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January 17, 2020

By Hand Delivery and Electronic Mail

Honorable Aida Camacho-Welch, Secretary
NJ Board of Public Utilities
44 South Clinton Avenue, 9th Floor
P.O. Box 350
Trenton, NJ 08625-0350

**Re: New Jersey Energy Efficiency Transition
Stakeholder Comments – Evaluation, Measurement & Verification**

Dear Secretary Camacho-Welch:

Please accept for filing the enclosed original and ten (10) copies of comments being submitted on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel") in connection with the above-referenced matter. Copies of Rate Counsel's comments are being provided to all parties on the service list by electronic mail and hard copies will be provided upon request to our office.

We are enclosing one additional copy of the comments. **Please stamp and date the extra copy as "filed" and return to our courier.**

Honorable Aida Camacho-Welch, Secretary

January 17, 2020


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Thank you for our consideration and attention to this matter.

Respectfully submitted,

STEFANIE A. BRAND
Director, Division of Rate Counsel

By:



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Enclosure

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Clean Energy Act
New Jersey Energy Efficiency Transition
Stakeholder Process
Energy Efficiency Stakeholder Meeting – Evaluation, Measurement and Verification
BPU Docket No.: Undocketed Matter

Comments of the Division of Rate Counsel

January 17, 2020

Introduction

As part of the process to implement the Clean Energy Act¹, the Staff (“Staff”) of the Board of Public Utilities (“Board”, “BPU”) convened a Stakeholder Meeting on December 18, 2019 and invited stakeholders to comment on the subject of Evaluation, Measurement and Verification (“EM&V”, or “M&V”) for energy efficiency (“EE”) programs in New Jersey.

The within comments are being submitted by the New Jersey Division of Rate Counsel (“Rate Counsel”) pursuant to the Notice circulated on November 27, 2019 (“Notice”), and the subsequent Request for Comments dated January 9, 2020 (“RFC”) which included four sets of questions intended to further engage discussion by stakeholders. Each set of questions is addressed below, following Rate Counsel’s general comments.

General Comments

While the within comments largely consist of addressing the questions posed by the OCE, at the outset several overarching principles to guide EM&V activities must be considered. The first principle is affordability. In evaluating EE and Demand Reduction (“DR”) programs, customer bill impacts and affordability must be considered, both for residential and commercial customers. The concept of affordability is particularly important in the context of various

¹ P.L. 2018, c. 16 (C.48:3-87.3-87.7) (“Clean Energy Act” or “CEA”).

ongoing utility infrastructure and renewable energy initiatives which also add to customers' utility bills.

The next principle is equity. Ideally, all utility customers should be able to participate in and benefit from EE and DR programs. Monetary bill reduction benefits should not flow to a few fortunate customers at the expense of other ratepayers who are unable to participate in EE and DR programs. The CEA recognizes the concept of equity. Specifically, the CEA requires utilities to assess the ability of all ratepayers to participate in programs through demographic analyses:

Each electric public utility and gas public utility shall conduct a demographic analysis as part of the stakeholder process to determine if all of its customers are able to participate fully in implementing energy efficiency measures, to identify market barriers that prevent such participation, and to make recommendations for measures to overcome such barriers. The public utility shall be entitled to full and timely recovery of the costs associated with this analysis. [N.J.S.A. 48:3-87.9(f)(2) *emphasis added*]

Demographic analyses should be an essential part of the evaluation process, in addition to conventional benefit-cost analyses ("BCA").

Another important principle is the use of reasoned judgment in evaluation. The Board should not rely on any single or primary benefit cost analysis in its evaluation of EE and DR programs. The Board should recognize the strengths and weaknesses of each benefit cost evaluation methodology. More importantly, the Board must use its reasoned judgment in its evaluation of the worth of EE and DR programs, relying on public policy considerations such as affordability and equity, in addition to numerical analyses. Additionally, the evaluation process should be ongoing, to inform both the Board's review of proposed EE and DR programs as well as to provide the feedback needed to modify and improve existing programs. Further, the evaluation process should extend not to just to the EE and DR program measures themselves, but

the process of implementing the programs, including customer enrollment and other program implementation activities.

Finally, the Board should require a robust M&V process, to ensure that the projected and claimed energy savings are, in fact, achieved. Adequate funding for M&V activities is essential. And a degree of independence for M&V activities should be established to credibly verify the claimed energy savings goals are met, particularly when energy savings are a decisive factor in assessing utility incentives and penalties under the CEA.

Question Set 1

a. What types of evaluations and studies (BCA, baseline, process, impact) are necessary, in what cadence and frequency?

The CEA provides some basic guidance regarding the frequency and scope of the evaluations and studies. For example, the CEA requires that utilities file EM&V strategies with their EE and DR program filings.² Further, the CEA requires the Board to review the energy savings targets for each utility every three years.³ This energy savings target review should also include a review of Quantitative Performance Indicators (“QPI”) and the QPI components, such as potential and baseline studies, customer class mix, etc. Participation rates and demographic analyses should also be conducted at that time. As discussed below, evaluation studies (BCA, baseline, projected impact) should be conducted prior to program approval, as well as part of the three-year review (BCA, baseline, process, impact). The Board should also assert its authority to require any such studies, as needed at any time, for good cause.

² N.J.S.A. 48:3-87.9(d)(3).

³ N.J.S.A. 48:3-87.9(b).

Evaluation, measurement, and verification assesses the performance of energy efficiency programs to ensure that (a) program impacts are accurate and credible for meeting required targets for state and/or utility energy efficiency programs; (b) programs use ratepayer funding judiciously by ensuring programs are cost-effective; and (c) programs identify and address areas for improvement in program design in order to overcome program barriers, increase customer participation, and improve program achievements (e.g., energy and peak savings, emissions savings).⁴ To meet these objectives, program administrators should arrange for a third-party evaluator to conduct the following evaluations and studies: avoided cost analysis, cost-effectiveness analysis, impact evaluation (including net-to-gross studies and measure-life studies), process evaluation, baseline and market characterization assessment, incremental cost assessment, and potential assessment.

Among these studies, impact evaluation studies should start prior to or during the implementation of a program cycle. Evaluation planning should ideally begin prior to program implementation when programs are being designed so that the program budget, schedule, and resources can incorporate evaluation requirements. In fact, the CEA requires that utilities file EM&V strategies with their program approval petitions.⁵ This will also help evaluation activities support the success of the programs. Further, early planning of evaluation activities helps ensure that the data collection process will start once implementation begins.⁶ As shown in FIGURE 1,

⁴ Takahashi et al. (2016). Starting Energy Efficiency Off on the Right Foot: Regulatory Policies to Support Successful Program Planning and Design, Prepared for Island Regulatory & Appeals Commission, Prince Edward Island, p. 4.

⁵ N.J.S.A. 48:3-87.9(d)(3).

⁶ Schiller, Steve (2012). "Energy Efficiency Program Impact Evaluation Guide." State & Local Energy Efficiency Action Network, p. 8-1, Available at https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf.

impact evaluation activities prior to program launch include evaluation goal setting, budgets, schedule, reporting expectations, and preparing preliminary evaluation plans.

FIGURE 1. Program implementation cycle with high-level evaluation activities⁷

TIMELINE – Stages of Development for EE Programs and E M&V Processes:

- | | |
|-----------------|---|
| Stage 1 | A. EE Program Activity – program goal setting.
B. E M&V Evaluation Activity – set evaluation goals, schedule, budgets, and reporting expectations. |
| Stage 2. | A. EE Program Activity – program design.
B. E M&V Evaluation Activity – prepare preliminary evaluation plan. |
| Stage 3. | A. EE Program Activity – program launch.
B. E M&V Evaluation Activity – prepare detailed evaluation plan and collect baseline data as needed. |
| Stage 4. | A. EE Program Activity – implement evaluation.
B. E M&V Evaluation Activity – implement evaluation. |

FEEDBACK MECHANISM : the results of the E M&V evaluations in Stage 4 may be used to develop future EE programs and modify current EE programs.

Program administrators should engage in program activities 1 to 3 as shown in FIGURE 1 for every program. However, if the evaluation budget is limited, program administrators may not be able to conduct evaluation studies for every program for every program cycle.

Similarly, planning for process evaluation should begin prior to program implementation. A best practice is to start process evaluations when a program concept is being developed, as part of the research support for the program, along with market research.⁸

In terms of timing, process evaluation differs from impact evaluation in that it can be operated continuously as part of a continuous improvement effort and should be implemented

⁷ Adapted from Source: Schiller, Steve (2012). State and Local Energy Efficiency Action Network.

⁸ See Peters, J. S. (2007). Lessons learned after 30 years of process evaluation. Retrieved from http://www.bpa.gov/EE/Utility/research-archive/Documents/30_Yrs_of_Evaluation-102507-2.pdf

when existing programs have significant program design changes (e.g., incentive design or levels). The latter is to assess the effectiveness of new program changes.

Other studies do not need to follow the schedules for the impact and process evaluation studies as described above. These studies are most helpful when they are conducted prior to preparing energy efficiency plans. Among the other evaluation studies, avoided cost studies should be conducted or updated prior to conducting benefit-cost and energy efficiency potential studies because these studies require key outputs from the avoided cost studies. Finally, baseline and market characterization assessment studies should be conducted or updated (when they are outdated) prior to conducting impact evaluation and potential studies because baseline and market characterization studies set baselines against which program impacts are assessed. As discussed above, baseline and potential studies are part of the initial QPI and QPI review processes under the CEA.⁹

In addition, New Jersey's Protocols to Measure Resource Savings should be updated annually to reflect the latest information available from impact evaluation and other relevant studies, such as baseline assessment.

b. What models do we see for who conducts, reviews, and approves each of those?

All EM&V studies should be conducted by independent vendors in order to ensure that such studies are unbiased and robust. In addition, it is critical that vendor selection is competitive and transparent. The selection should ideally be carried out with assistance from the Board or an independent entity or individual to further ensure the integrity of evaluation studies. Finally, evaluation studies and evaluation plans should be include in utility program filings, together with all supporting information, for review by the Board and other parties. Entities who

⁹ See N.J.S.A. 48:3-87.9(a),(b) and (c).

oversee studies should make sure that evaluation studies are supported with data reviewable by the Board and stakeholders, and that plans reflect stakeholder feedback.

c. How can stakeholders provide technical or on-the-ground expertise into the process?

The Clean Energy Act established the independent advisory group (“IAG”) to study and provide recommendations for improvement of the evaluation, measurement, and verification process for energy efficiency and peak demand reduction programs.¹⁰ The IAG can also provide general feed-back on the EM&V process. In essence, the IAG operates at a limited higher-level advisory role rather than at “ground-level.” Once EM&V proposals are filed by utilities, parties can review the specific plans in detail. Further, in the future the Board can establish stakeholder processes such as the instant proceeding, as needed, to address EM&V issues and policy questions as they arise.

d. What model(s) for program evaluators should New Jersey consider?

Please see the responses above.

Question Set 2

a. How should the EM&V process intersect with filing requirements? What types of information are needed when, and from whom?

Whenever the utilities and OCE file program plans for new program cycles, they should also file EM&V plans for the program cycle, as required by the CEA.¹¹ For example, in its 2012 report titled “Energy Efficiency Program Impact Evaluation Guide,” the State and Local Energy

¹⁰ N.J.S.A. 48:3-87.9(f)(1).

¹¹ N.J.S.A. 48:3-87.9(d)(3).

Efficiency Action Network (“SEE Action”) describes what needs to be included in an EM&V planning document as follows:

The evaluation planning documents should clearly present the evaluation efforts and details of the actions to be undertaken during the evaluation activity, as well as consideration of regulatory (reporting) requirements. A plan is a stand-alone decision document, meaning it must contain the information the evaluator and others need to understand what is to be undertaken, why, when, and how.¹²

This approach seems reasonable. While the SEE Action report focuses on impact evaluation studies, this approach may be applicable to other types of EM&V activity.

b. What is needed in this transition period (through launch of new programs) and the long term (~5-year goal and beyond)?

During the transition period (through the launch of new programs), the OCE and the New Jersey utilities will lay the groundwork for the program administration framework currently under consideration by the Board. This framework will likely require the CEP and utility program administrators to work in a more integrated fashion, including working collaboratively to conduct evaluation studies and to update the statewide savings protocols. The evaluation process should be flexible to accommodate various arrangements by the different program administrators.

A key foundation of the evaluation framework for the Board is to establish an independent advisory group to oversee the EM&V process, as required by the CEA.¹³ The CEA directs the Board to establish a stakeholder process to evaluate energy usage and peak reduction potential, quantitative performance indicators, and the process for EM&V activities. The CEA also directs the Board to establish an IAG as part of this stakeholder process.

¹² SEE Action. 2012. Energy Efficiency Program Impact Evaluation Guide, p. 8-13.

¹³ N.J.S.A. 48:3-87.9(f)(1).

Furthermore, Rate Counsel recommends that the Board create a statewide EM&V coordinator to coordinate key EM&V activities involving the IAG, the third-party evaluators, the utilities, and the OCE. This coordinator role would serve to ensure statewide consistency of high-level EM&V decisions (e.g., methodology, confidence levels, assumptions, and inputs).

Ideally, once the IAG and the EM&V coordinator are established and in a position to do so, they can take a fresh look at the most recent CEP evaluation plan (issued in 2017) and consider which studies need to be conducted and in what timeframes. This activity will create the first statewide evaluation plan for the new program administrator framework. There are some evaluation studies that could be conducted by the OCE that can be applicable to any type of program. For example, the 2017 evaluation plan proposed conducting an energy efficiency baseline study in 2018.¹⁴ Progress on the baseline study should be monitored. A baseline study has implications for many types of programs. Thus, the OCE should this study should be completed as soon as possible. Further, following the CEP's regular schedule, the Savings Protocols document should be updated annually. Finally, avoided costs may need to be updated to be used for assessing the benefits of new programs that will be proposed by the CEP and the utilities. The IAG and the EM&V coordinator have a critical role in ensuring that all program administrators use the same key assumptions and avoided costs where applicable.

When the utilities file program implementation plans, the CEA requires each utility to file an EM&V plan.¹⁵ Rate Counsel strongly recommends that the CEP also follow this directive. It is imperative for the CEP to follow the same standards required of the utilities, because this will promote consistency among different entities and across the State. When the utilities or the CEP

¹⁴ NJ CEP. 2017. Evaluation and Research Plan – Fiscal Year 2017 (July 1, 2016 to June 30, 2017): New Jersey's Clean Energy Program Energy Efficiency and Renewable Energy Programs.

¹⁵ N.J.S.A. 48:3-87.9(d)(3).

file their implementation and EM&V plans, evaluation activities should start immediately. Planning and preparation for impact evaluation and process evaluation studies should begin prior to program implementation as we described in our comments under Question 1 above. This process occurs at the end of the transition period (through the launch of new programs). Further, new program filings should include a projected benefit-cost assessment that meets the cost-effectiveness guides promulgated in the CEA.¹⁶

In the long-term (after the launch of new programs), the CEA requires each utility to “file an annual petition with the board to demonstrate compliance with the energy efficiency and peak demand reduction programs, compliance with the targets established pursuant to the quantitative performance indicators, and for cost recovery of the programs, including any performance incentives or penalties, pursuant to section 13 of P.L.2007, c.340 (C.48:3-98.1).”¹⁷ Rate Counsel recommends that the utilities provide updated benefit-cost assessments along with this annual compliance filing. Rate Counsel further recommends that CEP also file benefit-cost assessments annually.

Lastly, through the transition period and in the long-term period, the IAG and the EM&V coordinator should meet periodically to oversee and manage evaluation studies for NJCEP and the utilities. They also need to develop annual statewide evaluation plans each year.

c. Should New Jersey evolve towards a unified framework for all distributed energy resources?

New Jersey policymakers should examine the possibility of expanding energy efficiency and demand reduction programs to include distributed energy resources (“DERs”) such as batteries, behind-the-meter solar systems, and electric vehicles. The CEA requires the Board to

¹⁶ N.J.S.A. 48:3-87.9(d)(2).

¹⁷ N.J.S.A. 48:3-87.9(e)(1).

conduct a study on energy storage and distributed energy resources and establishes specific goals for deployment of battery storage.¹⁸ The CEA also establishes “the goal of 600 megawatts of energy storage by 2021 and 2,000 megawatts of energy storage by 2030.”¹⁹ In order to support the CEA’s energy savings and demand reduction goals, New Jersey should work to develop a unified approach which may include a role for distributed energy resources.

Question Set 3

a. Should New Jersey develop a primary cost test associated with key policy initiatives, e.g., following the Resource Value Framework (National Standard Practice Manual), designate one of the five standard tests as the primary test, or employ another approach? What approach is recommended?

Rate Counsel supports the use of multiple tests to assess program impacts from several perspectives and does not find it useful to determine and rely on a single primary cost test. Moreover, ratepayer bill impacts must be a part of all evaluation studies.

With respect to benefit cost analyses, Rate Counsel continues to support the use of all five standard tests set forth in the California Standard Practice Manual (“CSPM”), namely the Utility Cost Test (“UCT”), Total Resource Cost (“TRC”) test, Societal Cost Test (“SCT”), Participant Cost Test (“PCT”), and Ratepayer Impact Measurement (“RIM”) Test. Each test provides valuable information from different perspectives. For example, the UCT provides information about how programs affect a utility’s revenue requirements, and therefore indicates the extent to which energy efficiency will reduce total costs and average customer bills. The TRC provides additional information regarding impacts on efficiency program participants. The SCT provides additional information regarding environmental and economic development benefits, which the CEA requires be included in a benefit-cost test. Rate Counsel supports the

¹⁸ N.J.S.A. 48:3-87.8 (a),(c).

¹⁹ N.J.S.A. 48:3-87.8 (d).

use of the RIM test, however, all evaluation studies should also include bill impact analyses to assess the impact of the programs on the utility bills for customers, particularly residential customers at various levels of usage. Bill impact analyses are necessary to assess the affordability of utility bills.

Therefore, Rate Counsel strongly recommends that all program administrators in the state be required to conduct long-term rate, bill, and participation impact studies²⁰ Specifically, rate impacts should be measured in terms of cents per kWh for electricity and dollars per therm for natural gas as well as percentage changes in rates due to energy efficiency programs. Bill impacts should be measured in terms of dollar impacts per month and percentage changes in monthly bills due to energy efficiency programs. Presenting the long-term rate impacts in this way allows program administrators and other stakeholders to fully understand any potential rate impacts.

Further, Rate Counsel considers it critical to analyze cumulative efficiency program participation rates to address equity and rate impact concerns regarding energy efficiency programs. This analysis will tell us how widespread energy efficiency programs are likely to be, and to what extent ratepayers are mitigating potential rate increases with reduced energy bills due to energy efficiency measures. It would help ensure that there is equity whereby all ratepayers have the opportunity to participate and save on their energy bills.

With respect to the Resource Value Framework (“RVF”) found in the National Standards Practice Manual (“NSPM”), which seeks to define benefits and costs in the context of policy objectives, that approach is not effective as a “primary test” since it fails to address a core function of utility regulators, i.e. ratemaking. Thus, the NSPM should not be used as a primary

²⁰ This is consistent with the recommendations found in Appendix C of the National Standard Practice Manual (“NSPM”).

test, although it could be evaluated along with the other tests discussed above. The Board must have all the tools available to review EE and DR programs, which include a full range of BCA tests and affordability analyses, in order to assess and implement its policy goals. Further, if the Board decides to also include the NSPM test as one of its enumerated BCA tests, the RVF factors should include, at a minimum, benefits and costs associated with low income customers, including estimates of energy burdens and program participation for various customer classes and demographic groups. Rate Counsel recommends that any such new test should only be considered in combination with the traditional cost-effectiveness tests and other analyses.

b. What are the costs and benefits that you would recommend for consideration in a single benefit-cost test?

- i. Are there indirect or non-energy related costs or benefits that should be considered?***
- ii. If so, how can they be estimated?***

As discussed above, Rate Counsel does not support the use of a single benefit-cost test. The inherent simplification of a single benefit cost test is its weakness. The five recognized “standard” BCAs found in the California Standard Practice Manual have some weaknesses as set forth in the CSPM, but generally provide several perspectives for evaluating EE and DR programs, as discussed in the response to the prior question. Consideration of several analyses provides a multi-perspective approach, where a reasoned balancing of perspectives is required. Furthermore, affordability must always be considered. Finally, no single test or group of BCA tests can replace the need for reasoned judgement of the Board and stakeholders in assessing the merits of EE and DR programs.

Utility avoided costs, environmental health savings and so forth are among the societal costs factored into the CSPM BCA tests. However, other cost and benefits need to be examined.

For example, program participation rates (by customer class and demographics), bill impacts, energy bill burdens, and other factors need to be considered in weighting and evaluating the costs and benefits of EE and DR programs. In fact, the CEA requires an analysis of customer participation in EE and DR programs.²¹

Question Set 4

a. What are the most important factors to address in measurement and verification of energy savings?

Measurement and verification activities are critically important in the context of the CEA. The measurement and verification of energy savings primarily constitutes an impact evaluation, assessing the actual amount of energy savings achieved in relation to the CEA's energy savings requirements. Further, energy savings are a key determinant of utility incentives and penalties under the CEA. The goal of an impact evaluation is to reliably establish the energy savings, peak demand savings and non-energy benefits that result from a program.

There are a number of factors that must be addressed in impact evaluations. Some of these factors that must be broadly addressed in any evaluation (not limited to impact evaluation only) include the following:

1. The evaluation should be non-biased and independent.
2. The assumptions, inputs, calculations, and methodologies should be transparent.
3. The activities should apply an appropriate level of rigor based on the best practices and evaluation priorities.
4. Evaluation activities should be planned in a way that prioritizes the high value activities.

When conducting an impact evaluation for a program, the specific goals, objectives, and research questions should be clearly defined so that the impact evaluation can be conducted in a

²¹ N.J.S.A. 48:3-87.9(f)(2).

way that supports the program goals and objectives. This allows the impact evaluation activities to be results-focused with the intention of improving program planning and program delivery. In addition, especially when programs are under development or in the early stage of implementation, reporting standards and the frequency of reporting of different metrics must be clearly defined for each program. The key performance metrics that are to be measured and produced as outputs to the evaluation activities should be clearly listed.

Uniformity and consistency in how the evaluation is conducted and how the reporting is done are crucial to the success of any energy efficiency plan. Metrics, when defined upfront, allow for such uniformity and consistency across programs and across different phases/cycles of the energy efficiency plans. In the context of impact evaluations, the results must be defined at measure level, program level, sector levels (business, commercial, residential etc.) and at a portfolio level. Therefore the impact evaluation needs to be done in a way that allows for reporting the results for these different levels.

Depending on the nature of the program, there are also a number of technical aspects such as inputs, assumptions, and methodologies that are important factors to address at the outset of an impact evaluation. These details could include specifics on the energy savings protocols to be used, any necessary savings protocols development activities, approaches for evaluating the gross and net energy savings and any associated key assumptions in these calculations (e.g., free ridership and spillover). Also important to address are approaches for evaluating non-energy benefits associated with the program. Finally, the results of an impact evaluation must always clearly state the overall certainty of the savings estimates and any bias associated with the savings.

i. Should programs be evaluated based on gross or net savings?

Energy efficiency programs should be evaluated based on net savings. Net savings refer to energy savings that are attributable to an energy efficiency program. Net savings typically take into account (and exclude) free riders who would have implemented the program measure or practice in the absence of the program. Net savings should also incorporate any spillover effects. Spillover effects are savings impacts caused by the presence of an energy efficiency program beyond the program-related savings of the participants and without financial or technical assistance from the program. Net savings are useful outputs of energy efficiency programs because they indicate the effectiveness of the programs. For example, when net savings are substantially low compared to gross savings and the net-to-gross savings ratio is low, program administrators need to examine the cause of the poor program performance through process evaluation. This can help identify ways to improve program designs in order to reduce free riders and improve the effectiveness of the programs.

ii. For which measures are the use of deemed (assumed) savings appropriate, and which measures should be tested to verify actual savings?

Deemed savings or deemed savings calculations are suitable for projects that are not expected to have significant variation in the savings. Assessment of actual energy usage and savings are required for measuring impacts for programs that involve relatively complex retrofits which are subject to more variation in savings. This approach - called a project-specific M&V approach - is generally applied to only a sample of projects in a program. It is often used when other approaches are not applicable (e.g., when no deemed savings exist) or when per project savings are needed.²² The project-specific M&V approach uses one or more methods that can

²² Schiller, Steve. 2012. pp. 4-12.

involve measurement, engineering calculations, and billing regression analyses to verify actual savings. These different methods are described in the International Performance Measurement and Verification Protocols (“IPMVP”). The M&V approach also typically accompanies field activities dedicated to collecting site information. Such information can include equipment counts, observations of field conditions, building occupant or operator interviews, measurements of parameters, and metering and monitoring.²³ Information and data collected through field activities are essential for measuring and verifying savings. Generally, more complex EE and DR measures require more careful and comprehensive M&V processes, as compared to simple measures such as lighting which are amenable to deemed savings garnered from protocols and other appropriate guide manuals.

b. How should advanced M&V (automated data processing/increased data granulation) be integrated into EM&V?

Where available, Advanced M&V (also known as M&V 2.0) might provide additional data to inform studies of energy savings.²⁴ Advanced M&V has some similarity to traditional billing analysis. Billing analysis uses an adjusted baseline, developed using actual metered consumption data in the pre-program period, to estimate what future building energy use would be absent the energy efficiency measure. Advanced M&V also does this analysis, but in a more dynamic and automated manner. Advanced M&V can collect and process data in real-time and can produce “dynamic savings estimates that are customized based on automated data analytics

²³ Schiller, Steve. 2012. pp. 4-12.

²⁴ Advanced M&V uses emerging information and communications technologies (“ICT”) to automate the process of collecting and processing actual energy data in real-time to produce building energy profiles, estimate savings potential, or estimate building energy savings in near real-time.²⁴ ICT relevant to Advanced M&V includes smart meters, smart thermostats and devices, non-intrusive load metering (“NILM”) devices, building automation systems (“BAS”), and building energy management systems (“BEMS”).

for each potential customer.”²⁵ Thus, it can more easily develop baseline consumption and estimate savings in numerous buildings in near real-time. However, deploying advanced M&V is understandably very costly relative to the value of the energy savings data except, perhaps, for very large customers. Moreover, Advanced M&V should not be used as a driver for uneconomical automated metering infrastructure (“AMI”).

i. When should it be incorporated?

As discussed above, Advanced M&V has various applications. A critically important factor in the deployment of Advanced M&V is cost. The timing of the applications is different by application. In each instance, the cost of deploying Advanced M&V must be measured against the value of the acquired data.

ii. What are best practices related to accuracy/confidence/reporting?

Applications of Advanced M&V are very limited at this point. Therefore, Rate Counsel is not aware of any comprehensive best practices on Advanced M&V based on actual experience with wide-ranging deployment of such systems.

²⁵ See VEIC. 2018. A Guidebook to Adoption of M&V 2.0., p. 8.