Energy Trust Commercial Strategic Energy Management Pilot

Evaluation Report 1

Public Version

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September 2013

Executive Summary

This report presents the results of the evaluation of Energy Trust of Oregon's Commercial Strategic Energy Management (SEM) Pilot through 2012. A second report will be prepared to assess the results of the first year for 2013 participants, as well as the persistence of savings and SEM practices for those who participated in 2012. Commercial SEM is a limited program offering designed to deliver comprehensive energy services to selected large customers focused on behavioral and operational changes as well as capital projects. Energy Trust has contracted with two Commercial Technical Service Providers (CTSPs) to deliver integrated energy analysis and training to large commercial customers to achieve operational savings and to help develop long term plans for energy efficiency. The program is currently delivering two approaches to SEM via different contractors: a cohort track and an individual track.

The goal of this evaluation is to ensure that SEM is achieving the projected level of energy savings at a reasonable cost and to provide feedback on program design and implementation. The evaluation is designed to help Energy Trust decide how best to integrate SEM as a standard offering within its commercial sector.

Key findings from this report are summarized below.

- Overall, the SEM approach seems to be applicable to commercial projects, although the correlation between business activities and usage is often more complicated than the relatively straightforward relationship between output and energy usage for industrial customers. In particular, sorting out SEM savings from other observed savings attributable to, for example, retrofit projects, is difficult at best. The more complex or "custom" the planned projects, the more substantial are the barriers to determining SEM-driven savings.

- Based upon the first year results, the cohort approach provided more cost-effective savings by leveraging the technical support offered by the CTSP.

- Despite limitations, regression analysis provides an acceptable approach for estimating overall kWh and therms savings from the numerous operational and behavioral changes that would be expected to result from implementation of SEM in commercial buildings. Concerns include the difficulty of identifying small incremental changes in usage when there are both weather-related and non-weather-related factors influencing energy usage, the relative complexity of the process of estimating savings, and problems estimating annual savings attributable to SEM from limited data. Unfortunately there do not appear to be low-cost alternatives to this method, although SEG's initial efforts to use EnergyStar Portfolio Manager for small sites are promising.

- The departure of individuals with Energy Champion or Executive Sponsor roles during the course of participation created challenges for a few projects. The departure of a single

individual who held both positions appears to have seriously threatened the persistence of savings at another organization.

- Getting buy-in from facilities and operations staff can be difficult, primarily because these functions are notoriously understaffed and over-committed. Several participants in cohort 1 encountered challenges in SEM implementation because the facilities group was not fully committed to their organization's participation in the pilot, perhaps because they feared it would take up far too much of their time.

- An accurate record of the timing and nature of SEM actions is essential for understanding and interpreting the results of the analysis of baseline and post-participation energy usage.

- Use of the Monitoring, Tracking and Reporting (MT&R) tool tends to slip over time, in part because it is a time consuming process whose statistical foundations are not always understood by participants.

- The development of a formal Strategic Energy Plan appeared to lag behind other aspects of SEM implementation, both because of the formal approval process required within each organization and because – in the cohort approach – plan development comes relatively later in the process when participants are already tasked with implementing numerous other changes.

- The exchange of ideas between facility managers from different organizations (or, to a lesser extent, managers of geographically dispersed buildings within a single organization) was one of the most highly valued features of the SEM workshops and meetings.

Recommendations

- Commercial SEM is suitable for inclusion in the Existing Buildings program. While both the cohort and individual approaches are effective in helping organizations improve the efficiency of their energy management, the individual approach must be modified to reduce the cost of savings – perhaps by limiting this approach to organizations with a minimum number of facilities where energy management strategies can be cost-effectively replicated.

- For all types of buildings, consider using more data points to establish the pre-participation baseline. At a basic level, this would mean extending the pre-participation analysis period to more than one year, assuming the data were available and there were no known other exogenous changes such as major projects in that period. Going forward, as more smart meters and the associated analysis software are deployed in commercial buildings participating in the pilot, it may be possible to use daily or weekly data to

establish the desired relationship. This would improve statistical precision and may also support the use of multivariate models, which would be particularly valuable for facilities subject to both weather- and non-weather-related changes in usage.

- To ensure that seasonal variation in savings from implementation from SEM are accounted for, extrapolation of savings to annual totals should be done with at least 6 months of data. We recognize that the effect of SEM actions on usage may not be fully captured when the analysis period begins too soon after SEM initiation, so we recommend that calculation of savings and associated incentives be deferred until 3-6 months after completion of the first year of SEM engagement. We understand that a "true-up" of savings is scheduled to occur a year after the engagement is completed, but it would be better if initial results more accurately represent the actual savings from SEM participation.

- When SEM-driven actions include changes in run-time time (e.g., hours of lighting operation), the participant or the CTSP could use low cost data loggers to confirm that the selected action has been taken and remains in place several months later. For end uses with a known connected load, this may also facilitate calculation of an engineering estimate of savings as a reality check on the regression results.

- Given the difficulty of linking changes in usage to specific actions, it is important that the variance logs be comprehensive in the operational changes tracked at the time they are implemented so that energy managers have a detailed record to refer to when investigating changes in usage. The variance logs should be regularly updated, including confirmation that previously implemented changes continue in place over time.

- CTSPs should avoid recruiting firms with extensive capital projects or energy services contracts underway shortly before participation or planned during the participation period, particularly if those projects are more complex than simple equipment change-outs.

- While it is impossible to predict whether someone will change positions during the participation period or shortly thereafter, the effect of any individual's departure can be minimized by requiring a separate Energy Champion and Executive Sponsor and making sure that both have at least a working knowledge of all the key aspects of SEM participation.

- Energy Trust should require commitment from facilities staff before enrolling a participant, providing a realistic estimate of the number of hours per month that would need to be devoted to SEM. To make this possible, SEM participants could be asked to log and report (or estimate) the number of hours actually spent on SEM by the Energy Champion, the Executive Sponsor and other staff at various stages of the engagement.

- Hands-on computer training should be focused on the practical aspects of using the monitoring, tracking and reporting (MT&R) tools, and the person responsible for tracking should be required to complete the workshop where this is presented. Absent a dashboard, a simple template for emails should be provided that can be distributed to facilities staff.

- For firms already using Energy Expert or similar tools, data from those tools should be incorporated into the SEM tracking and reporting system.

- SEG should continue to investigate the use of EnergyStar Portfolio Manager as a tool for estimating savings from SEM for small sites.

- Information on how to develop and implement a Strategic Energy Plan should be presented earlier in the workshop sequence and then referred back to as appropriate aspects of the plan are dealt with in subsequent workshops. Also, it may be appropriate to offer an incremental incentive when the participant's organization can prove that it has formally adopted a plan that is approved by the CTSP.

- To encourage the exchange of information, devote some time during each workshop or meeting to allow participants to share their successes and failures. For the one-on-one approach, this feature can best be exploited by working with organizations that have multiple sites; if those are geographically dispersed, use conference calls or web-based meetings to reduce cost while still sharing information.

Following this report, and as part of the same evaluation cycle, there will be a second report after the completion of the second year of the Commercial SEM Pilot, as both the cohort approach and the one-on-one approach are being implemented for a second set of participants. This second report will investigate:

- The persistence of savings for first year participants

- Additional savings from capital projects undertaken as a result of SEM participation

- The participation process and resulting savings for Year 2 participants for both the cohort and individual approaches.

- Overall customer satisfaction with the SEM pilot.

MEMO

Date: October 30, 2013
To: Board of Directors
From: Dan Rubado, Evaluation Project Manager
Kathleen Belkhayat, Commercial Sector Project Manager
Subject: Staff Response to the Commercial Strategic Energy Management Pilot Evaluation Report 1

The Commercial Strategic Energy Management (SEM) Pilot is Energy Trust's first attempt to apply SEM concepts to the commercial sector. The Commercial SEM pilot generated substantial energy savings in its first year (2012), bringing in at around 6 million kWh of electricity and over 126,000 therms of gas. The Pilot's savings are 6% of total electric and 7% of total gas savings for the entire Existing Buildings Program in 2012; a significant contribution for a pilot.

There have not been any major changes since the program's inception in 2011, but there have been several modifications to delivery based on customer feedback and contractor and Energy Trust observations. The Pilot has reordered activities, streamlined its processes, refined the savings calculation methodologies, and created new ways to motivate customers to implement changes. This evaluation report shows that SEM can successfully be applied to the commercial sector to engage customers and produce significant, cost-effective savings. The program is making a number of additional enhancements in response to the evaluation.

The program plans to ensure that the Energy Champion and Executive Sponsor roles are filled by different individuals and that there is additional cross-training on the energy team so that multiple people can carry on SEM. In addition, the program will designate a back-up Energy Champion at each organization and undergo succession planning to ensure that SEM persists even if key employees leave.

Although the evaluator recommended using six months of savings data to project annual energy savings and using data loggers as a check on measure-level savings, the program does not believe the benefits of the additional upfront accuracy are worth the delay or added cost, particularly since the savings are verified one year after the end of the engagement. Currently, the CTSPs lend data loggers to customers to monitor energy use on specific equipment but do

not use the data to create engineering estimates of savings for individual actions. However, the CTSPs are continuing to work with customers to collect comprehensive information on all changes that could impact energy and track these changes in variance logs. Good variance logs will allow the CTSPs to better tie customer actions to changes in energy usage, which will provide some validation of the observed savings.

To reduce costs, the program plans to focus the individual approach on large facilities with high energy use and chain organizations with many comparable facilities where measures can easily be replicated. Prescriptive O&M measures and more prescriptive savings calculations will be used to serve smaller customers and sites in both tracks. The program will also continue to search for simpler, more automated energy tracking tools that provide results in an electronic dashboard, do not require an understanding of regression models or manual input from the customer, and simplify savings quantification for the CTSPs. Such a tool would be extremely useful and could improve the program across the board.

To get greater organizational buy-in and create a foundation for developing a Strategic Energy Plan, a small incentive will be offered to participants that adopt an Energy Policy prior to the end of the engagement. To facilitate this, training about the Energy Policy has been moved to the first workshop. Going forward, the program will also try to quantify the time commitment required of various roles and types of staff, including facilities staff. This information will be shared with customers during recruitment so that management is aware of the commitment required and can better plan for the workload. The program hopes this will translate into additional executive support for staff to spend time on SEM-related activities.