# Helping Energy Managers Excel – Sustaining a vital role in Ontario's Conservation First Framework

*Tom Aagaard, Independent Electricity System Operator*
*Jon Feldman, Independent Electricity System Operator*
*Victoria Gagnon, Independent Electricity System Operator*

## ABSTRACT

Few would argue with the intrinsic value of an energy manager. However, many would acknowledge that the perceived value of an energy manager is often eroded over time. Sustaining both the intrinsic and perceived value therefore becomes critical to maintaining an effective industrial energy efficiency program. How is this done? This paper will investigate findings arising from a set of Ontario pilots concerning how Strategic Energy Management (SEM) can be leveraged to enhance the immediate and long-term impact of incentivized energy manager programs. In 2012, the Independent Electricity System Operator (IESO), formerly the Ontario Power Authority, introduced the Embedded Energy Manager (EEM) program, providing majority funding for full-time energy manager positions at large consumers. While the program enjoyed immediate market uptake, two challenges gradually became apparent. First, while technically adept, some energy managers struggled to secure the executive and wider organizational buy-in necessary to implement capital projects and make and maintain Maintenance & Operational changes. Second, other energy managers were on track to exhaust most of the savings opportunities financially attractive to their employer, placing such consumers in the unfortunate position where remaining savings were significant but insufficient to justify an EEM's continued salary. SEM education emerged as a potential solution to these challenges. The SEM programs provide struggling EEMs with the training, tools, and assistance to secure internal support for projects. In addition, the SEM programs provide highly successful EEMs with a framework to embed energy management in their employer's culture and policy, ensuring continued efficiency efforts in the absence of an externally-funded, full-time position. This paper will present preliminary findings that emerged from two IESO-funded cohort-based SEM pilots featuring a mixture of customers with and without EEMs.

## INTRODUCTION

In 2011, the Province of Ontario renewed its commitment to electricity Conservation and Demand Management (CDM) with the launch of a new generation of programs through a four year (2011-2014) funding framework between the Independent Electricity System Operator (IESO) and the province's over seventy Local Distribution Companies (LDCs). [1]

[1] On January 1, 2015 the Ontario Power Authority (OPA), central administration for the province's 2011-2014 CDM program, merged with the Independent Electricity System Operator (IESO) and assumed its name. For the sake of simplicity and consistency, "IESO" will be used to refer to the pre-merger OPA organization.

Included in this new program portfolio was the EMBEDDED ENERGY MANAGER (EEM) initiative. This program grew out of internal discussions concerning how to better engage large users in existing incentive programs and energy management. These talks identified incentivized energy manager and Monitoring & Targeting (M&T) programs as high-potential enabling resources. After consultation with BC Hydro regarding their experience with energy manager programs in the industrial sector, a decision was made to include such a program among the new saveONenergy-branded offerings.

Through the EEM initiative, Industrial, Commercial, and Institutional (ICI) consumers can apply through their LDC to receive compensation equivalent to 80% of the annual salary (up to a maximum of $100,000 CAD) for a full-time energy manager resource. Rather than set a minimum facility peak KW demand or annual MWh consumption value for eligibility, applicants must demonstrate the potential to meet an EEM's annual target:

- 0.3 MW of demand savings during peak periods; and,
- annual consumption savings equal to 0.3 MW of peak demand savings X Facility Load Factor X 8760 hours.

Of this, a minimum of 30% of savings must come from projects not financed through the saveONenergy incentives available for capital CDM projects.

To support reaching this target, EEMs are contractually required to:

- maintain an energy tracking and monitoring system for each facility;
- develop and update an electrical load inventory of major equipment;
- conduct walk-through audits to identify savings opportunities for further investigation;
- review maintenance and operating schedules and procedures to identify operational savings opportunities;
- lead project recommendations to senior management including business case preparation and facilitation of incentives;
- coordinate implementation of CDM projects;
- Support participants and LDCs in developing a strategy for savings Measurement & Verification (M&V) at a corporate, not project, level;
- implement an employee energy awareness and training program;
- submit savings reports on a quarterly basis; and,
- develop an energy management plan for each facility under their responsibility where one does not exist within 6 months of hiring.

To qualify for EEM funding an individual must be professionally designated as a certified engineering technician or technologist (CET), certified energy manager (CEM), or be licensed as a professional engineer in Ontario. Additionally, those without the CEM designation are required to seek it with training available at a subsidized rate. This approach grants considerable flexibility to hiring organizations with several promoting internal personnel into this role (please note that in this circumstance, organizations are contractually required to back-fill the EEM's previous position). Anecdotal evidence suggests that many of the most successful EEMs fall into this category, with superior knowledge of internal processes and relationships facilitating project approval and implementation compared to external hires.

Additionally it was recognized that many ICI customers could also benefit from the services of an energy manager but alone lacked the savings potential to justify a dedicated, full-time resource. The IESO collaborated with the LDC community to develop two complimentary solutions to meet the needs of these customers.

First, with the simultaneous launch of the ROVING ENERGY MANAGER (REM) initiative, funding was made available to LDCs to fully cover the cost of directly hiring personnel subject to the same annual savings target but assigned to multiple facilities across an LDC service territory. Through the REM initiative, participating ICI customers have access to a technical resource to assist with identification, managerial approval, implementation, and measurement & verification (M&V) of CDM projects.

Second, based on historic program uptake, the IESO realized that the REM approach would have limited impact on certain subsectors characterized by wide dispersal across service territories and possession of at least one of the following:

- complex and onerous health and safety regulations;
- particular procurement processes; and,
- acute internal resource constraints.

For this reason, and building on subsector-specific energy manager program pilots conducted with the Ontario Forest Industries Association, York Catholic District School Board, and other partners, the IESO decided to implement a third energy manager stream for five high savings-potential subsectors that fell into this category: water/waste water treatment, health care, municipalities, hospitality, and retail.

Under this approach, dubbed the Energy Efficiency Services Provider (EESP) initiative, funding for energy manager positions was provided directly to five non-profit relevant industry associations and agencies. EESPS became active in the market in 2013 and early 2014. While evaluation is still underway, by the increase in volume of incentive applications from these sectors it appears these organizations have been able to well leverage their existing relationships and specialized knowledge of members' needs and constraints.

At the conclusion of the 2011-2014 CDM framework, the IESO was heavily invested in energy manager programs, providing funding for 98 energy manager resources across the province, including:

- 52 Embedded Energy Managers;
- 24 Roving Energy Managers; and,
- 22 Energy Efficiency Service Providers.

While verified results are not yet available, as of April 2015 Ontario's EEM and REMs had reported a total of 173,606 MWh of energy savings and 29.8 MW of peak demand savings, of which 48,570 MWh and 6.5 MW were from projects implemented without incentives from the saveONenergy programs.

## CHALLENGES

While successful in terms of cost-effectiveness, market uptake and savings impact, two converse challenges emerged in the EMBEDDED ENERGY MANAGER initiative with implications for the IESO's wider energy manager resources.

The first concerns the requirement that EEMs meet at least 30% of their annual target through non-incented projects. While the majority of EEMs are reaching their overall savings target, many continue to struggle with meeting this number. Originally intended as a means to force EEMs to think beyond capital projects and engage with operational and behavioral efficiency, quarterly EEM reports instead revealed that many energy managers were resorting to not applying for incentives for eligible capital projects. Additional informal communication made it clear that EEMs desired additional training and assistance in this area, including how to document and verify these savings.

The second challenge was that some highly successful EEMs were on track to exhaust most of the savings opportunities financially attractive to their employer, placing the program administrator in the unfortunate position where remaining potential savings were significant but insufficient to justify an EEM's continued salary. In light of this, the challenge became how to promote continued participation in CDM programs and safeguard the savings persistence of implemented projects in the absence of an externally-funded position.

## A POTENTIAL SOLUTION: SEM

In internal conversations centered on addressing these two challenges and more generally enhancing the impact of the energy manager resources, Strategic Energy Management (SEM) programs emerged as a potential solution.

SEM can be defined as:

> Taking a holistic approach to managing energy use in order to continuously improve energy performance, by achieving persistent energy and cost savings over the long term. It focuses on business practice change from senior management through shop floor staff, affecting organizational culture to reduce energy waste and improve energy intensity. SEM emphasizes equipping and enabling plant management and staff to impact energy consumption through behavioral and operational change. While SEM does not emphasize a technical or project centric approach, SEM principles and objectives may support capital project implementation (CEE 2014, 1).

IESO had previous experience with SEM through a three-year pilot launched in 2009 in which engineering consulting firm Hatch Ltd. assisted five Ontario manufacturing plants in implementing the American National Standard Institute's Management System for Energy (ANSI/MSE 2000/20008) with one plant progressing to successfully obtain certification for the ISO 50001 Energy Management Standard. Shortly after commencement of the pilot, the Hatch project lead joined the IESO and remained engaged in SEM through participation in the ISO 50001 community, including as an active member of the Canadian Standards Association's TC 242 Committee, the body that represents Canadian interests in Energy Management at the International Organization for Standardization. This involvement enabled the IESO to gain

insights into global best practice thinking on sustaining energy management within an organization.

In May 2013, serendipitously as discussions began regarding a formal procurement of SEM pilot services, the IESO Conservation Fund, IESO's primary vehicle for funding innovative conservation projects, received two applications from experienced SEM program delivery agents. Both sought funding to deploy SEM pilots in Ontario to further demonstrate the cohort model that was showing promise in Northwest Energy Efficiency Alliance's Montana Small Industrial Cohort as a lower cost, lighter touch delivery model compared to traditional one-on-one participant-program delivery agent interaction (Gilles, Brown, and Boston, 2013).

A decision was made to proceed with developing both submissions as parallel, complimentary projects:

- EnerNOC (formerly Global Energy Partners), partnered with LDCs Toronto Hydro and PowerStream, would deliver a SEM pilot to Commercial & Institutional (C&I) customers; and,
- Strategic Energy Group (SEG), partnered with LDCs Toronto Hydro and Enersource, and natural gas utility Enbridge Gas Distribution to deliver their pilot to Industrial customers.

In both cases, participation was to be split as evenly as practical between organizations with, and without, an Embedded Energy Manager to enable a comparison of impact.[2]

IESO secured executive approval in November 2013. Following contracting and recruitment, both pilots held their launch events in June 2014.

Due to the limited size of the pilot, few participant details can be provided without violating confidentiality, however; Table 1 below provides a breakdown of the sub-sectors from which participants were ultimately drawn.

Table 1: Pilot Participant Sector Representation

| **Industrial Cohort** | **C&I Cohort** |
|---|---|
| Plastics | Healthcare |
| Food processing | Transit |
| Pulp & Paper | Telecommunications |
| Packaging | Event Venues |
| | Post-Secondary Education |
| | Places of Worship |
| | Hospitality |

[2] In cases where a Roving Energy Manager was devoting the majority of their time to a single client and had secured equivalent privileges (i.e. unescorted facility access), a decision was made to accept them as an EEM for the purpose of the pilots.

## A NEW FRAMEWORK

In March 2014, as the four-year framework through which the energy manager resources were funded neared the end of its mandate, the Ontario Ministry of Energy directed the IESO to implement a new six-year (2015-2020) framework, known as the Conservation First Framework. In compliance with this directive, IESO-LDC Working Groups began work on redesigning the provincial CDM program portfolio and individual programs – including the EEM, REM, and EESP initiatives.

While recognizing that both SEM pilots were mid-implementation, a request was made for preliminary findings from the projects to inform the development of the next generation of energy manager resources. As such, a meeting was convened in March 2015 bringing together a total of 12 EEMs participating in the pilots and various IESO stakeholders. Facilitators lead the group through a series of exercises to identify the highest-value program components, potential areas for improvement, and other lessons. Additionally, EEMs completed questionnaires at the meeting conclusion.

At this point, a few caveats must be noted:

- At the time of the meeting the Industrial Cohort had completed 5 of 8 implementation stage milestones, the C&I Cohort, 5 of 7;
- Representatives from 8 of the 10 Industrial Cohort participants participated versus 4 of the 10 C&I Cohort; and,
- The representation from the C&I Cohort was biased towards organizations that entered the pilot with relatively high levels of energy management engagement.

Notwithstanding, the meeting produced a number of preliminary findings relevant to the challenges noted above.

## KEY PRELIMINARY FINDINGS REGARDING ENERGY MANAGER CHALLENGES

### Energy Mapping

Possibly the strongest feedback was on the high value of the energy mapping exercise the Industrial Cohort completed. A common tool of lean manufacturing, mapping electricity, natural gas, and other energy inputs through key processes enabled participants to "see" efficiency opportunities difficult to identify through pure data analysis, particularly opportunities to optimize processes and "right-size" or eliminate oversized or redundant equipment. In a meeting exercise, Industrial Cohort participants located Energy Mapping squarely as a high-impact, high-effort activity on an impact-effort matrix.

Based on their experience in the SEM pilot, many requested further energy mapping training and tools to facilitate energy mapping of additional processes and facilities.

### Dashboards and Metrics

While EEMs have access to meter and often sub-meter data, these data sets alone are insufficient to provide an understanding of how a facility and key processes consume energy.

Both cohorts communicated that assistance in developing appropriate metrics and tools to track energy performance over time were significant motivators for SEM participation. This was particularly pronounced with the C&I Cohort where the choice of appropriate metric is often more discretionary than the typical kWh per widget or kilogram of product used in industrial settings. An EEM from a university stated they had particular difficulty in identifying an effective metric due to the seasonal variability in building occupancy and energy-intensive lab use throughout the year, and had even considered kWh per research dollar.

The Industrial Cohort placed the development of energy performance indicators and tracking tools as a mid-effort, high-value activity. The C&I Cohort reported that this module within the pilot delivered less value to them, which appeared to reflect a debate over the appropriate level of granularity.

While not investigated in depth, this discussion and other participant and program delivery agent comments regarding challenges with data collection and reporting highlights the valuable role Energy Management Information Systems (EMIS) can play in SEM programs (Crower, Kramer, and Effinger, 2014)

### Technical Knowledge Gaps

Particularly with the C&I Cohort, there exists a knowledge gap regarding project identification and implementation for more sophisticated system optimization and recommissioning activities compared to traditional capital projects (for instance, installing variable-speed drives on hydronic pumps). The energy mapping exercise appears to have assisted with identification but the EEM group reported mixed results regarding the SEM pilot impact on implementation.

### Capturing Non-Incented Savings

In the course of the meeting, it became apparent that where EEMs have identified non-capital efficiency opportunities they often struggle with questions about how to adequately capture the savings. An initial exercise concerning motivations for pilot participation revealed that assistance with developing whole-facility energy models supporting M&V was a major selling point for the SEM pilots. Unfortunately, at the time of the event it was too early to comment on the pilots effectiveness in assisting EEMs to capture and quantify operational and behaviour efficiency interventions.

### Employee Engagement

The majority of EEMs agreed that participation in the pilot had resulted in an increased appreciation of the value of engaging front-line staff to uncover energy efficiency opportunities. However; they also felt that the employee energy engagement materials and training to date did not meet their expectations. It should be noted this feedback gathered prior to completion of the respective pilot modules focused on employee engagement.

### Ensuring Persistence of Energy Manager Impact

EEM responses to questions about the impact of the SEM pilots in embedding energy management within their host organization were mixed. On questionnaires the group indicated a negligible increase in confidence that the energy projects they had identified would be

implemented if they left abruptly compared to before the pilot. However, in workshops, many credited the pilots for instilling a more structured, resilient approach to their organization's energy initiatives and both cohorts identified the SEM pilot assistance with establishing or revising their Energy Teams as high-value. Similar to employee engagement findings, it must be mentioned that at the time this feedback was received, the pilots had yet to complete their respective modules concerning integrating energy management considerations into corporate policy, procedures, and practice.

EEMs from both cohorts identified the development of opportunity registers, a tool that was considered to have potential to prolong the impact of an EEM in the absence of a full-time position, as low-impact, low effort on an impact-effort matrix. Group discussion revealed that they lacked sufficient detail around funding, procurement, implementation, and M&V to provide significant value.

### Intrinsic Value of a Third Party

One of the striking findings was the frequency with which EEMs mentioned the benefits of the visible involvement of a third party in their work. The group reported that the walk-through energy audits uncovered few genuinely new savings opportunities; however, having the SEM program delivery agent (or their consultant) confirm potential projects the EEM had previously identified increased credibility with senior management and boosted EEM confidence in project presentation. The walk-through audits also provided value in that the presence of an unknown third-party piqued the natural curiosity of front-line staff, creating engagement opportunities, and affirming that energy management is something worth devoting resources too. Finally, the knowledge that a "fresh pair of eyes" would be inspecting their facilities, made EEMs identify and reevaluate sometimes erroneous assumptions.

## OTHER KEY FINDINGS

### Cohort Model Application

The EEMs consistently rated the cohort workshops as providing greater value than webinars and one-on-one interaction with the program delivery agents and emphasized the peer-learning and networking benefits of the in-person cohort activities. Conversely, they also consistently requested greater specificity in the SEM curriculum to their organization.

The apparent compromise is to implement SEM programs through industry-specific cohorts; however; this approach is necessarily limited to non-competitive sub-sectors such as education, health care, water/wastewater, municipalities, schools, and universities. This concern is underlined by two eventual participants raising concerns during the recruitment stage about prosecution under competition legislation.

### Participant Milestone Incentives

One of the primary differences between the C&I and Industrial Cohorts was the provision of $1,000 incentive checks to Industrial Cohort energy teams for reaching pilot milestones according to a set schedule. While provided with no strings attached, all participating EEMs reported using, or intending to use, the incentive funds to purchase gift cards, lunch vouchers, and "swag" (hats, t-shirts, etc.) as prizes for employee engagement activities. The meeting produced two lessons concerning milestone incentives.

First the group reported that having a "ticking clock" in incentive eligibility resulted in EEMs providing sub-optimal deliverables to meet incentive deadlines. Due to the typical difficulty in securing funds for employee energy engagement activities they endorsed the practice of providing incentives for milestone completion but with greater timeline flexibility.

Second, several EEMs reported lengthy and time-consuming internal struggles to have the deposited incentive checks credited to their budgets. Instead of offering cash incentives they recommended SEM program delivery agents offer to provide program participants with in-kind incentives for milestone completion (e.g. $1,000 in smaller denomination gift cards).

## OTHER ENERGY MANAGER RESOURCE ENHANCMENT INITIATIVES

In response to feedback from EEMs and REMs, IESO has provided training workshops on specific end-uses such as variable-speed drives, motors, and lighting and in 2014 introduced the OPPORTUNITY ACCELERATOR initiative to provide limited walk-through style energy audits by a third-party technical specialist at no cost to facilities with a peak demand of 1MW or greater.

Of particular note for other jurisdictions offering incentivized energy manager programs was the launch of the online Energy Manager Hub in 2014. The genesis of the hub came from the success of Toronto Hydro's monthly REM meetings in which REMs gathered to discuss successful projects, implementation challenges, M&V strategies, etc. Given the wide geographic dispersion of EEMs and REMs across the province, this in-person model had limited replicability despite the immense value. Consequently, in March 2014 the IESO launched the Energy Manager Hub. Managed by the technical reviewer for the energy manager resource initiatives, the hub features an open forum to pose and answer questions, contact info for all active E/REMs, a list of all submitted incented and non-incented projects, a function to connect energy managers interested in a project with its implementer, and a list of carefully selected resources and tools on various energy conservation measures.

At the time of writing, the IESO has been unable to quantify the impact of these additional resources, however; informal feedback has been positive.

## CONCLUSION

While still mid-implementation, IESO's two SEM pilots have already yielded valuable lessons concerning the enhancement of incentivized energy manager programs and addressing the two primary challenges of the EEM and REM programs as they enter their fourth year in Ontario: boosting the percentage of savings from operation and behaviour efficiency, and more deeply embedding energy management within EEM host organizations to bolster the persistence of savings and continued program participation in the absence of a full-time resource.

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