

# Transforming Markets via Energy Manager Culture

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## ABSTRACT

Ontario's Energy Manager Program and similar programs elsewhere are putting people in positions where overcoming the barriers to success requires a range of technical and non-technical skills that few possess. It is a rare individual that can do the job, and energy manager programs are having to invest in and widen the pool of qualified candidates. If the profession of energy managers can be made commonplace, and markets respond by retaining these professionals as incentives recede, the market will have been substantially transformed.

Ontario's energy manager support services are unique among energy manager programs and are contributing to a culture of energy managers that is necessary for the profession to become normalized. Regular training events are a major component of these services, providing instruction and the opportunity for energy managers to learn from each other. Training is supported by the Energy Managers Hub, a unique online resource; and the Hub Flash, a monthly email newsletter with links to resources. With open rates substantially higher than the average email newsletter, the Hub Flash is proving a central element of the culture of Ontario's energy managers. These events and resources are unique components of Ontario's energy manager program.

Support services are fostering a culture in which energy managers are able to make themselves more valuable to their employers, and therefore making it more likely that energy managers will be retained in the long term. Through the support of energy manager culture, markets are being transformed.

## Introduction

Energy Manager programs are becoming more common among conservation-minded utilities and system operators in North America. Ontario's Independent Electricity System Operator (IESO) operates its Energy Manager Program, its Industrial Accelerator Program's Energy Manager Initiative, its Multi-Site Customer Energy Manager Program, and will soon have a program for sector-based Energy Managers. Currently, there are 83 program-funded Energy Managers in Ontario across all programs.

Like most Energy Manager programs, the IESO's programs provide an incentive to the employer to hire an Energy Manager, and set a savings target that the Energy Manager must achieve. The IESO sets targets in MWh of electricity saved. A typical target for an Ontario Energy Manager is 2,000 MWh/year.

Unlike most utilities and system operators, the IESO offers training customized to Energy Managers' needs, one-on-one support, and additional online networking and reference resources for Energy Managers. These unique elements of the IESO's Energy Manager Programs are helping to create a culture among Energy Managers. That culture is increasing Energy Manager success rates and accelerating market transformation.

The market transformation that the IESO's Energy Manager Programs are aiming for includes the normalization and market acceptance of the profession of Energy Managers. Energy Managers, professionals whose role is to primarily focus on controlling utility costs by reducing

energy consumption, are a relatively recent phenomenon. They serve their employers' interests, but also the interests of utilities and system operators aiming to manage costs by minimizing demand for infrastructure. A successful market transformation would be a transition from a market in which employers are willing to take on Energy Managers if there is an incentive to a market where employers compete to hire the best Energy Managers, incented or not. To increase the likelihood of a successful transformation, the IESO is not only providing incentives, but also training and other forms of support for Energy Managers.

Table 1 provides an overview of the training elements of Energy Manager programs and other comparable programs in North America. One unique aspect of the training services offered to Ontario's Energy Managers is that the training is continuously ongoing for all Energy Managers involved in the program, having started in 2015 and with plans to continue until at least 2020. Training is open to Energy Managers for the duration of their involvement with the program, and in some cases beyond. Another unique element is that instead of a pre-packaged curriculum, the training agenda is set based on the needs of Energy Managers as expressed by the Energy Manager community, with some market-ready training being leveraged but most training being custom built to serve the Energy Managers' purpose. Early 2017 will see the launch of a formal training needs assessment that will survey Energy Managers, their utilities, and other stakeholders, and will shape the continuing Energy Manager training curriculum going forward.

Table 1. Training offered by Energy Manager and comparable programs in North America

System Operator/ Utility	Program	Training offered	Duration of Curriculum	Training customized to expressed needs of Energy Managers?
NYSERDA	On-site Energy Manager pilot	No	N/A	N/A
NYSERDA	Strategic Energy Management pilot	Yes	12 months	No
Bonneville Power Administration	Energy Management	Yes	13 months	No
Energy Trust of Oregon	Strategic Energy Management	Yes	12 months	No
Puget Sound Energy	Energy Management	Yes	36 months	No
AEP Ohio	Resource Conservation Manager	Yes	13 months	No
BC Hydro	Energy Manager Program	No	N/A	N/A
Efficiency Nova Scotia	Onsite Energy Management	No	N/A	N/A
Ontario IESO	Various Energy Manager Programs	Yes	Continuous	Yes

Sources: AEP Ohio, 2017; BC Hydro, 2017; BPA, 2017; Efficiency Nova Scotia, 2017; ETO, 2017; NYSERDA, PON 3334, 2017; NYSERDA, PON 3411, 2017; PSE, 2017.

Training is only one unique aspect of Ontario’s Energy Manager’s support services. Services include one-on-one Energy Manager support, and an online Energy Manager Hub. Energy Manager onboarding, troubleshooting, help with reaching out to an Energy Manager’s wider organization, and catching Energy Managers up on elements of training they may have missed are among the one-on-one support services available. The Energy Manager Hub offers a wide range of online content and features to help Energy Managers learn, succeed, and communicate with each other.

The intended direct impact of providing skills and support is an increased likelihood of Energy Manager success and value for employers, but an unintended impact of support services has been the development of an Energy Manager culture. Energy Managers are taking advantage of this culture to benchmark themselves against their peers, learn from each other, find and overcome common difficulties, and collectively demand new and better services for their Programs. This culture and what it is able to accomplish may help the IESO achieve market transformation by making Energy Managers more successful in their work and helping Energy Managers establish the value of their profession themselves.

Ontario’s IESO sees their investment in Energy Manager support services as an investment that will result in incremental conservation and a strategic investment in market transformation.

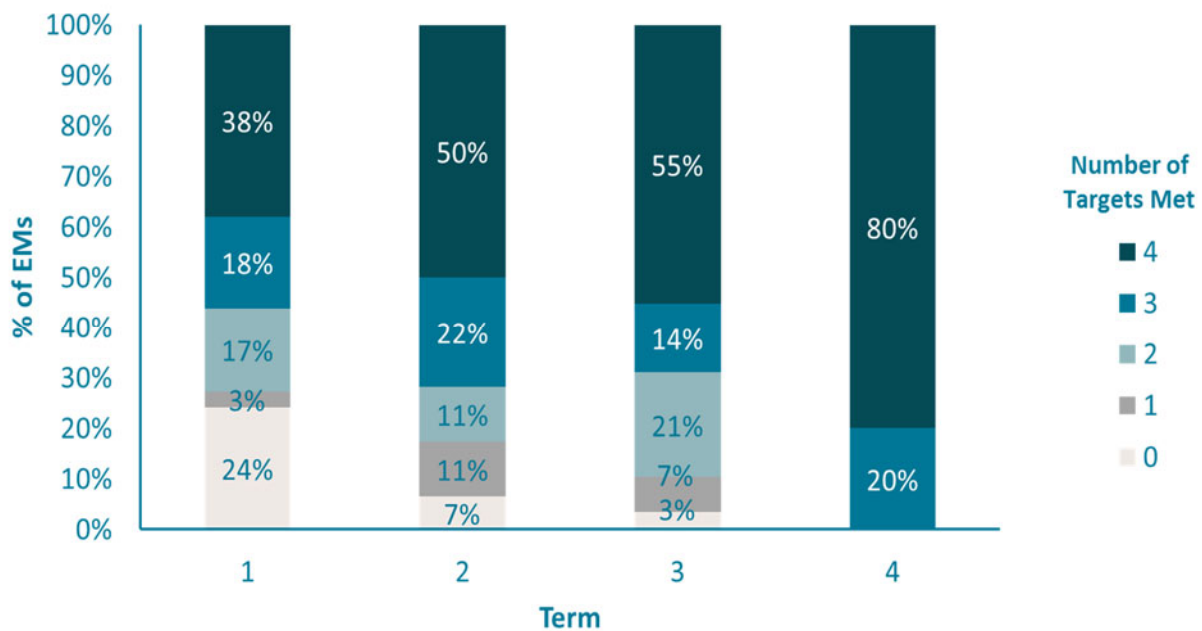


Figure 1: Targets met by Energy Managers out of the four targets set, by Energy Manager term (or year).

### **A Perfect Energy Manager is Hard to Find: The Need for Energy Manager Support**

Earning approval for energy projects, implementing the projects, performing measurement and verification, and balancing the utility budget isn’t easy. In Ontario’s 2011 – 2014 conservation program framework, Energy Managers had 4 targets: A MWh target, a kW target, a MWh target that had to be met using measures receiving no capital incentives, and a similarly non-incented kW target. Figure 1 shows the number of targets met by Energy Managers in their first term (year), and future terms. As can be seen, 62% of Energy Manager

failed to meet at least one of their targets in the first year, but performance improved substantially over time. In fact, Energy Managers typically exceeded targets in future years by enough to cover past shortfalls, and the program proved to be cost effective. However, the high failure rate suggests that succeeding as an Energy Manager is difficult. Ontario’s Energy Manager Programs in the current framework have arguably more stringent rules, aiming for even greater ratepayer value, and Energy Managers must be even more resourceful and skilled to succeed.

The breadth of skills required to successfully realize energy conservation within a large organization is one of the things that make the Energy Manager job difficult. Ontario’s Energy Managers are required to be engineers or have similarly relevant technical background, must be Certified Energy Managers (C.E.M.) or obtain C.E.M. training within 12 months of joining an Energy Manager Program, and typically need technical expertise in the technologies central to their employers’ processes. On paper, the qualifications are merely technical, however, as one Energy Manager has commented, most Energy Managers quickly realize that they are in the position of an “internal entrepreneur” within their organization. They must be able to sell projects to their managers and senior decision makers. They must be self-motivated in the way entrepreneurs are, they must be able to lead teams, present their ideas effectively, and inspire change.

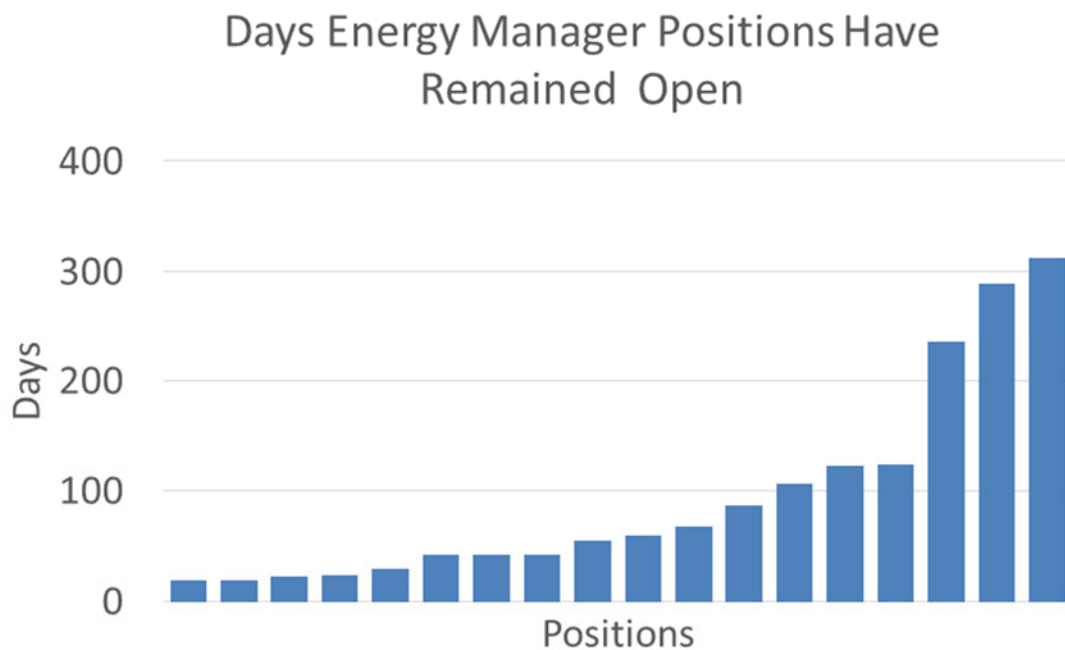


Figure 2: March 17, 2017 snapshot of age of unfilled Energy Manager positions available in Ontario

The necessary combination of technical and soft skills is rarely found within one person, and the breadth of skills required is one reason employers have a difficult time finding the right candidates for their Energy Manager positions. Figure 2 shows outstanding Energy Manager positions available in Ontario’s Energy Manager programs and the length of time those positions have been open as of March 17, 2017. On that date, 18 positions were open. The volume of positions recently opened shows that demand for Energy Managers continues to grow, while the many positions that have been open for 100 days or more show that employers are struggling to

find the right candidates. Not shown in the figure was a position that closed in January 2017 after having been open for 13 months.

With few perfect candidates existing in the market, and proficiency in a rare combination of skills required for success, not all Energy Managers who are hired are expert in the skills they need. Closing the skills gap is part of the mission of the IESO's Energy Manager support services. That mission is executed through training sessions, support visits to Energy Managers, and the Energy Manager Hub online resource.

## **Training Sessions**

Typical Energy Manager Training events are designed for groups of 10 – 20 and hosted regionally by utilities to draw in the local Energy Managers. The small group size allows for more interaction between trainers and Energy Managers as well as between Energy Managers. It also creates the context for participation that might not otherwise be forthcoming from larger crowds, and helps Energy Managers get to know the other Energy Managers from their locale. Training events are either designed for the topic and audience or are market-ready. In some cases, depending on trainer availability, market-ready training events host larger numbers of Energy Managers.

Training has included Strategic Energy Management with a focus on energy baseline models, sales skills, and opportunity identification training in the form of Energy Hunts, among others. Training events are custom-built based on the needs of Energy Managers as informed by feedback from the Energy Managers. As the 2017 needs assessment is completed, the set of training topics will expand further.

## **Strategic Energy Management, Baseline Modelling**

Strategic Energy Management elevates conservation efforts from discrete energy-saving projects to a consistent, holistic, well-documented, data-driven system of continuous energy improvement that is integrated into business practices and conventional continuous improvement programs. Many IESO Energy Manager training events have featured elements of Strategic Energy Management such as building an internal Energy Team, and engaging executive sponsors. One aspect of Strategic Energy Management that has been a focus has been energy baseline modelling and CUSUM (Cumulative Sum) analysis. Energy baseline modelling uses regression analysis to quantify the relationship between a facility's energy use and the independent variables driving that use. The independent variables can then be used to predict energy consumption in the absence of conservation projects, and actual energy use as affected by conservation projects can be compared to the prediction. At each timestep in which actual consumption is less than predicted consumption, savings are demonstrated. A CUSUM chart shows the accumulated, or cumulative, sum of each instance of savings over time. The technique not only provides insight into when energy consumption trends are atypical and might be corrected, but also allows quantification of savings that are conventionally difficult to quantify, such as savings resulting from occupant behavior change.

More energy baseline modelling, and the energy intelligence that baseline modelling provides, are desirable aspects of the market transformation that would ideally come about from Energy Manager Programs. Training in this area has focused on RETScreen Expert's performance modelling module, which performs regression and CUSUM analysis.

In 2015, four Energy Managers were using some form of CUSUM analysis to support their savings claims, with zero using RETScreen Expert. Thus far, after June 2016 CUSUM and

RETScreen Expert training, 11 Energy Managers were using CUSUM analysis to support their conservation claims, eight of which were using RETScreen Expert. Natural Resources Canada, RETScreen Expert’s developer, provided 100 free year-long licenses to Ontario Energy Managers, and over 90 have been claimed. CUSUM analysis is allowing Energy Managers to claim savings that otherwise would not have been substantiated, suggesting that Energy Manager training is directly resulting in increased savings accounted for.

Feedback from this training included quotations from Energy Managers saying:

- “RETScreen...[is] useful info I can use tomorrow.”
- “Regression analysis has changed from myth to reality through RETScreen...and your training.”

Training Energy Managers in baseline modelling and CUSUM analysis has provided the Energy Manager community with tools they can use, and have been using, to more robustly quantify savings.



Figure 3: Energy Managers engaging in sales training

## Sales

Developing internal support within an organization for energy efficiency projects is a major challenge for Energy Managers. Projects that make business sense are sometimes lost in the noise of other projects, day-to-day work, or the many other priorities that strain decision-making capacity. Energy Managers need to convince decision makers that their projects are a priority, which is to say that they need to sell their projects. Not many engineers have a strong instinct for sales, sales training or experience, or even an interest in sales.

In February 2017 the IESO hosted “Learning to S.E.E: Sell Efficiency Effectively” with Selling Energy’s Mark Jewell and Know Energy’s Steve Dixon. The training focused on

developing decision-maker interest in projects, being persuasive, and translating the elements of an energy efficiency project into terms that different stakeholders such as managers, CFOs, and CEOs understand.

Energy Managers were engaged and worked collaboratively, as shown in Figure 3, and came away with concrete tools and skills they could use to increase their project approval rates. Energy Managers attending the training said the following about the value they gained:

- “This is very applicable to my work and my general skills in influencing others.”
- “...adds tremendous value to green project proposals”

In a separate training session, finance metrics training was provided (among other topics), using RETScreen Expert’s finance module. While statistics like modified rate of return rarely capture engineers’ attention, 68% of event feedback respondents rated the training on finance metrics as the most valuable takeaway of the session. Sales and finance are not subjects normally associated with engineers, but the challenge Energy Managers face demands skills in these areas, so training is being provided to transform and develop the Energy Manager in this way.

### **Energy Hunts**

Training has also included energy hunts in which 5 to 20 Energy Managers meet at a fellow Energy Manager’s facility and search the site together for conservation opportunities. The 2016 Energy Hunts were organized to bring Energy Managers from the same sector together, bringing manufacturing Energy Managers to manufacturing sites, municipal Energy Managers to municipal sites, etc. Energy Managers from within a sector stand to gain from each other’s experience, and are able to compare how their different organizational cultures impact their conservation work. For example, one set of hospital-based Energy Managers tended to almost exclusively focus on their control room and central plant, while others were focused on energy end use. An energy hunt within one hospital resulted in the exploration of areas of the hospital that were initially overlooked, and where many quick payback end-use projects such as lighting retrofits were available. These projects were quickly identified by the Energy Managers who tended to focus on end-use projects. Conversely, end-use-focused hospital-based Energy Managers were able to adopt energy-saving techniques for central plant management from the hosts.

Energy hunts help Energy Managers learn opportunity identification skills, and also allow them to identify pain points common to their sector so they can help each other. Opportunities identified during Energy Hunts are recorded and compiled in a report to the host organization, making the time spent valuable to hosts and resulting in energy savings that otherwise would not have occurred.

### **One-on-one Support**

In addition to group training, Energy Manager support includes one-on-one visits to help with Energy Manager onboarding and specific issues Energy Managers are facing. Energy Manager onboarding acknowledges that an Energy Manager’s first year can be the most challenging year and seeks to bring Energy Managers up to speed on program requirements, strategies and tactics that others have used successfully, and the program support resources available to them. Regarding onboarding visits, Energy Managers have said:

- “[The meeting] is a value-add process. I'm taking a lot away from this meeting, and that's great”
- “I feel that this kind of one-on-one session is really a good tool to ensure all Energy managers are on the same board.”
- “I highly believe that the onboarding meetings add real value to the Energy Managers.”
- “The initiative is a good one to meet and greet in person rather than electronically.”

Visits to Energy Managers also involve logging their questions and the challenges they face so that the Program can better support them. Challenges that have been raised by Energy Managers have included:

- Finding the most direct path to funding approval
- Measuring savings from multiple concurrent projects
- Building trust with building managers
- Dealing with resistance to change

Logging these challenges helps the Programs identify which problems Energy Managers require support and training to deal with. One-on-one support helps Energy Managers succeed and provides input into the evolution of support services.

## **The Energy Manager Hub & Hub Flash**

In addition to training and one-on-one support, Ontario Energy Managers are provided with an online resource, the Energy Managers Hub, or “the Hub”. The Hub hosts a database of Energy Manager projects, an Energy Manager discussion board, and an information library with content on technology, skills, and case studies. Articles relating to relevant news, upcoming training, and available tools are also released through the monthly email, the Hub Flash. Also included in each Hub Flash issue is an Energy Manager profile that breaks down energy savings statistics, provides advice from the profiled Energy Manager, and gives the Energy Manager’s favourite energy-related movie.

Energy Managers have made it clear that the Hub’s resources have made a difference to them and their customers. One Energy Manager related a case in which he was able to use Hub content to save himself and his customer time while achieving results that otherwise would have been impossible:

“We had one customer who'd submitted a huge submetering project and we needed to do post-Retrofit M&V, and we were able to direct him to your tutorials on the Hub Flash on regression analysis. The Energy Manager for that project was able to use your Hub Flash tutorials. We were able to put the ball in their court and they were able to do the bulk of the modelling themselves and that was really huge for us. It took a huge load off our shoulders.”

In another case, an Energy Manager at a major auto manufacturer wanted to install work station fan energy saving modules that would shut off plug load cooling fans when employees had left their station for lunch. The unit’s manufacturer had let its Canadian Safety Association certification lapse, could not sell their product in Canada, and informed the Energy Manager that unless substantial demand in the Canadian market could be demonstrated, they would not bear



the cost of certification. The sales from a single manufacturing plant would not be enough to justify the certification costs, so the Energy Manager reached out with a Hub discussion board post that was promoted in the Hub Flash. Other Energy Managers expressed interest, and with their demand pooled, installing the energy saving module is now a possibility in Canada. This success story is an instance of a culture of collaboration across the Energy Manager profession, and Energy Manager support services fostering that culture.

Hub Flash open rates average approximately 50%, and click-through rates average above 30%. Based on the 2016 Email Marketing Metrics Benchmark Study (Watson, 2016), these rates are in the top quartile of marketing email open and click-through rates, suggesting that the Hub Flash and the Energy Manager Hub content it links to are engaging Energy Managers and providing a common point of reference for the Energy Manager culture that is being developed.

## **Energy Manager Culture**

It is apparent from the feedback and events arising from Energy Manager training and support that an Energy Manager culture is developing along with Energy Manager capabilities. One Energy Manager admitted that he “felt lost” until he attended his first Energy Manager training event. He explained that he had no way to benchmark his performance or to know whether the struggle he was facing in his job was normal. Meeting other Energy Managers at training events gave him a sense that his challenges were real and common.

It’s important that Energy Managers can see, and that the culture they build reinforces, that the struggles they face in their job are normal, that their work is comparable to their peers, and that they aren’t the only one finding the work challenging. The goal of the intended market transformation is to prove the value of Energy Managers, and if Energy Managers are not convinced that they are valuable, the goal is unachievable. They need to see each other and learn from each other, and they do that at training events and through the Hub.

Hub analytics show that the Energy Manager profiles are among the most popular Hub Flash items. The profiles allow the reader to learn what kinds of projects other Energy Managers are doing and what they feel are the most important principles of the profession. The profiles are another way for Energy Managers to find out what is normal for other Energy Managers, and to learn about their profession.

Training events and the Hub have allowed Energy Managers to network and identify common problems. At one recent Energy Manager event, the participants identified poor power supply quality as a common and costly problem. This realization allowed for program resources to be directed toward developing power quality content on the Hub, and also resulted in one Energy Manager volunteering his facility to host a small conference for Energy Managers to address the topic of power supply. Self-organization and problem solving have emerged out of the Energy Manager culture and community, creating value for employers.

Energy Managers have also begun to align their requests around similar small conference-type events that cater to their specific sectors, leveraging the community they’ve built to shape support services into something that will make them more valuable. One Energy Manager said that Energy Manager support services “have done what can be the hardest thing – they’ve listened to the Energy Managers, and delivered what they were looking for - a network for the Energy Managers.” The network is allowing Energy Managers to take control of the support resources available to them.

Training and other Energy Manager events have had the unintended but beneficial consequence of bringing Energy Managers together to learn from each other, help each other,

and direct program resources to serve their needs. The culture that Energy Managers have been able to build for themselves, with program support, is accelerating the establishment of their profession, which serves the intended market transformation.

## Conclusions

Ontario's IESO is investing to ensure that Energy Managers are not left to sink or swim on their own. The Province, through the IESO, is investing in support resources that are aimed at increasing rates of success and increasing the value Energy Managers are delivering to their employers and the economy. The support is manifested as training, one-on-one sessions, and online resources. Results include not only improved Energy Manager skills and resources, but also a network and culture that is expressing the interests of Energy Managers, and creating a network of mutual support. Ontario's Energy Manager Programs are aiming to transform the market by establishing the Energy Manager profession as an accepted and normal part of the economy. The Energy Manager network of support is helping to realize this aim. It is suggested that all similar programs consider support services of the kind that Ontario is offering, not only for their immediate benefit, but also for the self-reinforcing culture of Energy Managers that can be established.

## References

- AEP Ohio. 2017. "Continuous Energy Improvement." Accessed March 17.  
<https://www.aepohio.com/save/business/programs/ContinuousEnergyImprovement.aspx>
- BC Hydro. 2017. "Energy Manager Program" Accessed March 17.  
[http://www.bchydro.com/powersmart/business/programs/energy-manager.html?WT.mc\\_id=rd\\_energymanager](http://www.bchydro.com/powersmart/business/programs/energy-manager.html?WT.mc_id=rd_energymanager)
- BPA (Bonneville Power Association). 2017. "Energy Efficiency Energy Management" Accessed March 17. <https://www.bpa.gov/EE/Sectors/Industrial/Pages/Energy-Management.aspx>
- Efficiency Nova Scotia. 2017. "Onsite Energy Management" Accessed March 17.  
<https://www.energyncs.ca/energy-planning-management/onsite-energy-management/>
- ETO (Energy Trust of Oregon). 2017. "Strategic Energy Management" Accessed March 17.  
<https://www.energytrust.org/industry-agriculture/industry-strategic-energy-management/>
- NYSERDA (New York State Energy Research and Development Authority). 2017. "PON 3334 On-site Energy Manager" Accessed March 17. <https://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/PON-3334-On-site-Energy-Manager>
- NYSERDA (New York State Energy Research and Development Authority). 2017. "PON 3411 Industrial Strategic Energy Management: Pilot Solicitation" Accessed March 17.  
<https://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/PON-3411-Industrial-Strategic-Energy-Management-Pilot-Solicitation>

PSE (Puget Sound Energy). 2017. "Resource Conservation Manger" Accessed March 17.  
<https://pse.com/savingsandenergycenter/ForBusinesses/energy-management-programs/Pages/Resource-Conservation-Manager.aspx>

Watson Marketing. 2016. *2016 Email Marketing Metrics Benchmark Study*.  
<http://www.smartinsights.com/email-marketing/email-communications-strategy/statistics-sources-for-email-marketing/>