over 10,000 MWH of EE savings a state claims in any year;[7]
2. The mix of measures within a program have not significantly changed such that application of new evaluation results would be reasonable to apply; and
3. The new evaluation results are found by an independent evaluator (as defined later in these comments), to be clearly better/more accurate than the earlier evaluation, after allowing for changes in the market in the intervening period.

[5] NRDC will be commenting separately on forward adjustments.

[6] I.e., this recommendation does not apply to the use of non-conforming evaluations conducted prior to the publication of the final EM&V guidance.

[7] This threshold value is informed by a review of 59 evaluations across 2 states which found that nearly 60% of the evaluations were for programs greater than 10,000 MWH, which we believe is a reasonable threshold to define "major" programs.

C. Comments in Response to EPA's Questions on the EM&V Guidance

In this section, we respond directly to EPA's list of questions in its draft EM&V Guidance seeking feedback on a range of issues.

1. **Does the guidance provide enough information to help EE providers determine what EM&V methods (i.e., project-based measurement and verification, comparison group methods, and deemed savings) to use for purposes of quantifying savings from specific EE programs, projects, and measures?**

The Guidance provides comprehensive and sufficiently detailed information to help EE providers determine what EM&V methods to use, in particular Section 2.1 with the supporting Appendix C that provides examples and reference to key EM&V protocols, such as the U.S. DOE Uniform Methods Project protocols, the International Performance Measurement and Verification Protocol (IPMVP), ASHRAE Guideline 14, etc. See further below for discussion of updating process for the Guidance and referenced EM&V protocols.

However, as explained further below, some clarification is needed to better explain how studies that use M&V as a method for estimating savings, also serve as basis for determining, in part, deemed savings values, and how these values feed into TRMs. This relationship needs to be clarified in the narrative, definitions (glossary), and side bars/boxes, and perhaps would benefit from a visual flow chart.

2. **Does the guidance include sufficient information about the appropriate circumstances and safeguards for the use of deemed savings values? For project-based measurement and verification and comparison group methods?**

Generally, additional guidance is needed for states to address how best to balance the use of the three EM&V methods recognizing the need to achieve rigor while also having ease of use. Reference should be made directly to guidance provided in the SEE Action Network *Energy Efficiency Program Impact Evaluation Guide*,[8] and other documents to help states navigate a realistic and workable EM&V strategy for their EM&V Plan that provides a sufficient level of rigor, while not creating undue burden.

Generally, the Guidance should provide some additional information to describe when the three methods should be used (or not) and under what circumstances.

On **Deemed Savings Values,** consistency in definitions and clear application is needed. First, it would be helpful if the EM&V guidance provided fully consistent definitions at pages 8 and 16. Further, for the definition provided on page 8, the italicized section below may confuse users of the Guidance that try to differentiate among the three EM&V methods in Section 2.1, who may become confused by the relationship (i.e., if a source of deemed savings is previous M&V, then

[8] See www4.eere.energy.gov/seeaction/sites/default/files/pdfs/emv_ee_program_impact_guide_1.pdf .

which method is it?) Explaining the evaluation cycle and process would be helpful. Further, differentiating between a deemed savings value versus a deemed calculation (or savings algorithm) would also be helpful to avoid confusion.

> ***Deemed savings values*** are estimates of electricity savings for a single unit of an installed EE measure that (1) has been developed from data sources (such as prior metering studies) and analytical methods that are widely considered acceptable for the measure and purpose, and (2) is applicable to the situation under which the measure is being implemented. *Common sources of deemed savings values are previous evaluations and studies that involved actual measurements and analyses. With deemed savings, the per-unit MWh values are determined and agreed to by parties prior to EE implementation*. When deemed savings are used to quantify MWh savings, a separate verification process is needed to confirm the quantity of units installed. [Definition at page 8]
>
> ***Deemed savings values:*** estimates of average annual electricity savings for a single unit of an installed EE measure that (a) has been developed from data sources and analytical methods widely considered acceptable for the measure and (b) is applicable to the situation and conditions in which the measure is implemented. Individual parameters or calculation methods also can be deemed, including EUL values. (Definition at page 16)

Also, we notice some potential confusion in the EM&V guidance (at page 17) where EPA states that a provider should "Ensure that deemed savings values:

- Are based on EE measure definition, applicability conditions, ... that are well documented in work papers that are publicly available;
- Are quantified as the most likely averages of electricity savings and other factors …;
- Are developed by independent, third parties and, *whenever possible, are based on empirical techniques such as RCTs and quasi-experimental design*." [italicized by commenters]

The last bullet is again cause for confusion, because it appears to encourage the use of comparison groups and Randomized Control Trials (RCT) which is an EM&V method itself as provided in the Guidance. As suggested above, the relationship between the three methods needs to be clarified to avoid confusion. Perhaps a visual or flow chart could help to accomplish this to provide an understanding on how EM&V activities feed into TRMs. For example, are all values in a TRM considered deemed savings values, even if certain savings values (for a measure of input parameter) were developed based on M&V or comparison group methods?

Importantly, there are two main types of deemed savings that fall along a continuum of the following:

1) Values that are based entirely or partially on previous year EM&V studies, and
2) Values that are based on best available but unmeasured engineering analysis, but that are too a small contribution to savings to warrant detailed studies.

EPA's guidance should make this clearer to avoid confusion.

Also, the use of RCTs is only applicable to certain types of programs (e.g., whole house retrofit done as part of a pilot where customers can be randomly assigned to treatment and control groups), and as such, the reference to *'whenever possible*' should instead say '*where appropriate*'. See further discussion on Comparison Group and RCT method below.

We generally support EPA's specific guidance on use of Deemed Savings Values, as set forth at page 206 in the MTR and in the Guidance. With regard to the provision that Deemed Savings Values be reviewed and updated based on EM&V analyses at least every three years, we believe this is appropriate in most cases and is consistent with common practice today in EM&V of utility EE programs. However, there may be some cases where review and updating of deemed savings values may be done less frequently by a utility or non-utility program provider, for example for programs that provide a small level of energy savings; e.g., less than 10,000 MWH We recommend that the final guidance allow for such instances with the utility or other program implementer bearing the burden of proof that this won't materially affect overall energy savings.

Technical Reference Manuals (TRMs) – Development, Updating and Review Process. We generally recognize the value of developing utility, state or regional TRMs, consistent with EPA's language in the Guidance where it states "Ongoing and new state, regional and federal efforts to improve the quality and documentation of TRMs are encouraged and can support high-quality values for compliance with the EPA's emissions guidelines and reduced EM&V costs." (at Section 2.4.1 page 16) Many states could benefit from new TRM resources and guidance to support the inclusion of EE in their compliance plans, and regional efficiency organizations and/or other organizations can help to facilitate these efforts. We further point to existing documents that can support a consistent TRM updating process.[9]

With regard to TRM review processes, the MTR, at page 517, provides the following:

> "Prior to use in an EM&V plan, all TRMs must undergo a review process in which the public, stakeholders, and experts are invited – with adequate advance notification (via the internet and other social media) – to provide comment, have at least 2 months to provide comment, and in which all such comments and associated responses are made publicly available. All TRMs must also be publicly accessible over the full period of time in which they are being used in conjunction with an EM&V plan for the purpose of quantifying savings, and must be subsequently updated in the same manner at least every 3 years. The TRM must indicate, for each subject EE measure, the associated electricity savings value, the conditions under which the value can be applied (including the climate zone, building type, manner of implementation, applicable end uses, operating conditions, and effective useful life), and the manner in which the electricity savings value was quantified, which must include applicable engineering algorithms, source documentation, specific assumptions, and other relevant data to support the quantification of savings from the subject EE measure.

[9] See TRM Updating Process Guidelines developed by Northeast Energy Efficiency Partnerships, Inc. at www.neep.org/trm-updating-process-guidelines-0.

While most of these requirements are appropriate, we believe it unnecessary to reference the use of 'social media' where this detail would be more appropriate for inclusion in guidance than the model trading rules. Further, we recommend that the TRM review period should be at least 1 month, as opposed to 2 months, given experience in some states.

For **Project Based M&V**, we recommend that the MTR and EM&V guidance simply refer to this approach as 'M&V,' consistent with prevailing protocol documents such as the SEE Action Impact Evaluation Guide and the US DOE Uniform Methods Projects. Creating the term/jargon 'PB-M&V" can lead to unnecessary confusion by introducing a new term to the evaluation field.

Importantly for the M&V approach, there is no mention in Section 2.1 about the use of statistical sampling to inform program level savings where the M&V method is used on a sample of projects. We suggest the Guidance generally needs more information on statistical sampling, and can borrow from as well as directly reference the US DOE's Uniform Methods Project Cross Cutting guidance document on statistical sampling.[10]

On the **Comparison Group Method,** see our comments below under #3.

3. Should the guidance specifically encourage greater use of comparison group approaches? Under what circumstances is the application of such empirical methods practical and cost-effective? Would additional guidance be useful on "top-down" econometric EM&V methods, and the ways in which such methods can be used to verify savings at a high level of aggregation?

The MTR and EM&V guidance both encourage the use of the Comparison Group method using Randomized Control Trials (RTC). In the EM&V Guidance, EPA states [at Section 2.1 under PB-MV] that "PB-MV and deemed savings are commonly used for determining savings from individual EE measures and projects. By contrast, comparison-group methods are usually only used to estimate savings from EE programs, but the use of such methods could be expanded further."

Whereas in the MTR [at page 206], EPA makes a broader statements that: "Where feasible, the EPA is proposing to encourage the use of RCT methods, which determine savings on the basis of energy consumption differences between a treatment group and a comparison group, and therefore increase the reliability of results."

We believe that for major programs with substantial energy savings (i.e., representing 10,000 MWH or more of EE savings a state claims in a year) and number of participants, periodic statistical analyses between a treatment group and control or comparison group should be

[10] See US DOE Uniform Methods Project *Sampling Design Cross-Cutting Protocol* (April 2013) at www.energy.gov/eere/about-us/ump-protocols.

encouraged. Such studies can use billing data and other data to estimate energy savings of participants relative to an appropriate control group of non-participants. Comparison group methods include not only RCTs but Randomized Encouragement Designs[11] and quasi-experimental methods like Regression Discontinuity (which employs arbitrary program eligibility requirements or "natural experiments" to create a control). These quasi-experimental methods are flexible, and are more broadly applicable to programs than the RCT approach.

Such studies do not need to be conducted every year, but are a good method to help calibrate deemed savings estimates, with studies repeated at least once every 3 years and the new results applied going forward for new measures installed. Application of evaluation results to measures previously installed should be restricted, as recommended above in Section B.

However, while a valid and rigorous method for estimating EE program savings, the Comparison Group method and RCT technique are applicable to only certain types of programs (e.g., whole house residential retrofit with large numbers of participants, behavioral programs), and are not relevant for many types of efficiency programs that are either measure specific and represent a small portion of overall facility use, or are custom efficiency projects (e.g., for C&I programs), as supported in Table C-1 of Appendix C in the EM&V Guidance. As such, it is reasonable to encourage use of comparison group approaches for specific program types, and EPA should make this clear in its model trading rules. Further, the MTR Section 62.16455(c)(7)(iv)(A) should note that the comparison group is meant to be as similar to the treatment group as possible, because the goal is to establish a good counterfactual.

Also, while RCT is a powerful technique, it cannot be used for full-scale programs (or for legally required building energy codes or state level appliance standard) because all potentially eligible customers can (or should) participate and there cannot be a randomly selected control group.

It is important to note that the emergence of automated advanced data analytic tools and availability of AMI data may be able to support streamlined and improved use of the Comparison Group method and RCTs. However, EPA should recognize and clearly distinguish the different application of the methods to different program models/approaches to avoid confusion.

On Top-Down EM&V Method, EPA asks if additional guidance on "top-down" econometric EM&V methods would be useful. In our opinion, top-down evaluation is a potentially promising technique, but few studies have been done to date. Based on experience to date, and per the US DOE UMP Net Savings protocols, top down methods estimate net, not gross savings. Regulatory agencies and IOUs have begun to explore "top-down" analysis as a supplemental or alternative approach to measuring net energy program impacts, such as in Massachusetts where

[11] Where REDs is a type of RCT in which participation in the program is not restricted or withheld to any household in either the treatment of control group. See the SEE Action guidance on EM&V for Residential-Based EE Programs at www4.eere.energy.gov/seeaction/system/files/documents/emv_behaviorbased_eeprograms.pdf.

recently pilot studies completed in 2015 used two types of top-down models.[12] This analysis is an econometric model using aggregate cross-sectional and time series consumption and econometric data. It is referred to as "top-down" because it extracts the overall EE program portfolio effect from a decomposition of total aggregate consumption. In principle, it captures the full program effect, and a properly structured top-down model can potentially provide relatively inexpensive estimates of program-induced savings estimates for all geographic areas in the study as well as confidence intervals and precision levels for net energy savings from the entire portfolio of programs. However, the models face substantial data limitations resulting in compromise between the ideal specification and the types of data available at various levels of aggregation. It is nearly impossible to account for all factors that influence consumption, particularly given the data limitations, so that model results are potentially biased by omitted or incorrectly specified variables or model forms. Fitting a model across a longer time series requires consistency over an extended time in the overall pattern of how the non-program and program variables affect consumption. Utilities and regulatory agencies can work toward developing a platform for estimating effective top-down models by maintaining historical consumption and program tracking data at the individual account level. Currently, these data are typically not retained for more than 3-5 years and do not capture data sufficient to properly account for the cumulative effects of programs over time.

A good example of top-down evaluation is Horowitz's 2011 evaluation of California efficiency efforts. This evaluation found an average of 4.8% annual electricity savings in 2006 and 2007.[13] However, other top-down evaluations have run into challenges. For example, Arimura et al. did an econometric evaluation on savings from utility DSM programs, but found they could not statistically identify savings more than six years from measure installation.[14] It is unclear if the measures stopped saving after six years or if "noise" in the data made it difficult to identify such savings with precision. We suspect the latter explanation, which could mean that top-down evaluation might not be a good method to estimate savings persistence. Likewise, ACEEE worked with researchers from Humboldt State University for several years to come up with a measure of residential EE improvements using state-level data. The thinking was that the residential sector was the most straightforward and once methods could be developed for the residential sector they could move on to other sectors. However, they found that due to the quality and the coarseness of the available data, it was hard to tease out more than trends.[15]

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[12] See ma-eeac.org/wordpress/wp-content/uploads/Top-down-Modeling-Methods-Study-Final-Report.pdfE.

[13] Horowitz, Marvin. 2011. *Macro Consumption Metrics White Paper*. CALMAC. www.calmac.org/publications/HOROWITZ-MacroConsumptionWhitepaper-Final-8-24-11_Public.pdf .

[14] Arimura et al. 2009. *Cost-Effectiveness of Electricity Energy Efficiency Programs.* Washington, DC: Resources for the Future. www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-09-48.pdf.

[15] Foster, et al. 2012. *The 2012 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/e12c.

Given the limitations and challenges discussed above, it is premature to recommend top-down evaluation as a preferred approach at this time. Instead we recommend that EPA encourage experimentation with these approaches but not yet specifically encourage their use.

4. Is the guidance in Section 3 on particular EE program types (consumer-funded EE programs, project-based EE, building energy codes, and appliance standards) helpful, clearly presented, and sufficient/complete? Can this guidance be reasonably implemented, considering data availability, cost effectiveness, accuracy of results, and other factors?

In general we think the Guidance can be reasonably implemented, but we have specific suggestions for improvement. We make these suggestions below by program type.

Demand-Side EE Programs. Section 3.1 includes lists of common direct action and indirect action programs. The list of indirect action programs should include "Upstream incentives provided to retailers, distributors, and/or manufacturers." In addition, the applicable guidance for indirect action programs should include the same EM&V methods that are specified for direct action programs; i.e., project-based measurement and verification and deemed savings, in addition to comparison group approaches. All three approaches can be applied to upstream incentive programs where information is available or can be obtained on consumers that obtained EE measures through the program.

EM&V of Building Codes. Section 3.3 of the draft guidance discusses evaluation of building codes. Building codes are one of the major EE policies states and local jurisdictions have and can use and therefore devoting a section of the EM&V guidance to building codes is entirely appropriate. However, the availability of building codes is almost entirely nullified by footnote 58 which states that "adopting codes that the federal government has already determined to be cost-effective cannot be used for compliance with EPA's emissions guidelines." Likewise, on p. 37 of the draft guidance, it states that: "Specific building energy code actions that states and local governments may take include: Adoption of new energy codes with greater EE requirements than codes that have already been determined by the federal government *to be cost effective*" (italics added). *We implore EPA, in the strongest possible terms,* to clarify that new building codes can receive savings credit if adopted after the final rule and not prevent states from claiming savings from codes simply because the federal government has found them to be cost-effective. Under existing law, DOE is supposed to speedily review model energy codes for energy savings; cost-effectiveness is not part of the current requirement. Cost-effectiveness should be irrelevant for whether a measure counts for CPP credit. We suspect that the intent of this footnote is to not give credit for code savings after DOE determines that a new model code will save energy, based on the mistaken notion that after DOE makes such a determination, then states are required to adopt this model code. But even when DOE determines that a code saves energy, it does not mean that states or local governments adopt this code. Nominally, under federal law, states are supposed to adopt new model commercial codes; they only need to "consider" new residential codes. Many states or local governments are slow to adopt new energy-saving codes, even commercial codes, and some states never adopt these codes. In practice, adopting cost-effective codes is not mandatory to states as there are no adverse legal

consequences for not adopting a code and DOE even recognizes that in some states "home rule" laws prohibit adoption of a statewide code. Providing credit under the CPP for adopting and enforcing new building codes would provide a useful incentive to spur state or local code adoption. But making new codes ineligible for CPP credit could well have the opposite effect since this footnote leaves only a small time window for receiving credit for savings from new building codes – at most the window extends from when a model code is published until when DOE determines the code to save energy or be cost-effective.

In addition, we find section 3.3 of the draft guidance too complicated by first asking states to document NOMAD (naturally occurring market adoption) and then using NOMAD to establish a CPB. Instead, we recommend that states directly define a common practice baseline. Such a baseline could be defined as part of a state-specific baseline study. In addition, we recommend that EPA provide guidance on what states or local governments can presumptively use as a CPB for determining code savings. For the first new code adopted after the publication of the final Rule, we recommend that whatever code a state or local jurisdiction had in place as of the date the CPP Final Rule was published[16] in the Federal Register be used as the baseline. We suggest this because some buildings exceed codes and some fall short, making the code an approximation of common practice. If a state or local jurisdiction has no energy code, then common practice as of this date would need to be documented. Then for subsequent code revisions, the baseline for the new code would be the prior code, as suggested on page 39 of the draft EM&V guidance.

Another option is to establish a nationwide CPB, based on the most commonly used codes now used by states. The most likely such baseline would be the so-called "ARRA codes" that states were required to commit to as a condition of receiving funds under the American Recovery and Reinvestment Act. These codes are ASHRAE/IES 90.1-2007 for commercial and high-rise residential buildings and the 2009 International Energy Conservation Code (IECC) for single-family and low-rise multifamily homes.[17] As of October, 2015, 41 states have adopted this ASHRAE code or its equivalent, while 38 states have adopted this IECC code or its equivalent.[18] If this option is chosen, the national CPB will need to be periodically updated – 2007/2009 codes will not be the baseline forever.

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[16] Potentially other dates could be used, such as Dec. 31, 2012 (the end of the CPP baseline period), or June 18, 2014 (the date the draft CPP was published).

[17] Alternatively, some have argued that compliance with these codes is far from perfect and therefore if the assumption is 100% code compliance in the baseline, then earlier codes should be used such as ASHRAE 90.1-2004 and the 2006 IECC.

[18] Gilleo et al. 2015. *The 2015 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. See aceee.org/research-report/u1509.

Furthermore, we note that the draft guidance explicitly includes a factor for code compliance and provides some guidance on determining compliance. We support these provisions as improving code compliance can be an important energy-saving strategy. Programs that focus on improving code compliance with existing or new building energy codes (and not necessarily code adoption) that can document energy savings based on EM&V following the Guidance should be eligible for energy savings credits. EPA should make specific reference to the compliance methodology developed by DOE.[19] In addition, other methods are in development by others and these should be reviewed by EPA once completed, and referenced by EPA if they are found acceptable.

5. Is the guidance on important technical topics (e.g., common practice baselines, accuracy and reliability, verification) helpful, clearly presented, and sufficient/complete? Can this guidance be reasonably implemented, considering data availability, cost effectiveness, accuracy of results, and other factors?

Common Practice Baseline (CPB): EPA proposes to use a CPB approach for purposes of establishing a baseline for EM&V savings estimates. As defined in the MTR and the supporting draft EM&V guidance for EE, CPB is consistent with baseline definitions used by many programs (Section 2.2.1 of Guidance). This said, some further explanation on CPB would be useful, making clear that this will depend on what is common in a particular market, for specific efficiency measures in specific regions. In other words, CPB is, simply, common practice. If it can be shown, for example, that common practice is existing conditions, then that is common practice, or if CPB is 25% better than ENERGY STAR, then that is common practice, etc.

As explained in the draft Guidance document at the top of p. 12, existing programs that use a baseline that is consistent with CPB as defined in the MTR and draft EM&V guidance can report and receive ERCs based on these savings without further adjustments. Other programs that do not currently use CPB will need to modify their baseline assumptions going forward for the purpose of obtaining ERCs under the Clean Power Plan.

EPA indicates in the draft Guidance that CPB is consistent with gross savings. However, we find that the terms gross and net savings can have different meanings to different people, as evidenced in the different ways net versus gross savings are used and reported across states. Due in part to these differences, some people consider the CPB to be the baseline for gross savings estimation[20] (e.g., as stated in EPA's draft EM&V guidance) and others consider it to be a baseline that produces results that are more akin to net savings (e.g. as discussed in section 3.3 of

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[19] The methodology referenced was developed by the Pacific Northwest National Laboratories in conjunction with the U.S. DOE's Funding Opportunity Announcement, "Strategies to Increase Residential Energy Code Compliance Rates and Measure Results." See eere-exchange.energy.gov/FileContent.aspx?FileID=e6fd3f56-d6cc-4db3-8d26-6b52c4e9c27a.

[20] For example gross savings are sometimes calculated relative to what is currently installed instead of relative to the common practice baseline, resulting in significant differences in the savings estimated.

the DOE Uniform Methods Project publication *Estimating Net Savings: Common Practices*.[21]) In order to avoid confusion with different definitions of net and gross savings, and the fact that the CPB can be used in estimation of either net or gross[22] we suggest that the EM&V Guidance avoid categorizing CPB as either gross or net but instead be rewritten to simply describe the CPB approach, perhaps with a footnote explaining that some consider CPB produces gross savings and others consider it produces net savings. This discussion should make clear that the CPB allows for normal market adoption of efficiency measures, and thus no further adjustments are needed. We specifically recommend that in Section 2.2.1 of the Guidance, the paragraph at top of page 12 should clarify that the CPB approach supports inclusion of a range of a program strategies, including retrofit, lost opportunity/new construction, early replacement, and market transformation.[23]

While we generally support the CPB approach, we have four concerns that we believe need to be addressed in the final EM&V guidance:

1. The CPB concept is still new to many states, utilities and other EE program and project implementers. These entities may need help in figuring out how to properly implement this approach. To address this concern, we recommend that EPA or DOE develop additional CPB methodological guidance and proxy values where possible for common EE measures and update these estimates periodically. Such values may vary by climate region and market as appropriate. Use of these proxy values would not be required and should not be used if a program or project implementer believes it has better estimates or if the program or project implementer has reason to believe the proxy values are not accurate in their situation. Furthermore, EPA may want to specifically note the work of the Northwest Regional Technical Forum in defining a CPB for specific measures in the Northwest.

2. While the CPB approach tends to work well for single measure programs or programs with just a few measures, for comprehensive projects involving dozens of measures, such as many energy-savings performance contracts, having to estimate a CPB for each individual measure can be difficult and represents a major change from current business practices. To address this problem, we have worked with a coalition of energy service companies (ESCO's) to develop an *optional* equivalent approach that can be used for ESPCs and other comprehensive retrofit programs.

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[21] energy.gov/sites/prod/files/2015/01/f19/UMPChapter17-Estimating-Net-Savings.pdf .

[22] See Rufo, Mike, Ew Gross! Cleaning Up Gross Baselines, IEPEC 2015

[23] We define 'market transformation' as a reduction in market barriers resulting from a market intervention, as evidenced by a set of market effects, that is likely to last after the intervention has been withdrawn, reduced or changed – per definition provided in the SEE Action EE Program Impact Evaluation Guide at www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

a. Specifically, as an optional alternative to the standard CPB approach, we believe that EPA's EM&V guidance should permit baselines consistent with existing conditions, but coupled with oversight and adjustment at a programmatic level. In this option, M&V will occur at the project level (as it does today), and the evaluation will occur at the program level (in this case, a program of projects at multiple facilities). The state, an ESCo, or a consortium of ESCos (or EPA or its designee in a federal plan) evaluates the program and develops an adjustment factor based on certain criteria found during the evaluation. The adjustment would occur at the program level rather than at an energy conservation measure or a project level.

b. For program evaluations, states/ESCOs (or the EPA/its agent in a federal plan) would perform an analysis of a sampling of performance contracting projects to determine the realization rate of guaranteed savings using pre- and post-installation project M&V data (ideally available in an EE project registry), spot checks of installations at selected sites, and a factor for the annual baseline level of efficiency improvement at similar facilities in the state or region. This latter factor would come from an analysis of historical utility bill data from a sample of similar facilities (e.g., schools, universities, hospitals), adjusted for factors known to impact consumption (e.g., weather and occupancy). This baseline rate would be subtracted from the realization rate. In this way, a program-level adjustment factor that includes average savings realization and business-as-usual adjustments to the existing conditions baseline could be determined on a periodic basis and applied to all similar EE projects. The program-level adjustment factor would be periodically reassessed, e.g. every three years. If the evaluation is done by ESCos, then it needs to be reviewed and approved by a state agency.

3. In the case of building codes, we find the description in section 3.3 of the draft guidance on building codes to be overly complicated and imprecise. We discuss our specific concerns and ways to address them under question 4.

4. Section 2.2.2 of the EM&V Guidance regarding early replacement programs, sometimes referred to as retrofit programs, calls for application of the dual baseline approach, using existing conditions as the baseline for the RUL of the replaced equipment and the CPB applicable to the new equipment for the remainder of the new equipment EUL. We have two comments regarding this:

    a. It is important to bear in mind that few Program administrators are currently using a true dual baseline calculations where two distinct streams of savings are tracked over the life of the measure, for various reasons, including difficulties in tracking a different value of the savings for each year the measure is in place (see Rufo, 2015);

b. We recommend that EPA allow for an optional alternative approach of an approximation to the dual baseline that accurately captures the lifetime savings with a single, shorter baseline period EUL_{new} than the full EUL.[24] This approach allows a simpler tracking of the savings consistent with the dual baseline approach by reducing the measure life from the EUL and using the estimate of first year annual savings, instead of year by year annual savings or two annual saving values and two measure lives (RUL and EUL). This approach, though it inflates savings in some years between the RUL and $EUL_{new,}$ zero out savings in the later years EUL_{new} to EUL. Similar approximations to true dual baseline calculations are currently used in some jurisdictions.

On **Accuracy and Reliability,** the MTR, at page 209 provides that "Sampling of populations is appropriate, provided that the quantified MWh derived from sampling have at least 90 percent confidence intervals whose end points are no more than +/-10 percent of the estimate."

This level of confidence and precision is commonly used in EM&V studies which involve sampling of participants in utility EE programs today, and is considered a best practice. However, we recommend that the Guidance note that there are situations where either a higher or lower confidence interval or level of precision is appropriate. For example, behavioral programs are often evaluated with a 95% confidence interval, while an 80% confidence interval may be acceptable for individual programs that contribute minimal energy savings to the total savings achieved by a utility or other provider implementing a portfolio of energy savings programs. We recommend that the 90/10 level of confidence and precision be applied using either of two approaches, where it's applied to only major programs (i.e., that represent more than 10,000 MWH of savings) or where a state can demonstrate that its total portfolio of EE programs used to support ERCs in its state compliance plan meet an overall 90/10 confidence/precision level.[25]

Further, the Guidance should make clear that sampling is often used not just to determine a savings estimate directly (e.g., from a population of industrial projects) but can also be used to determine key parameters for a deemed savings calculation (such as hours of use of operation). EPA should clarify that sampling requirements should apply to parameters that will be used to estimate savings from programs that represent major savings from a program portfolio

On **Measure Life and Persistence of Savings,** EPA requires that EM&V Plans must address how the duration of EE program or project electricity savings will be determined, using industry

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[24] The shorter life EUL_{new} would equal the annual savings for the first stream of savings (difference in energy usage between existing condition and the newly installed efficient measure) times the RUL plus the second stream of savings (difference in energy usage between common practice baseline and the newly installed efficient measure) times the (EUL – RUL) all divided by the annual savings for the first stream of savings. Evaluators would need to undertake studies to estimate these values for different measures.

[25] This is a consistent approach required by the system operators for energy efficiency in wholesale capacity markets i.e., ISO New England and PJM Interconnection.

'best-practice' protocols and procedures involving annual verification assessments, industry-standard persistence studies, deemed estimates of effective useful life (EUL), or a combination of all three. We note that Chapter 13 of the Uniform Methods Protocols, Assessing Persistence and Other Cross-Cutting Methods Protocols, provides helpful discussion of the data or benchmarking approach and periodic field studies. We support all of the methods identified by EPA, but expect many states to ultimately rely most heavily on industry-standard persistence studies and deemed estimates. We encourage the EPA and DOE to continue to develop tools and resources for states to assess persistence of savings.

In practice, field studies of long-term measure life and energy savings persistence by utilities are infrequently done as part of program evaluation because of the high cost and inherent research challenges especially with long-lived (e.g. over 5 year EUL) measures. A number of industry-standard survival curves have been published and make it easier for utilities and states to estimate EUL for common measures. The Guidance should support use of and provide references to these curves.

Some utilities or regions have conducted meta-analyses and other cross-cutting studies to estimate EUL and/or annual savings degradation for commonly used measures or collections of measures (e.g. HVAC system improvements) and then periodically update these measures. We believe that this approach should be encouraged. Also, states or utilities that currently lack such studies should be allowed to reference and use measure life or savings persistence studies from other states or utilities for particular types of EE measures.

6. **How useful and usable is the guidance, overall? Does the relationship between the component parts (i.e., Sections 1-3 and Appendices A-C) clear and relatively easy to follow? Is each of these sections and appendices helpful, clearly presented, and sufficient/complete? What specific examples, graphics, or other visual elements would help illustrate concepts described in the guidance.**

In general, we believe that the draft EM&V guidance is mostly workable for those who understand EM&V but we are concerned that, as written, some of the language and description may be too complicated for some of the air regulators and others who are new to EE EM&V. Therefore, as noted in our introduction, we recommend that simple explanations and graphics/visuals be prepared to help explain the key points to those without extensive EM&V experience. In addition, use of evaluation jargon and acronyms should be minimized (e.g. NOMAD and PB-M&V). In the measurement and verification industry, project M&V and supporting IPMVP framework is well known, and introducing the acronym PB-M&V seems unnecessary. We suggest simply using the term project M&V. And rather than introducing the term NOMAD we suggest rewriting these sections to refer to the CPB instead.

Also, EPA should consider developing a section of its EM&V guidance or a series of short factsheets that explains roles and responsibilities for different parties: air regulators, verifiers, project developers, advocates, and public utility commissions.

7. **Does the guidance *not* cover any important EM&V topics relevant to fulfilling the EM&V related requirements of the emission guidelines? Is additional guidance needed**

to support the implementation of other eligible zero- and low-emitting measures that are directly metered? What topics, if any, are unnecessarily included?

We recommend that EPA provide sample EM&V plans for some common EE policies, programs and measures to help show states exactly what they need to include in their EM&V plans and provide a template that states could modify. For example, templates could be provided for new state or local building codes, residential appliance, lighting and weatherization programs, commercial and industrial prescriptive and custom rebate programs, and energy savings performance contracts.

Further, there are industrial EE programs for which the draft guidance is not fully suited. Some industrial measures are well suited to use of deemed savings or project based M&V methods discussed. However, site-specific considerations and variable production or other activity levels can be complexities. We note and recommend the *Superior Energy Performance Measurement and Verification Protocol for Industry* as a valid protocol for manufacturing and other pertinent industrial activities and facilities. The protocol was developed by U.S. DOE to evaluate and confirm energy performance of facilities participating in the U.S. DOE-supported Superior Energy Performance.[26] That protocol provides detailed instructions for determining "energy performance improvements" (i.e., energy savings) taking into account the need to adjust baselines for varying production levels and other factors.

Other protocols have also been developed, such as in use in strategic energy management programs in the northwest.[27]

In addition, the EM&V Guidance document would benefit from the addition of a section addressing joint evaluation of EE when it occurs in combination with other demand-modifying activities, such as demand response and distributed generation, where the latter is currently in the form of solar/PV, but in the future may eventually include onsite storage and perhaps other activities such as siting of electric vehicles.

There is little, if any material on this topic. In 2007, Lawrence Berkeley National Laboratory published a paper on the topic of integrating EE and demand response policy arenas,[28] and since

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[26] U.S. DOE. 2012. See energy.gov/sites/prod/files/2014/07/f17/sep_mv_protocol.pdf.

[27] For an example of the evaluation approach used in the Northwest, see the Northwest Energy Efficiency Alliance report: NEEA Industrial Initiatives – Market Progress Evaluation Report #8 (April 29, 2014; Report # E14-285) at neea.org/docs/default-source/reports/neea-industrial-initiatives--market-progress-evaluation-report-8.pdf?sfvrsn=10.

[28] Edward Vine. The Integration of Energy Efficiency, Renewable Energy, Demand Response and Climate Change: Challenges and Opportunities for Evaluators and Planners. Lawrence Berkeley National Laboratory, Berkeley, CA. 2007. See eetd.lbl.gov/sites/all/files/lbnl-62728.pdf

that publication, the phenomenon of joint occurrence of EE, demand response and customer-side distributed generation at individual sites has grown.

However, in particular from a utility-program perspective, these resources are offered through programs that arise in different regulatory arenas, are administered in different program implementation structures, and are evaluated separately. Recent developments, most notably in the context of the New York Public Service Commission's Reforming the Energy Vision (REV) proceeding, are actively exploring regulatory changes to promote more efficient use of energy, deeper penetration of renewable energy resources such as wind and solar, and wider deployment of "distributed" energy resources, such as micro grids, on-site power supplies, and storage. It will also promote greater use of advanced energy management products to enhance demand elasticity and efficiencies.[29] New York's vision is that these changes will empower customers by allowing them more choice in how they manage and consume electric energy, leading to energy savings that can help the state meet its aggressive greenhouse gas emission reduction goals.

While there is currently little material on evaluating EE in these circumstances, it would be an oversight if the EM&V Guidance overlooked this topic. Therefore, we recommend that EPA include a section in the Guidance that at least makes note that future research is needed on this topic, and will be considered as updates are made to the EM&V Guidance.

8. How can the guidance most effectively anticipate the expected changes and evolution in quantification and verification approaches over time (given the time horizon for the emission guidelines)?

The Guidance should discuss and reference the emergence of new forms of data collection via AMI, smart thermostats and appliances, and the use of advanced data analytics that support automated M&V. While the current focus of advanced data analytic tools is to provide savings opportunity assessment and to engage customers, these tools are also evolving to serve as an automated M&V tool, applicable specifically to either single measure or whole building programs where large samples of building interval data through AMI is available for analysis.[30] Advanced analytics can also be used to help identify savings from large C&I projects in near real-time as discussed in a December 2015 ACEEE report.[31] We suggest the EM&V guidance make note of these developments and support their use, including referencing work being done to standardize testing of these advanced data analytic tools by LBNL.[32]

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[29] Michael Ihesiaba and Mahdi Jawad. Evaluation, Measurement and Verification as we Reform the Vision." Proceedings of the International Program Evaluation Conference, 2015. www.iepec.org/?cat=18.

[30] See *Changing EM&V Paradigm Report* published by the Regional EM&V Forum (December 2015) at www.neep.org/changing-emv-paradigm.

[31] Rogers, Ethan, et al. 2015. *How Information and Communications Technologies Will Change the Evaluation, Measurement, and Verification of Energy Efficiency Programs*]. ACEEE. aceee.org/research-report/ie1503.

[32] See eis.lbl.gov/auto-mv.html.

Further, the EM&V Guidance should set forth how the guidance document will be updated, through what process, managed by what agency/entity, and in what timeframe or cycle. Specifically, we recommend that EPA periodically update the Guidance document every three years and solicit input at the beginning of the process and on a draft.

Further, the referenced EM&V protocol documents in Table 2-2 of the Guidance should also be periodically updated, as these documents themselves may not otherwise be regularly updated and may not reflect best current practice. New or revised protocols should be added to the list as they become available.

D. Comments on Specific Sections of EM&V in the MTR and EM&V Guidance

1. Reporting Timeframes and Considerations

In the MTR, EPA sets forth that in order for a compliance plan to be 'presumptively approvable' an ERC provider must submit periodic M&V reports to document and describe how each requirement was applied after implementation of an EE project, program or policy. Such reports must specify resulting MWh savings determined on a retrospective (ex-post) and MWh values may not be determined using projections or other ex-ante quantification approaches.

EPA further sets forth in the MTR the following:

- A first M&V report to document that EE measures were installed or implemented consistent with description in approved eligibility application.
- Each following M&V report must identify time period covered by M&V report, describe how methods specified in EM&V plan were applied during reporting period, and document MWh savings verified for period covered by M&V report.
- Any change in savings capability of eligible resource during the M&V report period must also be included in the M&V report, along with date on which change occurred, and information sufficient to demonstrate whether the eligible resource continued to meet all eligibility requirements during the period covered by the M&V report.

We recommend that EPA encourage states to require that ERC providers use standardized reporting formats and tools to report and document the incremental annual and cumulative annual savings of their EE project, program, policy etc. Such reporting should also refer to the EM&V plan and confirm that the relevant baseline, method, M&V protocol and/or guideline was properly applied.

Examples of such standardized reporting forms include those recently developed for the Regional EM&V Forum.[33] These forms were designed to create greater transparency in EM&V practices/methods used, allow for easily identifying relevant EM&V protocols used, and

[33] See the Digital EM&V Methods Reporting Forms developed by the Regional EM&V Forum, a project of Northeast Energy Efficiency Partnerships included 9 jurisdictions in the Northeast and Mid-Atlantic regions in 2015.

providing study results in a comparable format. These forms can help states streamline EM&V reporting and review process. While still in the pilot phase, the on-line standardized forms, with modest modifications, could serve as standardized reporting forms to support EM&V documentation for CPP purposes. For example, use of these standardized forms, or some modified version, are being considered as part of the development of the National Energy Efficiency Registry (NEER), a project underway that is being led by The Climate Registry (TCR) in partnership with US DOE and six states.[34]

Additionally, the California Public Utility Commission very recently issued Impact Evaluation Standard Reporting Guidelines[35] that set forth specific reporting requirements for inclusion in impact evaluation reports to support greater consistency in reporting evaluation results by measures groups.

Examples also exist for reporting EE impacts. The Lawrence Berkeley National Laboratory has a new standardized reporting initiative, particularly well-suited to states that have less experience with energy efficiency. The EPA may consider referencing the *Flexible and Consistent Reporting for Energy Efficiency Programs* resources.[36]

We encourage EPA to include template EM&V Plans and M&V reports in the final EM&V Guidance, building from existing EM&V plans and reporting forms.

2. Savings Verification

The MTR states (at page 188) that "Applicable submittals under a rate-based emission trading program include eligibility applications (including EM&V plans), monitoring and *verification reports*, and *verification reports." (italics added)*

This double use of the term 'verification reports' is confusing. There are M&V reports in evaluation practice, where the 'V' part of the M&V refers to verification of measure installations and often involves a sample of projects in a program, where this is typically conducted by an independent evaluation contractor (e.g., in the case of consumer funded programs.). EPA's latter reference to "Verification" appears to be broader than verification of installations, where in the MTR, EPA sets forth that a Verification Report must be submitted by an independent verifier (for an ERC eligible resource) whereby such a report would:

1. Provide verifier findings, based on assessment of all relevant requirements, information and data, misstatements etc.

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[34] The formation of NEER is being funded through a U.S. DOE award, whereby TCR and its partners (the states of Tennessee, Georgia, Michigan, Minnesota, Oregon, Pennsylvania), will facilitate a two-year, state-driven stakeholder process to develop the NEER's principles and operating rules, and an implementation roadmap. In parallel, software provider APX will develop a demonstration of NEER functionality, informed by TCR's research.

[35] See www.energydataweb.com/cpucFiles/pdaDocs/1399/IESR_Guidelines_Memo_FINAL_11_30_2015.pdf.

[36] See emp.lbl.gov/publications/flexible-and-consistent-reporting.

2. Verify the eligible resource exists and has, or will be, saving electricity in manner required; that EM&V plan meets its requirements; and any other information required to assess accuracy of verification report.
3. As part of M&V report, describe the review conducted by the verifier i.e., adequacy and validity of info and data submitted to quantify savings identified in the EM&V plan and M&V report; QA/QC of data; that the M&V report meets its requirements.

Given the broader scope of this 'verifier role' and Verification Report, we recommend that in order to avoid confusion, EPA consider using a different term such as "Certifier" and "Certification Report," which addresses the requirements above.

This recommendation also applies to EPA's reference to 'independent verification,' per the Final Emissions Guidelines, where it states (at §60.5835 page 1271):

> "Inclusion of an independent verification component provides technical support for state regulatory bodies to ensure that eligibility applications and M&V reports are thoroughly reviewed prior to issuance of ERCs. Inclusion of an independent verification component is also consistent with similar approaches required by state PUCs for the review of demand-side EE program results and GHG offset provisions included in state GHG emission budget trading programs.

While the Emission Guidelines language is final, the MTR and supporting EM&V Guidance should clarify that reference to *'verification'* to ensure "eligibility applications and M&V reports… prior to issuance of ERCs" is much broader than the traditional practice of verifying installations of efficiency measures, and should generally be viewed as a certification process. Such a certification approach is used, for example, for EE resources that clear the wholesale capacity market.[37]

The Final Emissions Guidelines also refer to the 'qualification status' of an independent verifier (or certifier) as follows:

> State plans with rate-based emission trading programs must include requirements regarding the qualification status of an independent verifier. An independent verifier is a person (including any company, any corporate parent or subsidiary, any contractors or subcontractors, and the actual person) who has the appropriate technical and other qualifications to provide verification reports. The independent verifier must not have, or have had, any direct or indirect financial or other interest in the subject of its verification report or ERCs that could impact its impartiality in performing verification services. State plans must require that a person be approved by the state as an independent verifier, as defined by this final rule, as eligible to perform the verifications required under the approved state plan."

[37] See ISO New England Manual MVDR Section 13.2 and 14.2 requirements at www.iso-ne.com/participate/rules-procedures/manuals (Revision 06 - June 1, 2014)

Currently, most if not all states do not have a formal 'independent evaluator certification' process, but the evaluation community is actively exploring such a process with US DOE to help establish and promote a certification process that meets EPA's requirements.

Further, such a certification process is important to services provided by designated ERC accounting agents whereby ERCs are certified by state-approved certifiers, either state employees or individuals that are contracted to perform this function.

We recommend that EPA's MTR and EM&V Guidance final documents make very clear the distinction between the common evaluation practice of independent verification of savings (i.e., to verify installation of measures, or the V part of M&V) versus the development of independent certification of M&V reports and supporting information in conjunction with issuance of ERCs under state compliance plans and reporting. While such persons or entities (independent verifiers vs certifiers) may be the same person or entity, the processes, which may overlap to some extent, are indeed different, and we recommend EPA clarify this to avoid confusion.

We further recommend that substantive involvement of a broad range of public and private stakeholders within the evaluation process should be a cornerstone of ensuring an independent evaluation process.

3. Transmission and Distribution (T&D) Savings Adders

EPA proposes to use the smaller of 6 percent or the calculated statewide annual average T&D loss rate (expressed as a percentage) calculated using the most recent data published by the U.S. EIA State Electricity Profile (state average). We recommend that in the case of utility-sponsored efficiency programs, utilities use their own T&D savings adders instead, as they routinely do for reporting EE savings to their state commissions. In addition, states and utilities should be allowed and encouraged to use different T&D savings adders for different types of EE programs because there can be significant differences across program types; e.g., between programs targeted to residential customers and those targeted to higher voltage customers. State-average T&D loss values should be used for policies or programs that are statewide in scope, such as state building energy codes.

E. The Role of EE and EM&V in the Federal Plan

As EPA considers developing a final federal plan that is mass-based and/or rate-based, one consideration is that the advantage of the federal plan being mass-based is that it will be easier to implement for EPA. [38] Also, if a substantial majority of states use the mass-based approach, taking the same approach in federal plans could lower the cost of compliance for states by providing opportunities to find cheaper emission reductions in a larger market for mass-based emissions allowances than for rate-based ERCs. Under a mass-based plan EE savings can contribute to compliance without explicit EM&V studies because they reduce the tons of CO2

[37] MEEA and NEEA do not take a position on the Federal Plan being mass-based or rate-based. NRDC will be commenting separately on EM&V in the Federal Plan

emitted at power plants. This creates an opportunity for EE efforts to move ahead in states where certain providers may resist implementing measures to comply with federal regulations for political reasons.

However, we recommend that the federal plan make abundantly clear that EE programs and policies are both allowed and encouraged. Many of our groups will be commenting separately on how a federal plan can encourage energy efficiency.

While there are advantages for making the federal plan mass-based, if EPA chooses a rate-based federal plan, then owners of Effected Generating Units (EGUs) should be allowed to acquire ERCs from others and should also be allowed to request that EE ERCs be issued for in-state programs they evaluate (these could be programs they operate or could be operated by others). Such evaluations shall follow the EM&V guidelines, including protections against double-counting of savings, and be certified by the registry discussed above or by a certified evaluation contractor paid for by the EGU owner or their agent.

EPA should establish criteria and a process to certify evaluation contractors to conduct and/or certify EE evaluation results in states subject to a federal plan. Such contractors could potentially also play a role in states that develop a state plan.

F. EM&V in the Clean Energy Incentive Program (CEIP)[39]

In general, we believe the EM&V guidance should apply to CEIP since early action credits earned through the CEIP will have the same value as credits earned after 2022. However, we note that there are additional complications running programs and conducting evaluations in low-income communities. This is particularly the case for non-utility-ratepayer programs where there is often inexperience and unfamiliarity with the EM&V approaches discussed in the draft guidance. Also, CEIP evaluation will generally happen sooner than other evaluations under the CPP and some program operators will still be getting up to speed, particularly those who are more expert in low-income community issues than in evaluation. Given these challenges, we recommend that EPA specifically provide additional flexibility in applying the EM&V guidance to the CEIP. The goal should be for program implementers to follow the EM&V guidance as reasonably possible, to allow for flexibility as needed, and to encourage improvements over time.

CONCLUSION

The Joint EE Stakeholders appreciate this opportunity to comment on EPA's proposed EM&V Guidance, and are prepared to assist EPA with its implementation of the Guidance to ensure the effective and sustainable implementation of state compliance plans with regard to the inclusion of energy efficiency.

[39] NEEA does not take a position on the CEIP section.