

Evolution of Ontario’s Incentivized Energy Manager Programs

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ABSTRACT

Since 2011 Ontario has taken a strong position on providing direct financial support to large electricity consumers to hire in-house, full-time energy managers to drive the implementation of non-incented energy efficiency projects and increase participation in existing Demand Side Management (DSM) programs. Today close to 90 energy managers are in the field supporting achievement of the province’s conservation goal of 8.7 TWh between 2015 and 2020. During this time, the energy manager programs and the support resources provided to them have evolved significantly based on input from Local Distribution Companies, service providers, customers, and the energy managers, including a full re-launch of programs as part of a new DSM mandate.

This paper details the evolution of the energy manager initiatives in Ontario with an emphasis on lessons learned relevant to program administrators considering or (re)designing an incentivized energy manager program.

Origins

In the spring of 2010 the Ontario Ministry of Energy issued a series of directives establishing the Green Energy Act Conservation Framework for the 2011-2014 periods. This framework was aimed at boosting the contribution of DSM programs to meet the province’s electrical system energy and capacity requirements as Ontario eliminated coal fired-generation. In addition, the framework was also intended to ensure that customers located across more than 70 Local Distribution Company (LDC) service territories had access to a consistent set of DSM incentive programs. To these ends, the Ministry set a target of achieving 1,330 MW of [summer] provincial peak demand savings and 6 TWh of energy savings by the end of 2014, and directed the Independent Electricity System Operator (IESO) to design a core portfolio of DSM programs in collaboration with the LDCs to be delivered by every LDC¹.

As the program portfolio design began two of the challenges the IESO and LDCs sought to address were how to better engage large users in traditional DSM programs (i.e. offering incentives for discrete project identification and implementation) and ultimately drive customer adoption of energy management as part of corporate culture and policy, epitomized by ISO 50001 certification. Inspired by BC Hydro’s pioneering incentivized Energy Manager (EM) program and sector-based pilots conducted with the forestry and plastics industries through the IESO’s Conservation Fund, the decision was made to include an incentivized EM program in the new suite of Save on Energy-branded DSM programs.

¹ On January 1, 2015, the Ontario Power Authority (OPA), central administrator for the province’s 2011-2014 CDM programs, 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.

Embedded and Roving Energy Manager Program

Two EM program paths were created to serve different customer groups. The Embedded Energy Manager (EEM) program was geared towards the larger customers while the Roving Energy Manager (REM) was developed for the smaller customers that could individually not meet the targets and requirements of the larger group. The following discussion presents information on these two programs.

Embedded Energy Manager Program

Through the EEM program, industrial, commercial, and institutional (ICI) consumers could apply through their LDC to receive compensation equivalent to 80% of annual salary and benefits up to a maximum of \$100,000 (all figures CAD) for a full-time energy manager resource. Additionally, the program covered up to 80% of annual travel costs to a maximum of \$8,000 in consideration of the travel distances between customers and population centers, particularly in Northern Ontario.

Rather than set a minimum facility peak kW demand or annual MWh consumption value for eligibility, applicants had to justify that they possessed the potential to meet the following targets for the EEM program:

- Demand savings during peak period = 0.3 MW and;
- Annual energy savings = 0.3 MW of peak demand savings × Facility Load Factor × 8760 hours

Participating customers retained access to the equipment retrofit program and other incentive projects; however, EEMs were required to meet a minimum of 30% of their savings target from non-incented programs. To support reaching their target, the EEMs' were 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 the conservation and demand management (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 did not exist within six months of hiring.

To qualify for EEM funding an individual had to be professionally designated as a

Certified Engineering Technician or Technologist (CET), Certified Energy Manager (CEM), or be licensed as a Professional Engineer (P. Eng.) in Ontario. Additionally, those without the CEM designation were required to seek it with training available at a subsidized rate through a parallel training incentive program.

The program intentionally built in hiring flexibility, allowing customers to hire a new employee for the role or promote internally, with protections in place to ensure that internal employees were backfilled and not “double-hatting” or serving two roles.

Ultimately, the program saw an approximately 60/40 split between external and internal hiring. Anecdotally, some of the most productive EEMs have been those sourced internally who are able to leverage their existing relationships, reputation, and informal knowledge of decision making processes to hit the ground running. Program administrators may consider this as a valuable insight when deciding the hiring eligibility criteria.

Roving Energy Manager (REM) Program

Recognizing that there were many ICI customers that would benefit from the support of an energy manager but individually lacked the savings potential to justify a full-time resource, the REM program was launched simultaneously to the EEM as a “sister program.” This program was near identical in terms of incentive structure, target setting, reporting obligations, etc., except the REM was hired directly by an LDC not a customer, served multiple customers, and was not required to develop a corporate-level M&V strategy.

Market Response

Figure 1 below communicates the consistent growth of the program through its five years in the market.²

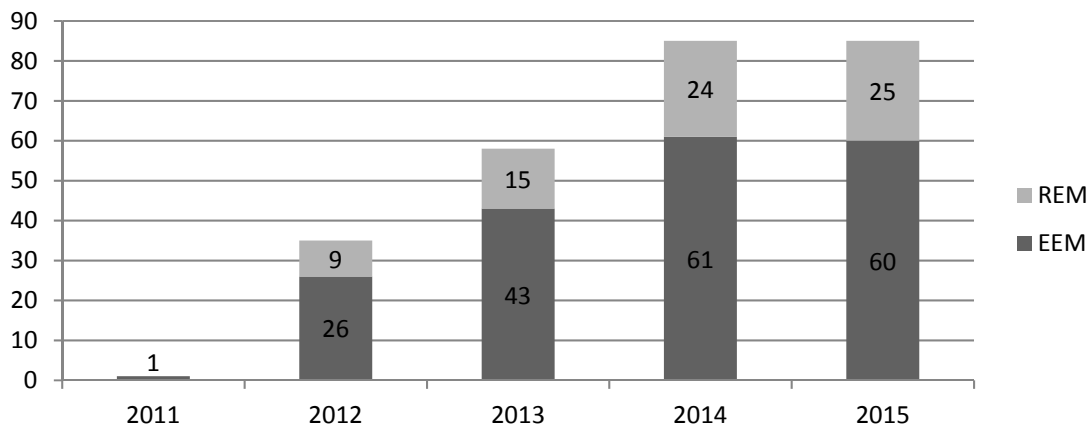


Figure 1: Number of enrolled R/EEMs, 2011-2015. Source: CLEAResult 2017.

Figure 2 segments the participants in the EEM program by sector. While the results certainly reflect Ontario’s economy (a large automotive industry concentrated in Southern

² A mandate was provided to continue some 2011-2014 programs to the end of 2015 to provide time for redesign and roll out of programs under the 2015-2020 Conservation First Framework. For the sake of simplicity this paper will refer to 2011-2014 and 2015-2020 programs.

Ontario, significant forestry and related secondary industry throughout), it does reveal several generalizable take-aways regarding program recruitment.

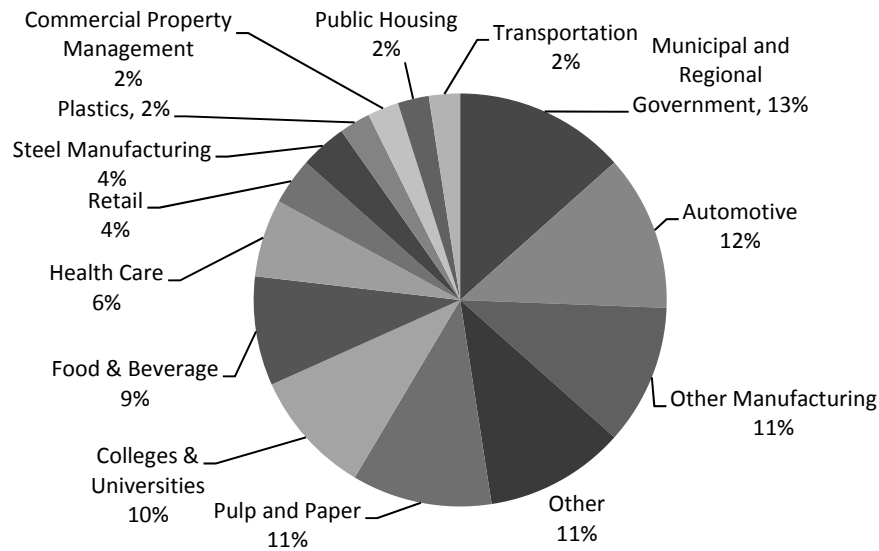


Figure 2. 2011-2014 EEM Program Participation by Sector.

Local government, health care, and post-secondary education customers represented close to a third of participants and are likely to have a growing interest in EM programs with the spread of internal or externally-imposed Green House Gas (GHG) reporting obligations and/or reduction targets. Anecdotal evidence suggests this was certainly the case in Ontario.³

An in-house energy manager at a health care or water/wastewater facility can be particularly valuable to program administrators given the frequent challenges with securing approval for projects beyond lighting in facilities subject to particularly stringent and complex environmental, health, and safety regulations.

The food and beverage processing industry also represented another significant portion of participation, and the response from the automotive industry may be broadly indicative of energy-intensive, high-tech manufacturers. Please note that the EEM program was only available for distribution system-connected customers, hence there were relatively few participants from the primary industries (mining, forestry, etc.). REM customer segmentation is not provided the given the nature of the program.

Results

Over the 2011-2014 period, the R/EEM program generated 117 GWh of net verified energy savings and 15 MW of net verified summer peak demand reduction from non-incented projects

³ In 2013, Ontario Regulation 397/11 went into effect, requiring municipalities, municipal service boards (e.g. water utilities), post-secondary education institutions, schools boards, and hospitals, to publicly report on their annual energy consumption and GHG emissions on an annual basis, and furthermore, to publish reports every 5 years describing planned DSM projects and the results of implemented projects.

(IESO 2015, 21). The program was extended for an additional year, 2015, to provide runway for program redesign and to help relaunch as part of a new DSM mandate during which it generated 36 GWh of net verified annual energy savings and 8 MW of net verified summer peak demand reduction from non-incented projects (Econoler 2016, 30). Third-party evaluation of the 2015 program year calculated a Total Resource Cost (TRC) test score of 0.72, Program Administration Cost (PAC) test score of 1.5, and Levelized Delivery Cost of 1.7, and Levelized Delivery Cost of \$47/MWh (Econoler 2016, xi). These savings results and cost-effectiveness metrics may appear modest but were calculated only counting savings from non-incented projects and do not account for the incremental projects the R/EEM program generated for the Save on Energy Retrofit and other programs offering incentives for capital projects.

A 2014 process evaluation noted that the majority of energy managers were hired from outside of the customer’s existing staff suggesting that the customer did not previously have staff with the required skillsets and/or available time to focus on energy efficiency improvements. It also revealed a strong LDC perception of the program as a success in driving deeper savings, increasing customer capacity, and strengthening LDC-customer relationships. Importantly, two LDCs interviewed noted that based on their performance they had seen EEMs hired as permanent employees by customers, an indication of that the program was making progress on its market transformation goal.

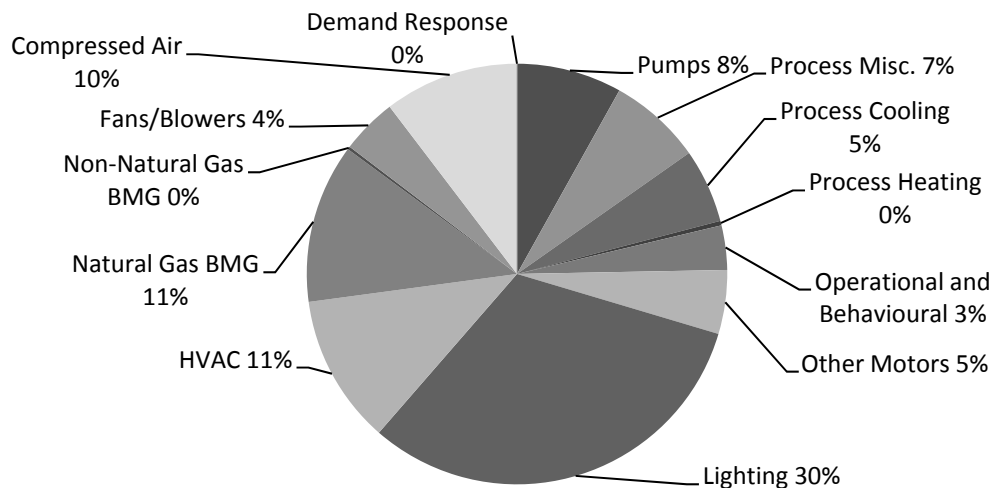


Figure 3. Technology types as a percentage of total reported savings. *Source: CLEAResult 2017.*

A New Framework

In March 2014, the Ontario Ministry of Energy provided the IESO and LDCs a new DSM mandate for the 2015-2020 period. This directive to establish the “Conservation First Framework” (referring to the government’s stated policy of investing in conservation, before new generation, where cost-effective) set a target of achieving 8.7 TWh of savings by December 31, 2020 with a budget of \$2.4 Billion. The directive stated that of the 8.7 TWh, 7 TWh is to be sourced from distribution system-connected customers through primarily LDC-delivered programs, with the remaining 1.7 TWh from IESO-delivered programs for transmission-system

connected customers. Through a related process, savings targets and budgets were established for each individual LDC. Notable changes from the previous framework include:

- A shift to an energy-only target (no peak demand savings target)
- Significantly greater LDC autonomy in program design and delivery, including the flexibility to allocate a six-year budgets as they see fit to meet their targets cost-effectively and to offer local and regional programs meeting specific customer needs
- LDC assumption of primary responsibility for local and province-wide program design

Evolution of the LDC-Delivered EM Program

With the new mandate, the LDCs and IESO convened working groups to (re)design the portfolio of provincial programs for the 2015-2020 periods. The Energy Manager Program subgroup featured representatives from EnWin Utilities, Hydro Ottawa, Hydro One, Toronto Hydro, EnerSource and the IESO. The EM subgroup developed a business case for the redesigned program with several changes informed by Evaluation, Measurement & Verification (EM&V) reports, first-hand experience with the 2011-2014 R/EEM program, and input from the third-party contractor, CLEAResult, that provided technical review, training, and other administrative support for the programs. Key changes are highlighted below.

Reduction in Non-Incented Savings Target. The non-incented savings target, the required percentage of an energy manager's minimum annual savings target achieved from projects that did not receive incentives through other DSM programs, was reduced from 30% to 10%. This change was in response to consistent feedback from energy managers about how challenging the 30% requirement was, particularly after the first year when "low-hanging fruit" had been exhausted. During the 2014 program evaluation, 84% of R/EEMs surveyed reported meeting the target as "somewhat difficult" or "very difficult." When asked to suggest an alternative target level, the most popular response (nearly by a factor of three) was 5-10% (Econoler 2015, 47). In line with this recommendation, the target level was reduced to 10% following an analysis that demonstrated that the program would remain cost-effective (BWG 2015).

Other program administrators may be interested in an alternative solution that was not ultimately pursued: stepped non-incented savings targets. Some energy managers suggested keeping the 30% target for the first year of participation to encourage fast implementation of easy opportunities, but then reducing the target for subsequent years.

Notably, R/EEM feedback highlighted that part of the challenge in meeting the target was not necessarily identifying and implementing the types of Operational & Maintenance (O&M) projects that it was intended to encourage (compressed air leak detection and repair programs, employee behavioural initiatives, etc.) but with accurately and/or cost-effectively measuring and verifying the savings, a subject this paper will address further.

New pay-for-performance incentive option. A new incentive option was introduced to solve two distinct issues. Some energy managers, typically at very large industrial facilities, were achieving their annual savings target early in the year and with their target reached had little personal incentive to drive additional savings until the next program year. On the other end of the spectrum, other customers, particularly municipalities, wanted to participate in the program but were challenged to commit to achieving the minimum annual savings target. By introducing a voluntary pay-for-performance incentive option with a reduced minimum annual savings

target, the redesigned program enables participation from smaller customers while maintaining the engagement of the largest, and in both cases, shifts risk from the ratepayer to the program participant (BWG 2015).

The pay-for-performance option has a minimum annual savings target of 1,000 MWh compared to 2,000 MWh for the salary based option, and incentive is set at \$40/MWh up to an annual maximum of \$150,000. Participants can transfer from the salary to pay-for-performance incentive structure but not vice versa.

Roving Energy Manager. The redesigned Energy Manager program dropped the REM option in the interest of administrative efficiency. With the revised IESO-LDC roles and responsibilities under the Conservation First Framework, LDCs could choose to use part of their budget to hire staff directly to perform this role.

Additionally, the new EM program removed eligibility restrictions limiting participation to individual customers. Associations or other groups of customers in one or more LDC service territory can share an energy manager “roving” between multiple sites; however, to date this option has not been exercised.

Contract term. 2011-2014 EEM contracts had a one year term with the LDC able to renew for additional terms pending IESO confirmation of funding availability. The new EM contracts have a default term of the end of the 2015-2020 framework with the annual extension/cancellation clauses. This change delivers benefits to all stakeholders: funding stability and less administrative burden for LDCs and participants, and increased job stability for energy managers which helps participants attract and retain high-quality personnel in the role (BWG 2015).

New IESO-delivered EM Programs

While the LDC-delivered Energy Manager program forms the backbone of Ontario’s EM initiatives, IESO manages additional EM programs to support specific types of customers and support achievement of the Conservation First Framework’s energy savings target.

Energy Manager for Multi-Site Customers Program. Multi-site customers, that is customers with facilities located in more than one LDC service territory, were responsible for a disproportionate volume of Ontario DSM program participation and energy savings in the 2011-2014 framework and the IESO recognized that maximizing their engagement during the 2015-2020 framework would be vital to meeting the provincial energy savings target.

While multi-site customers are eligible for the standard 2015-2020 Energy Manager program, IESO developed an alternative EM program option specifically for this customer group based on extensive stakeholder consultation with customers, LDCs, and service providers.

For multi-site customers, the program offers administrative simplicity through a single contract and single point of contact with the IESO for activities across the entire province. For LDCs, it addresses equity concerns by sourcing funding from a central budget, avoiding having a single LDC pay for an energy manager who is working on projects across multiple LDC service territories. As noted above, this is an option for multi-site customers and some LDCs have agreed to fund multi-site customer energy managers through the main EM program where they have an existing strong relationship with the customer.

Eligibility is limited to customers with facilities in five or more LDC service territories and combined summer peak demand of 15 MW or 75,000 MWh of annual electric consumption.

Similar to the Industrial Accelerator EM program, incentives are strictly on a pay-for-performance basis at \$40/MWh with a 2,000 MWh annual savings target and 10% minimum non-incented savings target.

This program began accepting applications on budget-limited first-come, first-serve basis on Jan 22, 2016. As of June 2017, 8 multi-site customers have been accepted with budget remaining for 2-4.

Industrial Accelerator Energy Manager Program. With the new framework IESO retained responsibility for the design and delivery of DSM programs for customers directly connected to the transmission system, under the Industrial Accelerator brand. These customers are primarily but not exclusively, large industrial facilities such as steel mills, petrochemical facilities, and mines. Based on the success of the 2011-2014 EEM program with distribution system-connected industrial customers, IESO adapted the EM program with targets and incentive caps reflecting the greater savings opportunity and facility complexity of this customer class.

Program participants commit to a 2,000 MWh annual savings target (of which 10% must come from non-incented projects) in exchange to accessing incentives on a pay-for-performance basis. Customers receive incentive payments at a rate of \$40/MWh up to \$200,000 with \$50,000 provided upfront at the EM's start date and every subsequent anniversary.

As of June 2017, twenty-one customers, representing over a third of all eligible participants, are now participating in the program with a total of twenty-four EMs.

Helping Energy Managers Succeed: EM Support Services and Tools

Ultimately, the success of an EM program depends on the success of the individual energy managers. Many of the most valuable lessons learned during the seven years to date of EM programs are less concerned with program design and administration and more with how to support the energy managers to maximize their success in identifying efficiency opportunities, securing approval for solutions, implementing, and measuring the results. Each of these steps requires different skills.

A 2014 process evaluation revealed that an overwhelming majority, 96%, were satisfied with the program's support; however, IESO has continued to strive for further improvements, of which key features are discussed below (Econoler 2015, 58).

Please note that a detailed description of the support provided to Ontario's energy managers, the results, and a broader discussion of the development of a professional culture among them can be found in "Transforming Markets via Energy Manager Culture" (ACEEE 2017)

Channels for Supporting EMs

Soon after the launch of the 2011-2014 R/EEM program, Toronto Hydro started hosting monthly meetings for its REMs to come together to share successes and collaboratively discuss challenges. The knowledge-sharing and motivational value of these meetings was soon apparent to the REMs, Toronto Hydro, and other observers. Due to size of the province and geographic dispersion of R/EEMs, hosting frequent in-person meetings for all energy managers was not

practical. Consequently, IESO embarked on a two-pronged strategy with CLEAResult, to offer additional support beyond the initially planned technical training to replicate the success of Toronto Hydro’s monthly meetings through other means.

Hub and Hub Flash. The first strategy to collaborate and share information was the development of a private online forum for R/EEMs, known as the “the Hub.” Managed by CLEAResult, the Hub features an open forum to pose and answer questions, contact info for active energy managers, a list of all submitted incented and non-incented projects, a function to connect energy managers interested in a project with its implementer, a list of carefully selected resources on various energy conservation measures, and tutorials on topics such as M&V. The 2014 program process evaluation revealed that 69% of R/EEMs had used the Hub and those that did reported an 81% satisfaction rate with the discussion board being the most popular feature (Econoler 2015, 58).

The Hub is complemented by a monthly newsletter “Hub Flash” alerting energy managers to upcoming events, newly available resources, and other news. Each newsletter also includes a profile of an energy manager.

In-Person events. The second strategy to collaborate and share information was through regional, and eventually, sector-specific workshops. These workshops typically feature a peer presentation of a successful project, training on a particular topic delivered by CLEAResult (such as a particular element of Strategic Energy Management or understanding project financial metrics), and as they are often hosted by program participants, an “energy hunt” where EMs tour the host facility searching for undiscovered efficiency opportunities.

Recognizing the motivational power of peer recognition, a newer event is the annual EMmy Awards ceremony with multiple categories including Energy Manager of the Year, Most Innovative Project (Capital and O&M categories), and Most Non-Incented Savings as a Percentage of Load.

Personal onboarding meetings. A well-received recent development has been conducting in-person onboarding meetings with new energy managers. In these meetings, new energy managers learn about program requirements, the support resources available, and tips for success. These meetings accelerate the program learning curve and connect them to the wider energy manager community with the objective of increasing the speed at which new energy managers begin to generate projects, supporting first-year attainment of their target.

Priority-Support Topics

In 2013, IESO launched two Strategic Energy Management (SEM) pilots each featuring cohorts of (initially) ten customers, half with R/EEMs and half without. These pilots, the 2014 program process evaluation, and other more informal feedback mechanisms, revealed two persistent challenges.⁴

⁴ Please see *Helping Energy Managers Excel – Sustaining a vital role in Ontario’s Conservation First Framework* published in proceedings from the 2015 ACEEE Summer Study on Energy Efficiency in Industry for more information on lessons from the SEM pilots relevant to energy managers.

Measurement & Verification (M&V) of Operations & Maintenance (O&M) measures. As noted earlier in the paper, where energy managers identified and implemented the low- and no-cost O&M measures they needed to meet their minimum non-incented savings target they often struggled to measure and verify the savings with sufficient rigor to satisfy the technical reviewer or program evaluators. Feedback from SEM pilot participants indicated that a major motivation for enrolling in the program pilots was the promise of support to develop IPMVP Option C compliant CUSUM models for their facilities to capture energy savings at the whole-building level. Despite the high overall level of satisfaction with the program support, the R/EEMs interviewed for the 2014 process evaluation highlighted training on M&V of non-incented savings project as a support gap.

Serendipitously, shortly after the launch of the SEM pilots, IESO agreed to fund the latest evolution of Natural Resources Canada's RETScreen Clean Energy Management software. RETScreen Expert, launched in 2016, includes an integrated Performance Tracker module to make it easier and faster to create and update whole facility regression models for M&V. Tool users can upload a facility's monthly or daily electricity consumption data using the Green Button Download My Data standard or other formats, upload additional energy driver data if relevant [e.g. production data for a manufacturing plant] and indicate its location. RETScreen Expert will automatically pull historical meteorological data for that location from the US National Aeronautics and Space Administration (NASA) and create a regression model with the data provided. In the spring of 2016, the IESO coordinated with Natural Resources Canada and CLEAResult to provide EMs with licenses and training for the tool prior to the official launch and it has since been integrated into regular training.⁵

Business presentation skills. The SEM pilots and informal feedback revealed that many energy managers, primarily engineers by background, while often technically proficient, lacked the business presentation skills required to secure executive approval and wider organizational buy-in for projects.

Recognizing this skills gap, IESO has worked to incorporate business case development and presentation training into in-person EM events and expanded access to specialized training events on selling energy efficiency to energy managers beyond the initial LDC audience.

Conclusion

It is the ambition of this paper to present some lessons from Ontario's experience with EM programs that may be valuable to other program administrators.

The single most significant takeaway is to recognize that building a program around people is different than building a program around widgets. In setting eligibility criteria and program conditions, administrators should be mindful that contract term and salary will have a major impact on attracting and retaining high performing personnel. As understanding internal decision-making processes and building trust is vital to securing large project approval, retention

⁵ Based on strong positive feedback from energy managers and other Ontario customers, IESO is now funding further RETScreen Expert development. Planned enhancements include automated data transfer with the Portfolio Manager benchmarking tool and a new Application Program Interface (API) for integration with third-party Building Energy Management tools and sub-metering systems.

is important with historical program data on target achievement showing a strong positive direction over time (CLEAResult 2017, 6-7).

For the same reason, program administrators should consider allowing customers' qualified existing staff to fill energy manager roles, provided backfill protections are put in place, rather than insist on external hiring.

Given the range of skill sets required by successful energy managers, almost all will benefit from supplemental training. Crucially, given the technical certifications typically required by EM programs, the most pressing skills gaps will likely concern the "soft skills" required to secure executive approval for capital projects and lower-level buy-in for O&M projects such as business presentation, financial analysis, and employee engagement.

Most program administrators are well-acquainted with the power of peer dynamics from delivering home energy report programs for residential customers or involvement with business customer energy benchmarking initiatives. Establishing opportunities for energy managers to connect, learn from, and recognize each other, either at training workshops, virtual forums, energy hunts, or other events, is a powerful way to drive greater long-term results.

Pay-for-performance incentive models can provide multiple benefits to EM program administrators compared to providing a fixed salary-based incentive, managing the financial risk from accepting customers with limited apparent savings potential while also motivating high savings potential customers to maximize results. However, some customers, particularly in the broader public sector, may be unable or unwilling to accept the risk inherent with pay-for-performance. Program administrators may consider offering customers different incentive model options with other program requirements adjusted accordingly.

In parallel with the IESO expectation that energy managers will adopt principles of continuous improvement in their energy management practice, IESO is committed to continuously improving the EM programs and incubating a culture of conservation in the province.

A consequence of the popularity of the EM programs is that some new participants have found it challenging to find qualified candidates to fill incented positions. Through Conservation Fund grants to various educational institutions and the availability of incentives for training and accreditation through the Save on Energy Training & Support program, IESO has sought to expand the pool of high performing energy professionals in the province. However; to meet the participation goals for the 2015-2020 EM programs, a more aggressive strategy may be required.

Some customers, particularly transmission system-connected customers, municipalities, and post-secondary education institutions, now have non-incented energy management staff. Potentially extending support services to these personnel presents a low-cost opportunity to drive more energy savings while establishing a pathway for IESO and LDCs to gradually transition from the provision of direct financial incentives as the program achieves its market transformation goals.

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