

January 21, 2016

VIA EMAIL - emvinput@epa.gov
Environmental Protection Agency

Re: Joint Energy Efficiency (EE) Stakeholder Comments in Response to EPA's Invitation for Public Comment on the Draft EM&V Guidance - and recommendations for how it can be improved for the purpose of implementing the applicable Clean Power Plan (CPP) requirements

Dear Administrator McCarthy:

These joint comments are provided to the U.S. Environmental Protection Agency (EPA) in response to EPA's requests for comments on its draft EM&V Guidance for Demand-side Energy Efficiency ('the Guidance'.) 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 to EPA under docket EPA-HQ-OAR-2015-0199 relative to the proposed CPP federal plan requirements and model trading rules (MTR), as these comments make recommendations on EM&V for EE in the federal plan and specific sections of the model trading rules. Questions regarding these comments herein should be directed to: Julie Michals at NEEP (jmichals@NEEP.org) or Steven Nadel at ACEEE (snadel@aceee.org).

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 energy efficiency (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 CO₂ 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 riders³, 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.

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

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

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 recommend⁵ that EPA clarify that in most cases, when a program is evaluated per the EM&V guidance⁶ 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 year⁷;
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.

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.

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 two 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.

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 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

⁸ See https://www4.eere.energy.gov/seeaction/sites/default/files/pdfs/emv_ee_program_impact_guide_1.pdf.

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.

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.

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

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 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 Designs¹¹ 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.

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

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 or control group. See the SEE Action guidance on EM&V for Residential-Based EE Programs at https://www4.eere.energy.gov/seeaction/system/files/documents/emv_behaviorbased_eeprograms.pdf

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 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

¹² See <http://ma-eeac.org/wordpress/wp-content/uploads/Top-down-Modeling-Methods-Study-Final-Report.pdf>

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

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

¹³ Horowitz, Marvin. 2011. *Macro Consumption Metrics White Paper*. CALMAC. http://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. <http://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. <http://aceee.org/research-report/e12c> .

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 published¹⁶ 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.

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

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 Gilileo et al. 2015. *The 2015 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. See <http://aceee.org/research-report/u1509>

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 <https://eere-exchange.energy.gov/FileContent.aspx?FileID=e6fd3f56-d6cc-4db3-8d26-6b52c4e9c27a>.

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 estimation²⁰ (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 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 gross²² 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

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.

²¹ <http://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 https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

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.
 - 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/ESCO's (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

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.

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 '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

²⁶ U.S. DOE. 2012. See http://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 <http://neea.org/docs/default-source/reports/neea-industrial-initiatives--market-progress-evaluation-report-8.pdf?sfvrsn=10>.

demand response policy arenas,²⁸ and since 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

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 <http://eetd.lbl.gov/sites/all/files/lbnl-62728.pdf>

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

³⁰ See *Changing EM&V Paradigm Report* published by the Regional EM&V Forum (December 2015) at <http://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. <http://aceee.org/research-report/ie1503>.

³² See <http://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 providing study results in a comparable format. These forms can help states streamline EM&V

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.

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 Guidelines³⁵ 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.
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.

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 http://www.energydataweb.com/cpucFiles/pdaDocs/1399/IESR_Guidelines_Memo_FINAL_11_30_2015.pdf

³⁶ See <https://emp.lbl.gov/publications/flexible-and-consistent-reporting>.

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."

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.

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

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 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.

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

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.

Sincerely,

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