Industrial Strategic Energy Management Impact Evaluation:

BPA Response Memo

February, 2017

KEY RECOMMENDATIONS FOR EM PROGRAM MEASUREMENT AND VERIFICATION (M&V)

The evaluation team makes the following recommendations for performing M&V of the EM savings:

The Energy Performance Tracking (EPT) Team should continue using statistical analysis of facility consumption to estimate savings. Specifically, the team should employ the forecast savings estimation approach on a site-specific basis. This approach is widely accepted, familiar to program participants, and expected to produce accurate savings estimates.

BPA Response: The EPT team agrees and intends to continue this practice.

The EPT team should continue documenting non-routine adjustments to support model specification or re-baselining and to inform evaluation efforts.

BPA Response: The EPT team agrees and intends to continue this practice.

The EPT team should continue to collect interval data when possible, rather than monthly billing data, since facilities with higher frequency energy model data (i.e., daily or weekly rather than monthly) had a smaller regression coefficient of variation.

BPA Response: The EPT team agrees and intends to continue this practice.

The EPT team should continue to report increases in consumption in the Monitoring, Targeting and Reporting (MT&R) model workbooks and to document the application of any non-routine adjustments.

BPA Response: The EPT team will continue its practice of documenting increases in energy consumption, when calculated by the MT&R model.

The EPT team should have discretion about whether to calculate and report uncertainty of the MT&R facility savings estimates. Estimation of savings uncertainty might provide some value to the program team, but it is not essential for M&V.

BPA Response: The EPT team agrees and intends to report the uncertainty of the MT&R facility savings estimates where appropriate or useful for the program team.

The EPT team should routinely test for the statistical significance of weather variables in the MT&R energy consumption regression model

and include these variables in the model if they are significant.

BPA Response: Since the evaluation cohort, the program has updated its practices and this has been integrated into newer processes. The EPT team will update the MT&R guidelines with this practice.

BPA should attempt to improve the accuracy of the reported SEM savings by recording negative SEM savings estimates or making program-level adjustments to savings.

BPA Response: BPA will examine this recommendation and review our policies on reporting. We also will consider the impact of BPA's new rebaselining policies for reporting toward Council targets to ensure impacts of EM program are appropriately reflected.

The EPT team should review and, if necessary, update guidelines for when it is appropriate to choose a new consumption baseline for a facility. Section 5.0 of BPA's ESI MT&R Reference Guide provides guidance about re-baselining.

BPA Response: The EPT team agrees and intends to review, and if necessary, update the MT&R Reference Guide based on the evaluation findings.

If BPA wants to conduct additional research into specific topics, we recommend the following:

To improve the accuracy of SEM savings estimates in the long run at facilities with custom capital projects, BPA could investigate the persistence of capital project savings.

To understand whether participation in an SEM program increases the number of capital projects implemented, BPA could compare the number of implemented capital projects in participant and non-participant facilities.

To support an assessment of program cost-effectiveness, BPA should collect data on participant facilities' costs of implementing SEM and other fuel savings.

To study the persistence of savings after a facility finishes its engagement with the program, BPA should continue to collect data from participant facilities after engagement ends. Collection of such data would help BPA to better assess the program's long-term value and cost-effectiveness.

BPA Response: BPA will consider the feasibility and value of conducting any of these additional research topics during program development activities.

SEM ADOPTION RECOMMENDATIONS

The evaluation team did not find a relationship between the number of SEM activities adopted and the magnitude of facility energy savings. However, promoting these activities may lead to greater persistence of energy management practices and to sustained energy savings after participants graduate from the program, though this has yet to be demonstrated. We have the following recommendations for BPA to consider:

To further understand the relationship between savings and adoption of specific SEM elements, BPA could conduct the energy management assessment annually to update participants' progress in implementing SEM.

BPA Response: BPA program team will consider the feasibility and value of conducting an assessment of SEM elements annually.

The EPT team should encourage energy teams to schedule regular meetings, at least quarterly. Twenty (of 24) facilities reported using an energy team, but seven of those teams did not meet regularly.

BPA Response: BPA will continue to emphasize best practices for energy team engagement in its SEM curriculum and delivery. The program will assess the need to enhance its materials and methods to address opportunities for continuous improvement.

The EPT team should encourage energy teams to develop methods to engage other employees in efforts to improve energy performance. Nine (of 24) facilities reported not conducting employee engagement activities.

BPA Response: BPA will continue to emphasize Employee Engagement in its SEM curriculum and delivery. The program will assess the need to enhance its materials and methods to address opportunities for continuous improvement.

The EPT team should encourage energy managers or teams to regularly update senior management. All facilities reported sharing energy consumption data within their company, but 10 facilities reported that senior management did not require regular updates. The energy team should review these data at least annually with senior management to highlight accomplishments, so senior management continues to recognize the value of those efforts.

BPA Response: BPA will continue to emphasize the importance of communicating energy performance to senior management in its SEM curriculum and delivery. The program will assess the need to enhance its materials and methods to address opportunities for continuous improvement.

RECOMMENDATIONS FOR FUTURE EVALUATIONS

In summary, the evaluation team offers the following recommendations to BPA for conducting future evaluations:

In general, evaluators can choose from a number of different statistical regression methods to estimate savings. These methods, which are reviewed in Appendix B of the Industrial SEM evaluation report (www.bpa.gov/goto/evaluation), are expected to produce accurate savings estimates. However, in selecting a method, evaluators should consider the potential benefits of aligning their approach with that used by the program.

BPA Response: We agree with the value of aligning the evaluation approach with the program approach as much as possible. In future evaluation designs, we will consider this evaluation's final methodology, as well as newer research efforts for SEM evaluation.

In situations when there was a significant, non-programmatic change to facility operations and energy consumption, one estimation method may produce a more accurate savings estimate than another. Evaluators should consider the relative merits of different savings estimation approaches in these circumstances.

BPA Response: Agreed. See comment above for future evaluation design approach.

Evaluators should consider employing automated variable selection methods in building baseline regression models. These methods provide an objective and cost-efficient way of identifying relevant independent variables, as well as higher-order terms of and interactions between relevant variables.

BPA Response: Agreed. We will consider this issue in future evaluation designs, while also incorporating practical considerations for program data collection of all potential variables for model inclusion.

Although this evaluation has broken new ground in many areas, there are still several topics that BPA or other national evaluators of SEM programs could explore further:

Evaluate the energy savings of the HPEM 3 and HPEM 4 cohorts (which began HPEM in 2012 and 2013, respectively), which were not considered in this evaluation. Such an evaluation would show whether the newest participants achieved savings similar to that of the HPEM 1 and HPEM 2 cohorts.

BPA Response: In future evaluations, we will include more recent participants. Also, we will also undertake an internal effort to review MT&R and reported savings for facilities not included in this evaluation to determine if results of this evaluation are relevant for the whole program population.

Assess the effect of BPA's new policy of establishing a new baseline for participant facilities every two years on savings realization rates.

BPA Response: For future evaluations, we will consider implications of new baselining policies. There may be an opportunity to simulate the effect of the policy change using facilities with more than two years of participation, where the re-baselined model is similar to previously used.

Conduct a process evaluation to understand why HPEM cohorts performed differently and to gain insights about the relationship between savings and implementation of specific SEM activities.

BPA Response: If there is interest by the program team, the evaluation team is willing to undertake process evaluation to understand differences between cohorts and with specific SEM activities.

Estimate the persistence of SEM savings after a facility's engagement with the program ends in order to evaluate program cost-effectiveness.

BPA Response: Evaluation will work with the program team to determine the feasibility of collecting facility data after program participation.

Investigate the feasibility and reliability of evaluating savings for a sample of SEM participants instead of the population.

BPA Response: In future evaluation designs, we will attempt to conduct a representative sample rather evaluate a census of facilities. We hope that there are national research efforts that will support evaluation sampling methodologies for SEM program by that time.

Study the effect of capital project savings uncertainty on the uncertainty of SEM savings estimates.

BPA Response: Due to the cost of this effort, we hope that other national or regional utility evaluations of SEM programs will address this issue.