



Bonneville Power Administration

Process Evaluation of the Strategic Energy Management Offering

Submitted by Evergreen Economics

FINAL REPORT

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1 EXECUTIVE SUMMARY

This report presents the results of a process evaluation of the Bonneville Power Administration's (BPA's) Strategic Energy Management (SEM) offering within its Energy Smart Industrial (ESI) energy efficiency program. SEM is a process in which participating facilities learn energy management techniques and receive tools to identify ways to make their facilities' equipment, operations, and user practices more energy efficient. BPA has made available a version of this offering to its utilities and their industrial end-users since 2010.

Evergreen Economics—together with Apex Analytics—conducted this evaluation in late 2021 and early 2022 to assess how the offering was functioning and how it was received, and to identify any areas of improvement BPA and its implementation contractors should consider. Specific evaluation objectives focused on how end-users were engaging with SEM and adopting SEM practices, the value proposition for industrial end-users and for utilities, results from industrial end-users' participation, opportunities to increase effectiveness of the offering's delivery, and opportunities to expand the offering to more recipients.

Results from the evaluation are based on 53 interviews with staff from BPA's program group, customer utilities, industrial end-users, and regional stakeholders.

Conclusions we drew from the research and associated recommendations are:

The SEM offering leads participants to operational energy savings, creates organizational awareness of energy savings, and is effectively managed.

Utilities and industrial end-users reported that the SEM offering results in operational energy savings. End-users further described increased awareness of energy use in their facilities as a primary benefit of participation as well as non-energy benefits such as opportunities to gain recognition and build relationships across their organizations. Utilities reported that the SEM offering allows them to understand their customers' businesses better and to communicate with them more frequently. Additionally, industrial end-users and utility staff were complimentary of the ESI program's delivery of the SEM offering, often highlighting the valuable role of the Energy Smart Industrial Partners (ESIPs) and other program delivery staff (TSPs or Technical Service Providers) to provide both strong technical advising on industrial processes and support for cohorts and energy management plans, as well as ongoing encouragement.

SEM also leads to additional energy savings achievements via capital projects, "spillover" into other facilities, and a focus on other environmental benefits.

Through building an increased awareness and organizational commitment to energy savings, both utility staff and end-users reported many "spillover" benefits after participating in SEM. Industrial end-users reported an increase in capital projects. They also reported applying concepts they learned through SEM at other existing facilities, in new facilities, and even in their own homes. End-users also noted that their energy management activities contributed to their organizations' sustainability goals, such as solid waste reduction and greenhouse gas emissions.

To better leverage these spillover effects, we suggest that the ESI program:

- Consider ways to encourage and track SEM participants' application of energy management in other facilities.

- Consider a streamlined version of SEM for facilities associated with participating end-users or ones that already have an entrée to SEM-appropriate energy management activities.
- Consider highlighting these broad benefits of energy awareness in SEM marketing.

The time commitment for SEM can be daunting, but once participants have committed their organization to making use of the offering, they find the effort associated with cohort meetings and energy management plans to be valuable.

Interviewed utility and ESI program staff reported that the time commitment required to participate in SEM was a barrier for some facilities. Industrial end-users also reported that the time commitment had been an initial concern when they learned about SEM. However, end-users reported that cohort meetings are an extremely valuable element of the SEM offering, and taking the time to create energy management plans has inherent value. Once they had experienced the benefits of SEM, end-user participants reported the effort required was justified.

To promote participation by end-users who would benefit we recommend that the ESI program:

- Develop additional outreach materials designed to demonstrate the value and potential for operational energy savings associated with SEM participation in end-user facilities.
- Investigate ways to best integrate virtual elements, which provide logistical benefits to the program and reduce travel time and costs for participants, with in-person elements, which participants value for the social interaction and applied demonstrations they provide, to optimize the cohort delivery process.

Staff capacity and turnover are key barriers to SEM efforts, which exacerbates the natural tension between SEM and other business priorities.

Industrial end-users reported that staff capacity and turnover were both significant barriers to participating in SEM or fully addressing energy management opportunities. Staff turnover can lead to a loss of organizational focus on energy savings. End-user interviews also indicated, however, that SEM could support staff transitions. Staff capacity constraints is also an issue for utilities; they often do not have the resources to recruit and educate customers on SEM. Additionally, staff turnover at utilities can lead to a loss of knowledge, which can be a barrier to recruitment.

To alleviate staff capacity constraints and promote continuity through staff transitions at end-user facilities, we suggest that the ESI program:

- Consider opportunities to further leverage the Energy Project Manager offering¹ to ease staff capacity constraints by participants in the SEM offering.
- Consider improving staff transitions by setting up SEM materials and through added training for the transfer of knowledge.

Maintaining operational energy savings requires ongoing monitoring and commitment, yet some end-users stop using energy management software when their SEM engagement ends.

Interviewed industrial end-users indicated that most of the operational changes they had made as part of their SEM engagement remained in place. Nonetheless, interviews indicated that barriers to SEM energy savings persistence exist, such as staff turnover, capacity, and a loss of energy monitoring capabilities. Ten of 15 end-users reported they had stopped using the Energy Sensei

¹ The Energy Project Manager offering is a parallel measure to Strategic Energy Management. Both are available within the Energy Smart Industrial Program. See the background section of the report.

software that BPA supplies to SEM participants when their engagement ended. Five of these replaced the software with an alternate system, and the remaining five lost the ability to closely track their energy management activities.

To promote post-participation persistence in end-users' SEM and energy-saving efforts, we recommend that the ESI program:

- Prepare SEM participants to better monitor their energy usage independently. This added support could be achieved through additional training, post-program software use, or both.
- Consider a maintenance phase to follow SEM cohort engagement.

In addition, we recommend that the program:

- Review and revise the SEM close-out process at the conclusion of a participant's engagement to include more structured feedback that builds on the current completion report. Additions could include structured participant feedback, a check-in with the participant about their next steps, and identification of peers who would benefit from the offering.

2 BACKGROUND

The Bonneville Power Administration (BPA) contracted with Evergreen Economics and its subcontractor Apex Analytics (the Evergreen team) to conduct a process evaluation of its Strategic Energy Management (SEM) offering. As a separate effort, the Evergreen team is also conducting a study to assess the persistence of SEM practices over time. BPA chose to add a process evaluation primarily to inform future adjustments and improvements with a particular focus on improving uptake and effectiveness of the SEM offering, both for its utility customers and industrial end-users.

2.1 INTRODUCTION

Since 2010, BPA has operated an SEM offering within its Energy Smart Industrial (ESI) energy efficiency program to any of its utility customers with interest and a relevant customer base. Utilities choose whether to make the offering available as part of their energy efficiency services to their end-users and can tap into the program delivery provided by a BPA contractor. Utilities have energy-efficiency incentive budgets available from BPA for payments to participating end-users.

2.1.1 PROGRAM DESCRIPTION

SEM is an energy efficiency concept that is commonly used to serve industrial end-users with varied loads and efficiency opportunities. Instead of directing end-users to specific solutions and technologies as most energy efficiency programs do, SEM is a process for continuous improvement. To do this, SEM employs energy champions to institute energy management approaches, to identify and pursue energy-saving (and process-improvement) adjustments, and to institute an organizational culture. Energy savings may be achieved through equipment replacements (funded as “capital projects” through custom industrial programs), operational and maintenance practices, or process improvements. The activities and the resulting savings may be centralized or diffuse. Participants are offered training and technical support as well as financial incentives based on estimated savings associated with in-facility changes that result from participation.

Recruitment

End-users first engage with SEM when utility staff or ESI program staff, also known as Energy Smart Industrial Partners (ESIPs) recruit them to participate in a cohort. At some utilities, there are key account personnel who work closely with industrial end-users to engage them in any industrial program offerings, including SEM, while at others, ESIPs handle most of the recruitment and education to engage an end-user.

Cohort Approach

BPA primarily delivers the SEM offering through a cohort approach, in which representatives from end-user facilities come together to participate in workshops. In some cases, cohorts consist of similar types of facilities (e.g., wastewater treatment plants) or facilities with similar types of equipment (e.g., large refrigeration systems), allowing the ESI program to bring in experts on specific processes or equipment types. In other cases, cohorts may include a more diverse mix of industrial facilities. During the COVID-19 pandemic, the ESI program began conducting SEM cohorts remotely, through video conferencing software, rather than gathering all cohort members for in-person meetings as they had previously done. More recently, the ESI program has adopted a hybrid model for its SEM offering in which it continues to hold cohort meetings virtually but has returned to in-person meetings with SEM coaches and onsite opportunity scans. Large facilities may also participate in SEM individually, working directly with program staff (ESIPs and TSPs [or Technical Service Providers]) without engaging with a cohort.

Energy Management Plans

Cohort workshops guide participants through the process of identifying and prioritizing energy management opportunities,² which they document in their energy management plans.³ The SEM process also develops baseline energy usage models and helps participants track energy savings resulting from the energy management activities they undertake. The offering includes a software package called Energy Sensei to help participants track energy savings, although participants can opt for other energy management software packages if they choose.⁴

Industrial end-users participate in the SEM offering in two-year engagements, with cohort workshops occurring most frequently during the first year and a focus on implementing energy management opportunities during the second year. Facilities with remaining energy savings opportunity can re-enroll in the offering when their initial two-year engagement ends.

Energy Smart Industrial Staff Support

In addition to cohorts and energy management plans, contracted ESI staff members also support the utilities and end-users engaged in SEM. ESIP staff work as a single point of contact for industrial facilities to address a wide range of energy efficiency offerings, including rebates for capital improvements as well as SEM. TSP staff include coaches who lead SEM workshops and subject-matter experts on industrial subsystems.

Energy Smart Industrial Program Integration

SEM is one of multiple components that make up BPA's ESI program for industrial end-use customers. Participating industrial end-users can leverage other program elements in addition to SEM, including:

- Custom project incentives for capital improvements;
- Energy Project Manager, which provides co-funding for an end-user employee or contractor to manage energy efficiency improvements in the end-user facility; and
- TSPs to support developing and completing efficiency projects.

ESIPs work with industrial end-users to identify, and support their participation in, the program elements with the greatest potential to benefit their facilities.

2.2 EVALUATION OBJECTIVES

In consultation with BPA staff, the Evergreen team identified six research objectives for this evaluation:

- Understand how end-users are engaging with SEM and adopting SEM practices within their organization
- Determine the value proposition for industrial end-users to participate in SEM
- Determine the value proposition for utilities to engage with SEM
- Assess the results of SEM engagement for utilities and end-users
- Identify opportunities to increase the effectiveness of program delivery

² Energy management activities may include changes to the way equipment is operated to reduce energy use (operational changes), behavioral changes, and capital improvements.

³ SEM energy management plans primarily target operational and behavioral opportunities. Unlike the Comprehensive Site Plan, which is developed as part of ESI's Energy Project Manager offering, they are not submitted to utilities or BPA for formal review.

⁴ The Energy Sensei software also includes project management tools to support energy management activities.

- Determine what opportunities to expand uptake of the SEM offering

Each of these objectives is associated with more specific research questions, listed in Appendix A.

2.3 METHODOLOGY

To address this evaluation’s research activities, the team interviewed ESI program staff and regional stakeholders, participating and non-participating utilities, and end-users to ensure a wide coverage of perspectives for this evaluation. Interviews with utilities and end-users followed an approved utility notification package to ensure appropriate communication between the Evergreen team and interviewees. This section reports on the sampling, audience, and topics for these interviews.

2.3.1 STAFF AND REGIONAL STAKEHOLDER INTERVIEWS

The Evergreen team conducted interviews with ESI program delivery staff and regional stakeholders from September through November of 2021. Program staff respondents included both ESIPs and TSPs. Interviewed regional stakeholders were managers of other SEM programs operating in the Northwest. In total, the Evergreen team conducted 13 interviews (eight with program delivery staff and five with regional stakeholders). Table 1 summarizes interview respondents by role. The interviews were conducted via video conference, and each lasted approximately one hour. The discussion guide for these interviews is attached as Appendix C.

While there was not a formal document review, we did examine the implementation manual for the SEM offering, the prior ESI evaluation report, and the SEM completion report template.

Table 1: Staff and stakeholder interview respondents by role

<i>Population</i>	<i>Role</i>	<i>Number of Respondents</i>
Program Staff	ESI program management	2
	Cascade Energy ESI staff (ESIPs)	3
	Cascade Energy TSPs	3
Regional Stakeholders	SEM Program Managers (Energy Trust of Oregon, BC Hydro, NEEA, Idaho Power, PacifiCorp)	5
Total		13

2.3.2 UTILITY INTERVIEWS

The Evergreen team conducted 14 one-hour interviews of utility staff (11 with participating utilities and 3 with non-participating utilities) via video conference. As shown in Table 2, we

ensured inclusion of utilities with both high and low levels of industrial savings⁵ as well to ensure we would hear a wide set of perspectives reflecting a range of SEM opportunities.

Table 2: Utility staff interviews by group

<i>Participation</i>	<i>Industrial Energy Savings</i>	<i>Number of Interviewees</i>
SEM Participant	High	7
	Low	4
Non-Participant	High	1
	Low	2
Total		14

Interviewed staff members were often heads of departments, other key personnel in the energy efficiency and management departments, or key account managers for industrial customers. Interviewees represented utilities with various levels of participation and industrial energy savings and varied in their own years of experience and familiarity with the SEM offering. Thereby, utility interviewees providing an array of experiences to draw from for this evaluation. The discussion guide for these interviews is attached as Appendix B.

2.3.3 INDUSTRIAL END-USER INTERVIEWS

The Evergreen team interviewed representatives of 26 industrial end-user facilities that had participated in the SEM offering. Interview respondents were primarily site-level managers who acted as champions for energy management activities in their facilities. Interviews took place between April and June of 2022 and lasted, on average, approximately 45 minutes each. To capture a diversity of perspectives on the offering, the Evergreen team stratified interview respondents by their tenure with SEM. Table 3 summarizes the industrial end-user groupings and lists the number of interviews completed with each group.

Table 3: Industrial end-user participant groups and interview sample sizes

<i>Group</i>	<i>Description</i>	<i>Population Size</i>	<i>Interviews Completed</i>
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⁵ Based on distribution of industrial savings across utilities, we define high industrial savings as average annual industrial savings for the 2018-2021 period greater than 0.4% of total 2019 industrial aMW sales based on program records.

New Participants	Participants currently participating in their first two-year SEM engagement	15	11
Ongoing Participants	Participants who have completed their initial two-year engagement but remain involved with the offering	18	9
Past Participants	Participants no longer actively involved with the offering	52	6
Total		85	26

Table 4 shows the time periods during which interviewed industrial end-users completed their formal participation in SEM cohorts. We present this information as an indicator of the iteration of the offering that interviewees experienced and on which they commented. The current two-year cohort approach was piloted in late 2014 and ended in late 2016. The transition from a pilot multi-year industrial energy management offering to a non-pilot industrial SEM two-year program offering took place in 2016, meaning that all interviewees experienced the current SEM structure.

Table 4: Industrial end-user interviewees' last year of participation

<i>Last Experienced SEM Offering</i>	<i>Number of End-User Interviewees</i>
2017	2
2018	5
2019	7
2020	1
2021	8
2022	3

As the objectives of this evaluation focus on identifying potential improvements for the SEM offering, the Evergreen team prioritized new and ongoing participants—who have more recent experience with SEM—in sampling. With the largest population and lowest sampling priority, we created a limited sampling frame for past participants in order to reduce the potential for non-response bias and limit the burden placed on industrial end-users. The sampling frame was made up of a random selection of 12 past participants located west of the Cascades and 12 past participants located east of the Cascades for a total of 24 past participant end-users that received invitations to complete interviews.

The industrial end-users the Evergreen team did not interview were most often ineligible for interviews for one of two reasons. First, the team did not reach out to any end-user participants included in the sample for the SEM persistence study happening concurrent to this study. Second, at a notable number of sites, no respondents with experience of the facility's involvement in SEM were

available, either due to staff turnover or because the facility had closed or changed ownership. Table 5 summarizes the disposition of the Evergreen team’s interview outreach efforts. The discussion guide for these interviews is attached as Appendix D.

Table 5: Industrial end-user participant interview disposition

<i>Participation status</i>	<i>Completed interviews</i>	<i>Ineligible – Facility included in SEM persistence study</i>	<i>Ineligible – Facility closed or SEM staff no longer present</i>	<i>Did not respond</i>	<i>Not sampled</i>
New	11	1	0	3	0
Ongoing	9	5	6	0	0
Past	6	8	6	6	26
Total	26	14	12	9	26

3 RESULTS

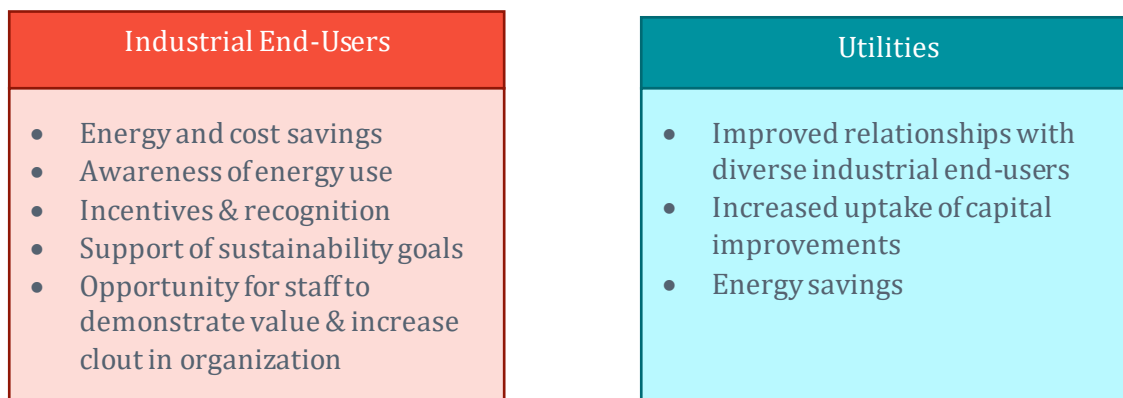
This section reports on the main findings from the Evergreen team’s data collection activities. The first section details the value proposition and barriers to participation from the perspective of utilities and industrial end-users. Next, the report provides findings on specific program elements. Finally, the report synthesizes implications for SEM outcomes for all stakeholders.

3.1 VALUE PROPOSITION AND BARRIERS TO PARTICIPATION

3.1.1 VALUE PROPOSITION

Figure 1 summarizes SEM’s value proposition as reported by industrial end-users and utilities. The following sections provide additional detail on the value of the SEM offering to each group.

Figure 1: SEM value proposition



INDUSTRIAL END-USERS

Industrial end-users described a variety of benefits of participating in SEM, including the energy and cost savings in their facilities and an increased awareness of energy use and savings opportunities that they could apply in other facilities. Industrial end-users also described a variety of non-energy benefits of SEM participation, including the potential for their SEM-related efforts to contribute to sustainability goals or other continuous improvement efforts and opportunities for site-level management to demonstrate their value and increase their clout in the organization

Energy and Cost Savings

Interviewed industrial end-users most often reported that their organization’s leadership supports their participation in SEM, and interview findings suggest that energy and cost savings are a key driver of that support. As one respondent stated, “our management is very open to any opportunity to save energy or money, very excited about it.” Interviewed end-users reported that the offering’s tracking of energy and cost savings had helped them gain their leadership’s support for energy management activities. Program staff and regional stakeholders recognized the importance of demonstrating early energy savings in building and maintaining support for energy management within industrial facilities. As one regional stakeholder explained, “getting people excited is key. The small wins too, gaining their trust, having a list of opportunities, something they can try and get results pretty quickly, so they can see the value.”

A majority of respondents (16 of 26) reported that the energy savings they achieved through SEM exceeded their expectations. According to one respondent, their facility’s energy savings were “much higher [than expected], we’re blown away. We did not realize how much we could save.”

Two respondents further noted that the cost savings they achieved from even a small percentage reduction in energy use were greater than expected. As one explained, “you may only be saving 2%, but look at your energy bill and how much you spend in a year, and 2% could be pretty substantial. It could be a couple hundred thousand dollars.” Only three respondents reported the energy savings they achieved through SEM fell short of their expectations.

Awareness of Energy Use and Expansion

Interview findings suggest that building an awareness of energy use and savings opportunities is a key benefit that industrial end-users take away from the SEM offering. A large majority of respondents (21 of 26) cited energy awareness as a benefit of SEM in open-ended responses. In a representative comment, one respondent said, “I think it was very eye-opening. I definitely take a different view when I walk into new areas, and things stand out to me that never would have in the past, specifically through this program.”

Leveraging the energy awareness participants gain through their SEM participation may provide an opportunity for the ESI program to expand SEM uptake. Eight respondents reported applying the energy awareness they gained through the SEM offering to find energy savings opportunities in other facilities their organizations owned or where they worked. For example, municipalities reported applying concepts they learned through SEM at their water or wastewater treatment plants to other municipal buildings such as the police station and library. Two respondents also reported taking action to save energy in their homes, inspired by their SEM experience.

Support of Sustainability Goals

Interviewed end-users also often reported that their SEM participation contributed to their corporate sustainability goals, further helping to gain leadership support. One end-user explained, “SEM opened the door to us engaging with the leadership team, and we have really fostered a strong relationship with the [division] leadership team because of SEM...It has opened doors for us on other environmental fronts,” such as solid waste reduction and greenhouse gas emissions. Program staff noted that industrial end-users motivated by corporate sustainability goals or other continuous improvement efforts were often the most successful, as those goals could help justify resources and support from the organization’s leadership.

Opportunity for Staff to Demonstrate Value and Increase Clout in Organization

Interview respondents were primarily site-level managers who acted as champions for energy management efforts in their facilities. To several of these respondents, the energy cost savings and contribution to sustainability goals that SEM participation provides offer an opportunity to demonstrate the value of their work and increase their clout in their organizations. Interviewed end-users valued recognition of their energy management efforts, and seven out of twenty-six respondents said that a key benefit of this recognition was in drawing attention to their efforts among their organization’s leadership. As one respondent working in a municipal facility explained, “It is valuable as far as being a supervisor and an operator, just to know the work you are doing is valued and is noticed. It is also valuable from a standpoint of funding for the future from [the] City Council...they are more apt to OK some of the funding knowing that we are doing these steps for the greater good of the city.”

Interviewed end-users also valued external recognition for their energy management efforts, with 12 respondents reporting they had received some type of external recognition. Respondents from municipal facilities in particular noted that this recognition reflected positively on their organization, with one respondent noting that recognition “would shine a better light on our

organization as far as efficiency in a publicly-run organization." A respondent from a private manufacturer reported that they would promote any recognition received for energy management efforts to their customers and potential customers.

Interviewed industrial end-users also frequently (9 of 26 respondents) discussed the importance of SEM incentives in the context of recognition for their energy management efforts. Three respondents reported that program staff had held ceremonies presenting them with large, novelty incentive checks as a recognition of their efforts, which had captured the attention of internal stakeholders. As one respondent described, "The money is the bottom line. Any other kind of recognition would be secondary to getting my picture, or somebody here getting their picture, taken with a check." This respondent and three others noted that the incentives they earned were not allocated to their divisions directly—instead they went into organizational-level general funds—making the recognition the incentives brought a primary benefit.

UTILITIES

Improved Relationships

Nearly all interviewed utility staff (10 of 11 participating utilities) reported that SEM improves their relationships with their industrial end-users by adding structure to their interactions, allowing utility staff to learn about each customer's specific processes, and by providing engineers that can bridge the gap between the utility and the end-user. As one utility staff member stated, "Prior to SEM, [utility] didn't have much of a relationship [with some end-users]. SEM opened the door to two-way conversations to understand their business and how to support them in other ways...which will in turn help them beyond conservation programs and make it easier for demand response interventions."

Participation in SEM provides structure for utility staff and end-users through initial kick-off calls for SEM engagements and regular communication with ESIPs about industrial customers' progress and recruitment. Most utility staff interviewed had direct interactions with end-users (8 of the 11 participants) and reported that ESIP facilitation was valuable for keeping the utility up to date on SEM. Utilities that reported more direct and frequent interaction with industrial end-users were more likely to report that SEM strengthens their relationships.

Increased Uptake of Capital Projects

In addition to improving relationships with industrial end-users, utility staff reported that SEM engagements often led to increased capital projects. As one utility staff member stated, "Yes, it provides good savings, but it's largely a customer service component... because we're able to provide resources to look at processes in depth. I firmly believe this is why we see so many more capital projects from these sites, because of the education piece." Having ESIPs who understand the end-users' processes and who can speak the same language was also mentioned as incredibly important to identifying and pursuing additional capital projects that may have been unknown to both the utility and the end-user prior to SEM engagement.

Energy Savings

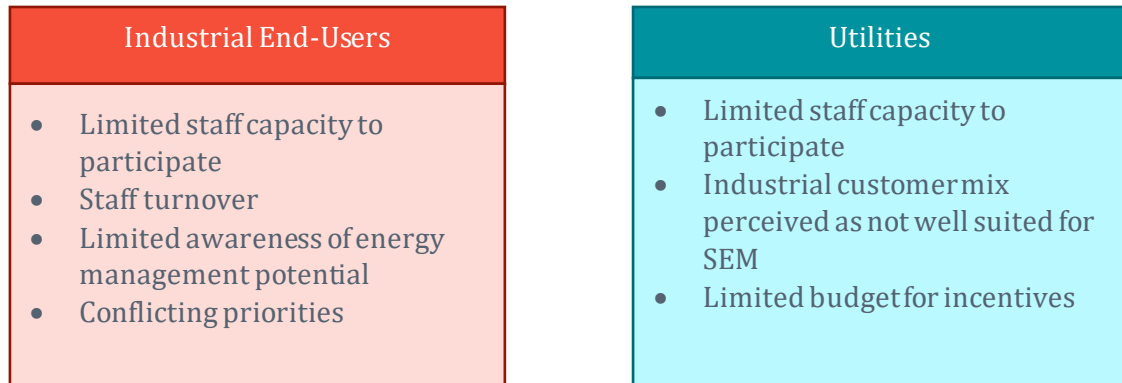
Most utilities did not mention energy savings as a benefit of the SEM offering directly, but did recognize that savings through participation drives end-user engagement and interest in SEM. With a few exceptions, utility staff see the offering as a win-win for their end-users to have the opportunity to save energy through low- to no-cost interventions through SEM.

Additionally, ESI program staff also reported that, while in the past, utilities had been skeptical of the SEM offering’s behavioral and operations and maintenance-based energy savings, they now rarely encounter these concerns. According to one respondent, “We’ve got utilities that, five years ago, would not touch SEM, [but are now] contemplating it and looking to step into it.”

3.1.2 PROGRAM BARRIERS

The following sections provide detail on the most common barriers to participation and/or full program engagement from the perspective of industrial end-users and utilities. Figure 2 summarizes the findings, and details follow.

Figure 2: SEM barriers



INDUSTRIAL END-USERS

Interviews with industrial end-user participants identified four primary barriers to participation in the SEM offering: end-user staff capacity, staff turnover within end-user organizations, a limited awareness of potential savings from energy management, and conflicting priorities within their facilities.

Limited Staff Capacity to Participate

Internal capacity constraints, particularly staff time, was the most common concern participating industrial end-users reported upon learning about the offering and the most common challenge they reported in their participation. Several respondents noted that only a few staff members within their organizations, and in some cases a single person, were tasked with energy management efforts. Seven interviewed end-users cited staff time requirements as an initial concern with the offering. In a representative comment, one of these end-users said, “We were a little apprehensive, looking at the schedule, saying it is another meeting we will have to go to... it is another thing [the operations supervisor] wants us to do.”

Some respondents reported that time constraints became less of a concern as they became more familiar with what SEM participation would involve and began to experience the benefits. Nine respondents described energy management and participation activities as having become integrated into their roles, rather than being an added task. As one described, “It is not another thing we have to do, it is part of what we do. Even if I have a staff of 20, I am still going to have to make a choice about what I want to do versus what I have the resources to do.” Three respondents elaborated that the benefits of participation justified the time required, with two noting that the priority they place on energy management activities had increased as they had experienced

benefits. According to one, “it has been a little bit challenging here and there to fit this in, but if you demonstrate the savings, it becomes more important and higher up the list.”

Other respondents reported continued challenges with staff time throughout the participation process, with *time to participate in SEM activities* more often cited as a challenge than *time to carry out energy management efforts within the facility*. Specifically, respondents most often cited challenges with taking the time needed to travel to and attend cohort workshops (7 respondents). As one respondent described, “For me to take a day off and go to class, it can be complicated. Most of the time, we are preventative in our maintenance schedules, so we can schedule stuff to do prior to meetings.” Four additional respondents reported challenges finding the time needed to gather information and complete other assignments between cohort workshops. Section 3.2.2 provides additional detail on end-users’ reactions to the cohort workshops.

Six interviewed end-users reported that time constraints limited their ability to carry out energy management activities such as holding meetings of their internal energy teams and addressing identified energy savings opportunities. Three of these end-users noted that their facilities were particularly busy at the time of the interview, making it difficult to take time for energy management. According to one, “We have so many large projects going on, I don’t have staff I can put on things like looking for air leaks.”

ESI program staff also recognized limited bandwidth and resources as a top barrier for industrial end-user participants. Staff noted that industrial sites often have a limited workforce and limited time to make commitments. As one program staff member explained, there can be “competition between time for something like SEM versus their focus on production, their focus on safety, the typical things you see from industrial customers. Sometimes they are running lean on staff...the time commitment can be daunting.” Program staff members reported that pandemic-related staffing shortages had exacerbated challenges with staff capacity.

Regional stakeholders also indicated that limited participant bandwidth and resources is a common challenge for SEM programs in the Northwest. All five interviewed regional stakeholders mentioned this as a barrier for program participants. One stakeholder explained that a key barrier is “time – everybody is swamped. Everybody doesn’t need another task to do.”

Staff Turnover

Staff turnover has been a challenge for some end-users but can also provide a unique opportunity for SEM to help end-users develop energy management capabilities. Four interviewed industrial end-users reported that staff members who had previously been involved in their organization’s SEM efforts had left their companies, while two additional end-users reported taking over SEM responsibilities from others. One respondent noted that multiple individuals who had been involved in SEM efforts had retired since their organization began participating, and, with the respondent’s own plans to retire, “somebody here is going to have to step up and drive the bus, so to speak. Who will that be? That’s something I have to try to figure out, along with one or two other people here.”

Interviewed end-users also described challenges with turnover beyond their energy teams. Three end-users reported that there had been recent turnover in leadership at their organizations, and they were unsure how their new leadership would prioritize energy management. A fourth end-user described challenges in building a company culture around energy efficiency due to high turnover among production staff.

End-user interviews suggest that the SEM offering can support participants through staff transitions. One respondent who had recently transitioned to a new role reported that involving the new staff member who filled his previous position in SEM workshops and other activities had provided a valuable training opportunity for that new staff member. According to this respondent, “it was an opportunity for the [new staff member] I was working with to get a lot of really good educational experience on operating the system the most economically, what small things to do to save power.” Another respondent noted that the retirement of a staff member who had been reluctant to adopt new practices for energy management had facilitated their organization’s SEM efforts. One end-user also reported that the documentation of energy savings opportunities through the energy management plans and in the program’s Energy Sensei software helped to maintain their organization’s energy management efforts across staff transitions.

Utility interviews also found that staff are aware of turnover challenges at industrial end-user facilities. As one utility respondent put it, “turnover at the customer facility is challenging. Your champion and/or your sponsor can turn over, and you have to start from scratch.”

Conflicting Business Priorities

Interview findings suggest that, while their involvement is critical, it may be most challenging to gain support for SEM efforts from operations staff at the industrial end-user facilities. While energy savings are an important motivator for energy champions and organizational leadership, energy use can be a secondary concern for operations staff. Respondents explained that operations staff are focused on metrics related to production at the facility, whether that is ensuring the water leaving a wastewater treatment plant complies with regulations or maximizing production speed in a manufacturing facility. As one respondent explained, “Once the plant is running successfully, operators do not want to adjust too much because things are running good.” Another respondent noted that operators might overlook energy considerations “because the operators are trying to get the last two feet of speed out of the machine, and they do not recognize they are picking up five cents on the positive side, but they are picking up \$50 on the downside to do it.”

Interviewed industrial end-users described a variety of strategies to overcome operators’ resistance to change and concerns about the impacts of changes on production speed or quality, including:

- Making changes to their operations gradually and testing their impacts on production metrics as well as energy use
- Sharing energy and cost savings results with operations staff
- Generating competition between operations groups to achieve the most energy savings

Respondents stated that operators became more open to change as they saw the benefits of energy management. One respondent described an example: “One manager would come to meetings, sit in the back corner of the room with their arms and legs crossed, and only pipe in to say ‘that’s a terrible idea.’ They took about a year to warm up but have since become an engaged part of the team.”

Limited Awareness of Energy Management Potential

Interview findings suggest that many industrial end-users are not aware of the energy savings potential from behavioral and operational changes in their facilities when they first engage with the SEM offering. Six respondents noted that when they began with SEM, people in their facilities had been somewhat skeptical there would be sufficient energy savings opportunity to justify the effort. As one respondent explained, “we had a pretty low expectation just from ...our thought process of,

you have to spend a lot of money to save. We weren't looking at it from an operations point of view rather than just a total capital cost of replacing different parts and pumps."

UTILITIES

Utility staff interviews with participating and non-participating utilities highlighted three main barriers to participation in SEM: limited staff at the utility to dedicate to the offering's process, the perception that their customers are not well suited for or interested in SEM engagement, and limited budget to pay out incentives.

Limited Staff Capacity to Participate

Interviewees reported that the limited capacity of utility staff to participate in SEM is the main barrier to engagement. Self-described smaller utilities were more likely to report being constrained by staff capacity, while larger utilities were more likely to have a dedicated staff person to lead SEM engagements with industrial end-users. Capacity constraints reported were threefold:

- Utility staff time to file reporting and process incentives
- Time needed to recruit, educate, and help end-users through the SEM process
- Time they would like to spend helping the end-user provide and gather baseline data

As one utility staff member put it, "The process itself can be heavy for a customer. That's where [utility] likes to help out because it is laborious with collecting baseline data, metering, billing data, paperwork... I can see this being an issue for other utilities that don't have the staff to work directly with customers on this."

Interviewed program staff also reported that smaller utilities may have limited staff capacity to engage with SEM and take on any reporting requirements. One staff member explained, "we have so many small utility customers whose one energy efficiency person wears multiple hats. They do their best...but they are time constrained to pull together an SEM cohort in their service territory." Another staff member noted that utilities may not view the effort of engaging with the offering as worthwhile if they have few eligible customers.

Both small and large utilities emphasized the benefit of having ESIPs dedicated to their industrial end-users. ESIPs often take on the role of identifying, recruiting, and educating end-users to engage with, while reporting back to the utility, but the level of utility engagement with the ESIPs varied. Figure 3 describes different utilities' capacity to participate in SEM through the lens of time available and reliance on ESIPs.

Figure 3: Utility staff capacity and ESIP reliance

Time constrained, but reliant on ESIP	Not time constrained, thanks to ESIP support	Not time constrained, not reliant on ESIP
<ul style="list-style-type: none"> • Most common (n=7) • Generally satisfied with ESIP initiative • A few looking to build out utility staff capacity through key accounts program 	<ul style="list-style-type: none"> • Fairly common (n=5) • Very satisfied with ESIP initiative • Some have key account programs • Comfortable with the offering's elements 	<ul style="list-style-type: none"> • Small group (n=2) • One with key accounts team to push industrial ESI forward, one with less engagement

The most common group consists of utilities that report having little time to dedicate to SEM activities, but also report that they are reliant on their ESIP to push SEM engagement forward (n=7). Some of these utilities mentioned wanting to build out a key accounts program to dedicate more utility staff to industrial customers, and others were happy to stay less involved and let the program staff manage day-to-day operations of SEM. As one utility staff member said, “We do the bare minimum as far as approvals and paperwork go, and [ESIP] handles the rest.”

Utilities that did not report feeling time constrained fell into two categories: utilities working regularly with ESIPs and utilities working with minimal involvement from ESIPs. Utilities that reported not feeling time constrained but engaged regularly with program staff were very satisfied with ESIP initiatives and more consistently reported staff support in recruitment and customer engagement as a key benefit to the SEM offering (n=5). This group is also more educated on SEM and comfortable with the offering. Utilities that were not time constrained, but also were not in regular communication with ESIPs, are the smallest group of interviewed participants, with only two utilities. Both utilities have historic engagement through SEM and understand the offerings well. One had a key accounts team to manage most industrial customer interactions and lead them to SEM, while the other emphasized that they do not push to recruit their customers they deem as a bad fit for SEM.

Industrial End-Users Perceived as Not Well Suited for SEM

Interview findings with both participating and non-participating utilities suggest that some do not think their industrial end-users are well suited for or interested in engagement with SEM.

Utility staff members reported three main reasons for this:

- End-users do not have the time and staff availability to dedicate to SEM.
- End-users do not see the value in engaging in SEM, either because they do not see the potential for savings or because the savings and incentives are too low to justify the cost to participate.
- Past participants no longer have remaining energy savings opportunities after an engagement ends.

Staff members at both participating and non-participating utilities cited that the time it takes customers to participate can be a barrier. As one interviewed utility member put it, “to make it worth it, customers have to get a lot of savings for the amount of work it takes to get the baseline data, get metering data, etc. The incentive seems too low for that amount of work... especially if they’re not seeing savings.” However, others mentioned that the data collection and educational process that takes that time are what makes SEM valuable to participants as well.

Utility staff also expressed that there are business factors that affect SEM participation. One utility staff member said, “the plywood industry is going crazy so the last thing they want to do is talk about energy... Trying to use [conversations about increasing load capacity] to promote programs to help, but overall it’s too busy of a time.” Conversely, another utility staff member stated, “if their business is doing well, they’re more likely to be engaged. If they’re stagnant and small, they are not as willing to try.”

The last category of perceived limitations from industrial end-users is for those that already participated in the past but do not see any additional energy savings potential remaining through SEM. One staff member also reported that past SEM participants have backslid after their engagement. To avoid this, utility staff advocated for a maintenance phase for graduates of the SEM program to keep customers engaged. Although energy savings may be low, they would still receive the benefits of participating in the cohorts and staying in touch with the utilities. Additionally, new participants to SEM would benefit from keeping past participants in cohorts.

Limited Budget for Incentives

Interviews with utility staff found that limited budget for incentives was a concern for a few utilities. Two interviewees mentioned that they have declined to pursue SEM engagement with an interested customer because they did not have the budget to pay out the incentive. One non-participating utility said that they were considering SEM for an interested customer, but that they “haven’t had time to sit down and make sure it fits into the budget and doesn’t take away from other activities.” Program staff noted that BPA allows utilities with these types of budget concerns to set caps on the annual incentive amounts they offer to end-users for SEM energy savings, but utilities may not be aware of them.

3.2 EXPERIENCE WITH PROGRAM ELEMENTS

Both utility staff and end-users are generally satisfied with the SEM offering. End-users particularly valued their experience with SEM workshops and energy management software and had positive feedback about their interactions with program staff. This section walks through the offering’s elements and highlights successes and opportunities for expansion.

3.2.1 RECRUITMENT AND MARKETING

Interviews found that due to staffing constraints, utilities often relied on ESIPs to educate and recruit their end-users into SEM. A representative comment from staff interviews reported that ESIPs were “really great partners and responsive,” and another said, “[they are] my go-to guy to answer any technical question or program question.”

Two utility staff reported that they themselves did not fully understand the offering and had trouble recruiting end-users without ample examples of past SEM engagements. Marketing materials were reported as helpful tools, but that updated materials, more frequent reminders, and industry-specific materials would be helpful for recruiting.

3.2.2 COHORT WORKSHOPS

ESI program staff described cohort participation as a key benefit of SEM engagement for industrial end-users. Staff perceived that participants value the opportunity to discuss their work and engage with their peers. Program staff also noted that the relationships that industrial end-users develop through participation in cohorts were an important benefit of the offering. One staff member described a recent event at which “people were not talking a lot about how much energy they saved. They were proud of [the energy savings they had achieved], but it is easier to tie emotions to your experiences with people. A lot of them were remembering the experience of doing [energy saving] projects with their coworkers.”

Consistent with program staff perceptions, most interviewed industrial end-users valued the experience of attending energy management workshops with a cohort of other facilities. End-users found value in interacting with peers and learning from the actions they had taken to save energy in their facilities. As one respondent said, “I value the opportunity to meet with others who do what I do and face similar challenges and structures as mine.” Several end-users (7 respondents) noted that it was particularly valuable to tour other facilities in person and see the changes they had made. Multiple respondents (5) also reported they found the technical information and resources presented during the cohort workshops to be valuable. Two end-users also noted the workshops were valuable as an accountability tool, ensuring that their facilities kept up with their energy management efforts so they would have progress to report. Interviewed end-users (3 respondents) also noted that program staff did a good job of managing and facilitating the workshops.

Findings from utility interviews suggest that participating in the cohort is valuable for end-users by providing a space to discuss problems with peers, rather than directly with utility staff who may not understand how their business works. One interviewee stated, “talking to someone who really understands their business is really valuable.”

The primary challenge interviewed end-users reported with cohort workshops was related to finding time away from their other responsibilities to attend the workshops and complete the assignments between workshops. A relatively small number of interviewed end-users (3 respondents) also noted challenges related to the need for cohort workshops to address the needs of diverse facilities. These respondents stated that some of the content the workshops addressed was not relevant to their facilities due to differences in facility size or equipment types, or that differences in organizational structure or type impacted the pace at which different facilities could move through the energy management process.

During the pandemic, the ESI program shifted SEM cohort workshops from in-person to virtual meetings. Program staff reported that some elements of SEM delivery, including networking and relationship-building between participants, utilities, and program staff were more difficult without in-person interaction. Several industrial end-users agreed with this assessment (six respondents), reporting that they preferred an in-person approach, citing a greater potential to interact and to do so in a more natural way. As one respondent explained, “I like the in-person meetings better than the virtual ones because you are more interactive with the people speaking, it is easier to ask questions, more intimate, easier to share opinions and see people’s reactions.” One respondent also noted that there were fewer distractions during in-person workshops.

Program staff and end-users also described benefits of online workshops, however. Staff noted that online delivery freed the SEM offering from the geographic constraint of needing to recruit cohorts of participants all located within a reasonable distance of each other. As one program staff member explained, “the geographic closeness of facilities is not a concern in a remote model, or even in a

hybrid model. If you only travel once a year to meet, it is not such a big deal if you have to go a couple of hours.” Four industrial end-user respondents also noted benefits of virtual workshops, primarily in the potential to reduce travel time. Additionally, from interviews with utilities, we learned of two utilities where an interested end-user was put on a waitlist for a cohort and another was denied participation when the cohort filled up.

3.2.3 ENERGY MANAGEMENT PLANS

Interview findings suggest that both the process of creating energy management plans and the plans themselves are valuable to end-users. Seven end-users reported that the process of developing the plan had helped to build energy awareness in their facilities. As one explained, “it was a learning process to look at things differently... We didn’t have much vision on how to manage our energy before.” Another end-user expressed a similar sentiment, saying, “I definitely take a different view when I walk into new areas, and things stand out to me that would never have in the past, specifically through this program.” Only one interviewed end-user reported a negative experience developing their energy management plan, explaining that they had experienced “analysis paralysis,” devoting considerable effort to analyzing their systems without generating any actionable savings opportunities.

As Figure 4 summarizes, end-users most often reported that they continue to use their energy management plan, either consulting it regularly to track progress or on an as-needed basis as the capacity to take on additional energy management activities arises.

Figure 4: Industrial end-user use of energy management plans

4 Respondents	Regularly review plans to assess progress of energy management efforts	<i>“It was used in monthly team meetings to remind people how to operate the facility.”</i>
6 Respondents	Do not review plan on a regular basis, but use it to inform projects and identify next opportunity	<i>“We don’t reference it too often because we are still working on this project, right now. But I could see...referencing back to it to see what our next project is.”</i>
3 Respondents	Do not regularly consult plan but incorporate energy management practices into operations	<i>“I say I haven’t looked at it, but we don’t need to because it is actively in our minds. Perhaps we are using it without even knowing it.”</i>
3 Respondents	Do not regularly use plans: completed all actions listed	<i>“If we had 20 corrective actions, and we got 20 completed, my expectation is that we are at 100%, we got it done.”</i>
3 Respondents	Do not regularly use plans: Unaware of plan	<i>“I really don’t remember that much about it..”</i>

End-users described benefits in formally documenting energy management opportunities in their plans. Two end-users noted that the plans helped to spread awareness of energy management more broadly through their facilities, making it easier to coordinate actions between plant operators and to hand off energy management activities when staffing changes occur. Two additional end-users noted that the analysis and prioritization in their energy management plans helped gain leadership support for changes in the face of reluctance from other staff. As one end-user stated, “having that plan and prioritization to show the potential savings of turning [that equipment] off allowed leadership to push on the equipment services team to make that change.”

3.2.4 ENERGY MANAGEMENT SOFTWARE

Energy management software is a valuable element of the offering for participating industrial end-users, but many facilities do not maintain energy management software after their engagement with SEM ends. The offering provides interested participants an energy management software tool called Energy Sensei, which was the most common energy management software package that interviewed end-users reported using, with 15 of 26 interviewed end-users using it during their SEM engagement.⁶

Energy Sensei is available to participants outside of the SEM offering, but most of the participants that used Energy Sensei (10 of 15) reported they had stopped using it after their engagement with SEM ended.⁷ Half of those respondents (5 of 10) reported they had either adopted other software packages (2 respondents) or developed in-house tracking tools (3 respondents) to monitor their energy use.

While interviews did not probe directly into why these respondents had stopped using Energy Sensei, interview findings suggest a range of motivations. One respondent reported that their facility had been acquired by a parent company that used a separate energy management software package across all their facilities. Another noted that they had developed a tracking spreadsheet to monitor usage across all of their facilities that use significant amounts of energy, not just at the facility that participated in SEM. A third reported that they had investigated energy management software tools but did not believe the incremental benefits those systems provide above an in-house tracking spreadsheet would justify the costs. According to this end-user, “If you are tracking hundreds of points, you are going to be spending so much time analyzing that you will have data overload, as opposed to just identifying opportunities and taking care of them.”

The remaining respondents were not actively using energy management software at the time of their interviews. These respondents indicated that monitoring their energy use would be challenging without SEM support in consolidating and entering their energy usage data. Two respondents reported they would like to continue using Energy Sensei or develop similar tools of their own but had not yet been able to do so. According to one, “I would have liked to have

⁶ In addition to Energy Sensei, respondents reported using other software packages (6 respondents), tracking tools they developed in-house (4 respondents), or were not aware of an energy management tool in use in their facility (5 respondents).

⁷ The five end-user participants who did not report they had moved away from Energy Sensei were all either still engaged with SEM or had very recently been engaged with the offering at the time of their interviews.

developed an in-house tool to do what the Sensei tool was doing. That is still on my list, but I haven't been able to get to it with competing priorities.”

Industrial end-users described three key benefits of energy management software:

1. **Monitoring energy use and assessing energy management activities** (8 respondents): Interviewed end-users reported that energy management software had helped to increase the visibility of energy use within their facilities, allowing them to better monitor energy use and see the effects of their energy management efforts. As one end-user explained, “A lot of the projects that we have gotten are things that cannot be set one time and just forgotten. There is a lot of tweak and peek, or go back to seasonal changes, and things like that. So the Sensei program helps with that accountability factor.”
2. **Tracking progress of energy management activities** (6 respondents): The Energy Sensei software product, which the program offers to participants, allows users to maintain a list of identified energy management opportunities and track the steps they have taken to address those opportunities. End-users reported using this functionality as a project management tool to review progress with internal staff, communicate with program staff, and facilitate transition of energy management responsibilities to new staff members.
3. **Communicating the importance of energy management** (6 respondents): End-users described using the output of their energy management software to demonstrate concrete benefits of energy management activities both to their organization's leadership (“It made the communication upward to my plant manager and outside of the plant nicely packaged”) and to staff within their facilities (“It is good to show [other operators] Sensei and see what is going on...it seems like everybody is in head first. They want to make adjustments to see that savings.”).

The most common improvement that interviewed end-users sought in their energy management software was an ability to track data closer to real time. Three interviewed end-users elaborated that they use monthly utility billing data to update their energy management tracking systems. As a result, it could take one or more months for them to see the effects of energy management changes. According to one end-user, “You are making all these changes and [tracking] is delayed, you don't know right away how much everything is saving or if it's good or bad.” Other end-users sought more granular monitoring by end-use or portion of their facility or greater automation in the process of entering energy usage data into their systems.

3.2.5 PROGRAM STAFF ENGAGEMENT

Interviewed industrial end-users provided largely positive feedback about their interaction with their ESIPs and SEM program staff. Respondents reported that program staff were responsive to their needs and enthusiastic about helping them pursue energy savings opportunities. According to one respondent, “Any time there is an opportunity, [program contact] is energetic about trying to get resources, he is enthused and so upbeat about it. If I was having a bad day, I could call him and he would brighten my day.” Another respondent stated, “It's that one-on-one contact, having a passionate, external resource making contact with the right person at the plant in order to instill that passion into somebody at the plant.” End-users reported that regular check-ins with program contacts helped motivate them to prioritize energy management activities.

Interviews with industrial end-users suggest that the outside perspectives that program staff provided and the technical expertise they coordinated were particularly valuable. As one end-user explained, “Sometimes that second set of eyes might see something that I walk right by every day and might be able to save a penny there.” End-users also reported that SEM's engagement with

subject matter experts was valuable, noting that demonstrating technical expertise in their industries or the equipment types in their facilities helped to instill confidence that advice would be relevant to their facilities. One end-user stated that, in their experience with energy efficiency programs, “Often someone comes in and says, ‘if you turned off all your equipment, you would save electricity.’ Yes, but it’s hard to move [inputs] around the [facility] without [equipment]. So, often we are disappointed, but [ESIP name] and ESI were a breath of fresh air, on top of their game, understood and were helpful from the very first interactions.” End-users also noted that SEM’s support in providing technical analysis facilitated internal approval of projects.

Echoing praise from end-users, utility staff interviews also found that the ESIPs and other program staff were integral to engage customers and move SEM forward. One quote that captured the response from utility staff was, “nothing but good things to say about the ESIPs. They do an excellent job of providing knowledge and have a communicative staff. They are great liaisons between the customers and the utility.”

While the response from utilities was mostly positive, there were two utilities that would have preferred the ESIPs to include them more in the process. One utility stated that they felt like they “were in the dark and there were no updates.” Another acknowledged that most utilities prefer and expect the ESIP to take the lead in recruitment, education, and engagement with end-users, but said, “[we] want to be more involved step by step... there were some projects that [we] didn’t even know were happening and [we] weren’t able to fund the incentives so it was problematic.” Notably, the same utility recognized the steep learning curve involved and reported that they have since improved their communication processes with ESIPs to ensure there are no further lapses in communication.

The only challenges that interviewed end-users reported in working with program staff came from two end-users, who reported that their program contacts appeared to be stretched thin. These respondents reported that while their program contacts were responsive, they, at times, had to be reminded about information the end-users had provided in previous communications.

3.3 SEM OUTCOMES

Participating end-users discussed a variety of actions they had taken to save energy in their facilities over the course of their engagement with the program. The SEM offering is primarily focused on, and reports energy savings from, motivating industrial end-users to make operational and behavioral changes in their facilities. Consistent with this focus, operational changes were the most common types of energy saving actions interviewed end-users reported (21 of 26 respondents). Interview findings further suggest that end-users had largely completed the operational savings opportunities identified at their sites, with only one respondent identifying remaining operational savings opportunity.

The types of operational changes end-users reported completing included:

- Adjusting and monitoring controls on pumps and compressors with variable frequency drives
- Turning off redundant equipment when it was not needed (for example when the facility was operating below its full capacity)
- Adjustments to optimize refrigeration systems
- Adjusting compressed air setpoints or addressing compressed air leaks
- Prioritizing more efficient equipment when possible
- Shutting down equipment when not in use

The SEM offering does not pay incentives for capital improvements made in industrial end-users' facilities; end-users receive incentives for capital improvements through other components of the ESI program. Nonetheless, interviewed end-users reported that participating in SEM had helped them identify opportunities for capital improvement projects and understand and access capital improvement incentives. Most interviewed end-users (17 of 26) reported making capital improvements as part of their SEM participation, most often lighting upgrades (12 respondents) and variable frequency drive installations (4 respondents). Respondents also frequently reported that the remaining efficiency opportunities included capital improvements. Upgrades to motor-driven systems such as pumps and aerators were common among the remaining opportunities end-users reported.

3.3.1 SEM PERSISTENCE

Interviewed end-users reported that most of the energy-management changes they had undertaken were still in place. Eight end-users reported that all of the changes they made were still in place, while the remainder indicated that the changes that did not persist represented a minority of their total activity. The reasons end-users cited for reversing energy management activities they had attempted fell into two categories: 1) insufficient support from internal staff, or 2) a negative impact on production. Six respondents reported attempting energy management activities that had not persisted due to insufficient internal support. One respondent explained that staff who prioritize other metrics might change processes in ways that work against energy management efforts. According to this respondent, "You need to compare [potential changes] against all of the cost bases...that is easier to say than to do when you have 300 unique personalities running around trying to do what they think is the right thing."

Five respondents described their energy management efforts as a process of taking incremental steps to reduce energy use (for example shutting down potentially redundant pieces of equipment) and monitoring the impacts of the change on production with the goal of eliminating energy use that does not impact production quality. These end-users indicated that they had reversed incremental actions attempted as part of this process that had a negative impact on production quality.

Making operational changes to actively manage a facility's energy use often increases the level of effort required of facilities staff and equipment operators and is a potential challenge for energy management efforts. Eight interviewed end-users suggested that the operational changes they had made in their facility required ongoing monitoring or other regular action from staff to maintain. As one respondent explained, "A lot of these things...are hard won and easy to regress. You say, 'we're going to optimize this,' and it takes a lot of diligence to get the savings from it. It is easy for people to get lazy and go back to what is easy." Another respondent explained that shutting equipment down at the end of a shift and starting it up at the beginning of the next shift increased the time required of equipment operators. This respondent reported needing to justify the resulting labor costs to others in their organization.

3.3.2 REMAINING OPPORTUNITY

While some respondents described energy management as an ongoing process, a larger number reported that there was limited additional opportunity for energy savings from energy management in their facilities. Six respondents reported that energy management was a continuous process, particularly as new staff and new equipment entered their facilities. In contrast, nine respondents indicated that, as there were few remaining opportunities for operational changes in their facilities, little energy management work remained. According to one respondent, "We're

always looking for ways to save money or energy, but there is not much low-hanging fruit left here at the plant.” Many of these respondents suggested that the remaining energy savings opportunities in their facilities were primarily higher-cost capital improvements. Interviewed utility staff were also aware of this barrier to participation and recommended creating a maintenance phase for “graduates” of the SEM offering.

Planned equipment or facility upgrades may pose a short-term barrier to energy management activities. Six interviewed end-users reported they were planning to upgrade their facilities, develop new facilities, or replace equipment, and suggested they were reluctant to invest time and effort in identifying energy management opportunities and optimizing operations of facilities or equipment that would remain in operation for a limited time. As one respondent explained, “All of our major buildings are going through a remodel, so we are not putting time into our existing equipment in those buildings...The new systems will be much more efficient when they are in place, so it is not cost effective to upgrade these systems before they are changed.”

4 CONCLUSIONS AND RECOMMENDATIONS

This section synthesizes findings from the evaluation to provide conclusions, recommendations, and considerations for BPA's program team. Each conclusion is followed with key findings to support it and recommendations or considerations to build on the strengths or mitigate weaknesses within the SEM offering. Recommendations are more detailed or specific, while considerations are more directional in nature with details best left to the program staff.

The SEM offering leads participants to operational energy savings, creates organizational awareness of energy savings, and is effectively managed.

Interviews revealed that utilities recognize the value of SEM as an energy savings strategy and do not need convincing that operational savings are reliable. Utilities reported that the SEM offering allows utilities to understand their industrial end-users better and to communicate with them more frequently. This was cited as building trust in the utility, which was reported to help with customer engagement with other industrial efficiency program offerings.

Industrial end-users were also largely satisfied with their experience with SEM, with a large majority reporting they achieved their energy savings goals. End-users described increased awareness of energy use in their facilities as a primary benefit of participation; one representative stated, "I think it was very eye-opening. I definitely take a different view when I walk into new areas, and things stand out to me that never would have in the past, specifically through this program." Industrial end-user staff also reported significant non-energy benefits from their participation in SEM, including opportunities to gain recognition and build relationships across their organizations.

Industrial end-users and utility staff were complimentary of the SEM offering's delivery, often highlighting the valuable role of the Energy Smart Industrial Partners and other SEM program delivery staff (such as TSPs) to provide both strong technical advising on industrial processes and support for cohorts and energy management plans, as well as ongoing encouragement. Most utilities interviewed reported that their ESIP provides great value in encouraging SEM engagement and supporting the end-users. ESIPs' efforts to support the recruitment of and communication with end-users often compensated for staff constraints at utilities. ESIPs can educate and recruit end-users as well as help them through the cohort and reporting requirements.

End-users echoed utilities' positive feedback toward program staff, reporting high satisfaction and appreciation for the program staff members. End-users view ESIPs as a resource to support a wide range of energy efficiency improvements in their facilities. As one described, "It's that one-on-one contact, having a passionate, external resource making contact with the right person at the plant in order to instill that passion into somebody at the plant."

SEM leads to additional energy savings achievements via capital projects, "spillover" into other facilities, and a focus on other environmental benefits.

Through building an increased awareness and organizational commitment to energy savings, both utility staff and end-users reported many "spillover" benefits after participating in SEM. Interviewed industrial end-users discussed energy management in a comprehensive way, including capital improvements as a benefit of SEM engagement. End-users noted that the offering had helped them understand available incentives for capital improvements and navigate the incentive process. End-users most often reported completing upgrades to lighting equipment and installing variable frequency drives. Industrial end-users also reported applying concepts they learned through SEM at other facilities in their organization to save energy, other buildings in their municipality, and even

in their own homes. Some end-users also reported drawing on their experience with SEM as their organizations develop new facilities or undertake larger updates of existing facilities. Utility staff mentioned that engagement in SEM opened the door to conversations about other programs, such as demand response, and increased the number of capital projects a facility took on.

End-users also noted that their energy management activities contributed to their organizations' sustainability goals, helping gain support for efficiency from the organizations' leadership. Those relationships with leaders, in turn, had the potential to support additional sustainability efforts such as solid waste reduction and greenhouse gas emissions.

Consideration: The ESI program should consider finding ways to encourage and track SEM participants in applying their energy management knowledge to other facilities at their organizations or municipalities, especially those served by BPA customer utilities.

Consideration: The ESI program should consider opportunities to streamline SEM processes to support facilities with connections to energy management. For example, the program could consider developing a streamlined participation process for experienced end-user staff to conduct energy management activities in facilities that have not yet participated.⁸ The program could also consider streamlining and adapting offerings to integrate with any corporate-level energy management efforts of companies with one or more facilities in BPA utility service territories.

Consideration: The ESI program should consider opportunities to highlight the broad benefits of energy awareness when marketing SEM and promoting it to potential participants, emphasizing that participation may support capital improvements and sustainability goals and provide knowledge that participants can apply to multiple facilities.

The time commitment for SEM participation can be daunting, but once participants have committed their organization to making use of the offering, they find the effort associated with cohort meetings and energy management plans to be valuable.

Interviewed utility and program staff reported that the time commitment required to participate in SEM was a barrier for some facilities. Utility staff reported that attending cohort meetings and developing energy management plans was too time consuming for some of their customers to take on in addition to their daily business activities. Industrial end-users also reported that the time commitment had been an initial concern when they learned about SEM. End-users indicated they did not initially recognize the energy management potential in their facilities, and thus were unsure if the benefits of SEM participation would justify the time commitment required.

Industrial end-users reported that attending cohort meetings and creating and implementing energy management plans was time consuming, and it was occasionally challenging to devote the time needed. However, industrial end-users also reported that cohort meetings are an extremely valuable element of the SEM offering, and taking the time to create energy management plans has

⁸ It is important to recognize that it may not be feasible for the ESI program to provide this type of support in all cases, as participants may apply energy management concepts in facilities that are not served by BPA utility customers interested in and able to participate in the SEM offering. However, ESIPs can encourage energy managers to help their peer facilities by applying the skills they have learned from the SEM offering. ESIPs can also provide referrals to any local SEM, capital, or similar programs offered by the utilities that serve these sister facilities. If there are none, ESIPs could make referrals to the Industrial Assessment Centers (housed at various universities throughout the country) or the Industrial Energy Management Information Center (a US Department of Energy initiative).

inherent value. Once they had experienced the benefits of SEM, end-user participants reported the effort required was justified.

Cohorts are beneficial in providing customers with valuable insights into their business and giving them a space where they can discuss how to improve their operations with peers and program staff. While in-person meetings are preferred, several end-users cited the value of virtual meetings as not needing to commute and take a day away from their facility to attend. Utilities reported that some of their end-users wanted to participate but that the cohorts were full.

Recommendation: To support recruiting and potentially increase participation among end-users for whom SEM is a good fit, the ESI program should develop additional outreach activities and approaches designed to demonstrate the value and potential for operational energy savings in end-user facilities. This could include case studies targeting specific industries (e.g., wastewater) or systems (e.g., refrigeration), inviting representatives from prospective sites on walk-throughs of participating sites when those sites are willing to be featured, or other activities to illustrate potential energy management benefits to prospective participants. These tools would also help end-users better identify the appropriateness of SEM participation for their facilities.

As part of any added outreach activities, the program should consider inviting prospective participants as well as key peer staff and/or management from participating end-user facilities to cohort sessions in which participants report on their SEM activities and results. This experience could help demonstrate the benefits of participation to prospective participants. Including key internal stakeholders from participating end-user organizations could further demonstrate the benefits of energy management to staff in positions to support energy management efforts.

Recommendation: The ESI program should investigate ways to best integrate in-person and virtual elements into the ongoing (post-pandemic) cohort delivery process. In doing so, the program could engage recent SEM participants who have experienced virtual and in-person cohort events to refine meetings into a mixed offering, where some meetings are in-person and others are virtual, to better balance the aspects of in-person meetings that make them valuable with the time savings of remote events. We acknowledge that the program is already piloting a hybrid SEM cohort model, which offers an ideal platform for experimenting with approaches and then obtaining feedback. (See separate recommendation on structured feedback processes.)

Staff capacity and turnover are key barriers to SEM efforts, which exacerbates the natural tension between SEM and other business priorities.

Industrial end-users reported that staff capacity and turnover were both significant barriers to participating in SEM or fully addressing energy management opportunities. Capacity constraints make it difficult for end-users to prioritize attending cohort meetings, following up on energy management plans, and prioritizing energy savings over other business priorities. Staff turnover can lead to a loss of organizational focus on energy savings. The Evergreen team noted multiple instances in which none of the staff members who had been part of the SEM engagement remained at the organization, and the program did not have an updated contact.

End-user interviews also indicated, however, that SEM could support staff transitions. Participating in the cohort process can provide valuable training to educate new staff about optimizing the operation of equipment in their facilities. Energy management plans and project management tools integrated into energy management software also document energy management opportunities and actions taken in a way that can facilitate the transition from one staff member to another.

Staff capacity constraints are also an issue for utilities that reported that they often do not have the resources to recruit and educate end-users on SEM. Additionally, staff turnover at utilities can lead to a loss of knowledge at utilities, which can be a barrier to recruitment.

Consideration: Consider opportunities to further leverage the Energy Project Manager offering to ease staff capacity constraints in facilities with strong SEM potential and highlight this benefit in marketing material. We understand that this is lightly used among SEM participants and BPA intentionally shifted financial energy project manager support to be performance based rather than serve as a process offering. More promotion of the offering to assist with the time commitment that SEM entails may be warranted, including on-boarding, off-ramping, and continuation in a maintenance phase of an end-user's participation, as well as possibly more flexibility on supporting the effort rather than the performance.

Consideration: The ESI program should consider how to implement a staff transition into SEM materials and activities. For example, ensuring that energy management plans contain sufficient detail and energy management activities are sufficiently documented with an eye toward future transitions would help an incoming staff member take on energy management responsibilities with little loss of institutional knowledge. Hard-wiring process and efficiency improvements into the way the end-user does business can help overcome transitions at the leadership or energy manager levels, while ESIPs may be able to provide some support with transitions and advocacy for continuation of SEM-induced changes and a focus on efficiency if they can be introduced to the incoming replacements during planned staff transitions.

Consideration: Consider opportunities to adapt SEM materials and delivery to support staff transitioning into energy management roles to provide some additional or targeted technical training.

Maintaining operational energy savings requires ongoing monitoring and commitment, yet some end-users stop using energy management software when their SEM engagement ends.

Interviewed industrial end-users indicated that most of the operational changes they had made as part of their SEM engagement remained in place. Nonetheless, interviews indicated that significant barriers to energy savings persistence exist. As one respondent noted, operational energy savings are often "hard won and easy to regress. You say, 'we're going to optimize this,' and it takes a lot of diligence to get the savings from it and it's easy for people to get lazy and go back to what is easy." As discussed earlier, staff turnover can contribute to this potential to regress on operational changes as the motivation behind operational changes may be lost as staff with energy management training leave the organization. Even if changes remain in place, continual monitoring and assessment is needed to ensure they remain optimal as a facility's operations shift.

A loss of energy monitoring capabilities poses a further barrier to maintaining operational energy savings. Energy management software is a key tool that enables site-level energy champions to drive their organizations' energy management efforts. The software provides energy champions with concrete, quantitative feedback on the results of their energy management activities. Energy champions use that feedback both to optimize their energy management efforts and to demonstrate the benefits of those efforts to others in the organization – both leadership and facility staff – whose support is needed for energy management efforts to persist. The software can also support documentation of energy management opportunities and activities that help end-users stay on track with their energy management efforts.

Many industrial end-users relied on the program's EnergySensei software package during their SEM engagement. Program staff support end-users in entering their energy usage data into the software to track energy savings. Ten of 15 end-users reported they had stopped using the Energy Sensei software when their SEM engagement ended and the ESI program's support with energy usage data cleaning and entry was no longer available. Five of these end-users replaced the Energy Sensei software with an alternate system, and the remaining five lost the ability to closely track their energy management activities.

Recommendation: The ESI program should investigate ways to better prepare SEM participants to independently monitor their energy usage. These opportunities may be training-based, software-based, or both. There may be opportunities for ESIPs to engage energy champions more in the energy tracking work they currently do for participant end-users and for cohort workshops to incorporate additional elements on how end-users can access and work with their energy usage data so they can more independently track their energy consumption and savings once their engagement ends. There may also be opportunities to adapt the Energy Sensei software to make it easier for industrial end-users to independently enter energy usage data in an ongoing way.

Recommendation: Consider developing a maintenance phase to follow participants' active cohort engagement in which more limited program support would remain available to assist participants in monitoring their energy management efforts and help address any threats to persistence of operational changes.

Recommendation: Review and revise the SEM close-out process that results in an SEM completion report at the conclusion of a participant's engagement to include more structured feedback. We recommend that the close-out process 1) obtain structured feedback from participants about their experience, 2) review steps taken at the facility and outcomes from each major one (as is already included in the completion report); 3) check in with participants about next steps for them and discuss any support the program implementation team or the utility can provide; 4) identify any peers within the participant's company or industry who would benefit from the offering (if those conversations have not already occurred); and 5) model SEM's commitment to continuous improvement. This feedback may require staging during an exit process rather than just a single interaction or creation of a single close-out report. Further, parts of the completion report could be structured as a tool for the participant to promote continuation of useful activities after the SEM engagement and survival through future staff transitions.

APPENDIX A: RESEARCH OBJECTIVES AND QUESTIONS

Table 6: Research objectives and questions

<i>Research Objectives</i>	<i>Research Questions</i>
Understand how end-users are engaging with SEM and adopting SEM practices within their organizations	What growth and advancement opportunities exist for energy champions and energy team staff?
	How persistent are behavioral changes resulting from SEM engagement?
Determine the value proposition for industrial end-users to participate in SEM	What motivates end-users to engage with the offering?
	What elements of the offering provide the greatest value to end-users?
	What value do end-users find in their energy management plans?
	What value do end-users find in performance tracking systems? What role have those systems played in achieving SEM savings and end-user satisfaction?
	What local and national recognition have participants received for their efforts? How has the company benefitted from that recognition?
Determine the value proposition for utilities to engage with SEM	What motivates utilities to engage with the offering? How could existing utilities become more engaged?
	How does the SEM offering affect broader utility industrial program offerings?
	How has SEM engagement contributed to utility- / end-user relationship building?
	What value do utilities find in performance tracking systems? Why are some utilities more open to these systems than others?
Assess the results of SEM engagement for utilities and end-users	How satisfied are utilities and end-users with the SEM offering? How do utilities perceive their end-users' satisfaction with the offering?
Identify opportunities to increase the effectiveness of program delivery	How satisfied are utilities with cohorts, Energy Smart Industrial Partners, and Technical Service Providers?
	What opportunities exist to more effectively manage the offering and streamline SEM processes?
	How satisfied are utilities with BPA communications, SEM team communications, incentives, and marketing materials?

<i>Research Objectives</i>	<i>Research Questions</i>
	How effective are the relationships between program implementers and other key program actors, including utilities and end-users?
	How effectively does BPA coordinate with NW SEM Collaborative and other SEM program administrators in the Northwest?
	How critical is it that SEM is delivered under a single contract with capital improvement projects?
	What program delivery changes could support a shift to a more than one-year measure life?
Determine what opportunities exist to expand uptake of the offering	Which marketing methods are most effective?
	To what extent are utilities and end-users aware of key elements of the SEM offering? What are the most common sources of awareness?
	Why don't more utilities participate with the offering?
	How can BPA motivate more larger industries to return to SEM?

APPENDIX B: SEM PROCESS EVALUATION UTILITY INTERVIEW GUIDE

Note: We refer to SEM as a program in this appendix in order to maintain the original wording of the guide. The term “program” in this guide has the same meaning as the term “offering” in the body of this report.

MEMORANDUM

Date: April 11, 2022

To: Hanna Lee, BPA

From: Ingo Bensch

Re: SEM Process Evaluation Utility Interview Guide

This memo presents a revised discussion guide for interviews of utilities about BPA’s SEM program. As summarized in Table 1, the Evergreen team will seek to interview a mix of participating utilities and non-participating utilities with industrial sales or savings that would suggest viable participation by some end-use customers.

Table 1: End-User Interview Populations

Element	Value	
Data Collection Approach	In-depth interview	
Duration	60 minutes	
Target Respondents	Current participants: Utilities that have end-use customers participating in SEM. Non-participating utilities with high industrial sales and savings. ⁹ Non-participating utilities with high industrial sales and low savings.	
Sample Target	Participants	11
	Non-participants with high industrial sales and savings	3
	Non-participants with high industrial sales and low savings	3

⁹ We defined high industrial sales as 30+ percent of total 2019 electric sales. We categorized industrial savings based on average annual savings for the 2018-20221 period; we classified the savings as high if the annual average exceeded 0.4 percent of 2019 industrial aMW sales and low if it was 0.4 percent or lower.

Element	Value
Sampling Approach	<p>Purposive. We developed and presented a list of the population in each of the three sample groups to BPA’s industrial program team for identification of any unique circumstances that would warrant special consideration. We used the input provided as follows:</p> <ul style="list-style-type: none"> • Avoided two utilities whose viable SEM candidates pose challenges for participation. • Favored utilities whose staff have longer program tenure and participating utilities with a longer history of SEM participation. • Avoided utilities whose staff are new. • Favored non-participants that the program team identified as good candidates for interviews with the expectation that these utilities are ones the program would like to see as participants and whose feedback as non-participants would be highly valuable. <p>After an initial sample pull, we modified our sample to reduce the total number of utilities involved by replacing a few utilities without sampled end-use customers.</p>

Table 2 lists the research objectives these interviews will address and the specific interview questions that will inform each objective.

Table 2: Research Objectives and Associated Questions

Research Objectives	Research Questions	Associated Interview Questions
What is the value proposition for end-use industrial customers to participate in SEM?	What motivates customers to engage with the program?	Q4, Q5, Q6, Q14
	What elements of the program provide the greatest value to customers?	Q4, Q5, Q6, Q19, Q21
	What value do customers find in their energy management plans?	Q22
	What value do customers find in performance tracking systems? What role have those systems played in achieving SEM savings and end-user satisfaction?	Q16
	What motivates utilities to engage with the program? How could existing utilities become more engaged?	Q4, Q5, Q6, Q7

Research Objectives	Research Questions	Associated Interview Questions
What is the value proposition for utilities to engage with SEM?	How do SEM programs affect broader utility industrial program offerings?	Q4, Q5, Q6, Q10
	How has SEM engagement contributed to utility-customer relationship building?	Q7, Q18
	What value do utilities find in performance tracking systems? Why are some utilities more open to these systems than others?	Q16
What are the results of SEM engagement for utilities and customers?	How satisfied are utilities and customers with the program? How do utilities perceive their customers' satisfaction with the program?	Q15
What opportunities exist to increase the effectiveness of program delivery?	How satisfied are utilities with cohorts, Energy Smart Industrial Partners, and Technical Service Providers?	Q15
	What opportunities exist to more effectively manage the program and streamline program processes?	Q13, Q14, Q15
	How satisfied are utilities with BPA communications, program communications, incentives, and marketing materials?	Q15
	How effective are the relationships between program implementers and other key program actors, including utilities and end-use customers?	Q15, Q18
	How effectively does BPA coordinate with NW SEM Collaborative and other SEM program administrators in the NW?	Q15
	How critical is it that SEM is delivered under a single contract with capital improvement projects?	Q15
What opportunities exist to expand the program?	Which marketing methods are most effective?	Q15, Q22
	To what extent are utilities and customers aware of key program elements? What are the most common sources of awareness?	Q9
	Why don't more utilities participate with the program?	Q4, Q5, Q6, Q8, Q13, Q24
	How can BPA motivate more larger industries to return to SEM?	Q24

Interview Guide

Introduction

Thank you for taking the time to speak with me today. *As BPA staff mentioned on the webinar [if non-attendee or non-participant: As we mentioned when reaching out to you to schedule this conversation],* we are conducting a process evaluation for BPA to help them improve the Strategic Energy Management component of the Energy Smart Industrial program, which I am going to call SEM. We are speaking with a selection of utilities, as well as some participating end-users. We would like to learn about...

[for participants: the role SEM plays in your energy efficiency portfolio, your experiences with the program and what you are hearing from your end-use customers, what you see as its strengths and weaknesses, and any ways the program could be improved.]

[for non-participants: your perceptions of the program, any past experiences you may have had with it, what benefits it could provide to your end-use customers, and what would need to be different for you and your end-use customers to make use of it.]

Do you have any questions about our evaluation before we begin?

Finally, I will be taking notes during our conversation. Would you mind if I also record it, just to help with my notetaking? I won't share the recording with anyone, and won't report anything in a way that would identify individual respondents.

Background

Q1. What is your role in [utility's] energy efficiency programs?

- a. How long have you been involved with energy efficiency programs at [utility]?
- b. Is your role for industrial energy efficiency offerings any different from your role for other sectors? In what way?

[for SEM participants]

Q2. What does your work with the SEM program involve? How do you engage with the SEM program and your end-users participating in that offering?

- a. Are there others at [utility] involved with the SEM offering? What do they do?

[for SEM non-participants]

Q3. Does the Strategic Energy Management offering ever come up in your work? How?

Programs

- Q4. Just for context, what key industrial offerings do you currently make available to end-users?
- a. What do these offerings not cover that you think could be useful?

Customers

- Q5. Please tell me about your industrial customer base.
- a. Is it a few large companies or many small ones?
 - b. Is there a dominant industry? What are their main issues / needs?
 - c. What are the most important and/or unique barriers to energy efficiency in that/those industries?
- Q6. How are they responding to your industrial offerings overall? [*Probe on: Why and how do responses vary by industry or type of business, if at all?*]

[if not answered in Q2 above or Q3 above]

- Q7. In what ways do you engage with industrial customers?

Perception of SEM: Fit of the Offering to the Utility's Portfolio and Needs

- Q8. Now, let's talk more specifically about the Strategic Energy Management offering.

[for participants]

- a. For how long have you been participating in SEM?
- b. What led to [utility's] participation in SEM? Was it a decision to offer and promote SEM, a customer request, or something else?

[for non-participants]

- c. As far as you know or recall, have you ever had participation from customers in SEM?
- d. [If no] Why is that? I would be interested in understanding if you haven't had participation because of a choice [utility] made not to offer or promote it, because of lack of interest among your customers, or some other reason.
- e. [If yes] How long ago was that?
- f. [if yes] How did that go?

g. [if yes] Why hasn't there been participation since then?

Q9. If you were to describe to a colleague what SEM is and what it offers in a couple of sentences, what would you say?

a. [For non-participants] Were there any specific information sources that were helpful to you that you would recommend to others who want to learn more?

Q10. How *does* [for non-participants: *would*] SEM fit with your other industrial offerings?

a. How does the offering overlap, complement, or compete with custom or capital offerings? With any other industrial program offerings?

Perception of SEM: Strengths of the Offering

Q11. What do you consider to be the strengths of the SEM offering [for non-participants, add: *as you understand the program or would expect the program to work if you offered it*]?

Q12. Are there ways BPA and the program team could do even more with these strengths or to build on them?

Perception of SEM: Weaknesses of the Offering

Q13. What do you consider to be the weaknesses of the SEM offering [for non-participants, add: *as you understand the program*]?

Q14. Are there any missed opportunities for the program? If so, what?

a. What could BPA and the program team do to lessen the weaknesses you identified?

b. [if interviewee brings up program management and processes] What opportunities exist to more effectively manage the offering and streamline program processes?

Experience with SEM (Participants Only¹⁰)

Q15. How has your experience as a utility been with the SEM offering and processes? Do you have any particular feedback about...

a. Interactions with BPA about SEM?

b. Incentives?

¹⁰ Include non-participating utilities that self-identified as being past participants

- c. Marketing materials?
- d. The process participants are guided through while they are in one of the cohorts?
- e. The Energy Smart Industrial Partners?
- f. The Technical Service Providers?
- g. Coordination between SEM and the capital improvement offerings?
- h. General program management for SEM?

Q16. Do you get involved in or provide support for end-users' use of performance tracking systems for their SEM-related efforts?

- a. [If yes, probe: How? In what ways has that been helpful to you and/or end-users? Not helpful?]

Q17. Next, I would like to ask about your savings reporting to BPA through the custom project calculator. In what cases do you report savings results, or do you always report them?

- a. [If always] So, just to confirm, you send in savings results even if there are no incentives at play or if the savings are negative?
- b. [If not always] What would BPA need to do to get you to report all savings results?

Q18. What role, if any, does SEM play in your customer relationships with those who participate? With non-participants?

- a. How, if at all, does SEM participation affect your relationship with any of these customers?
- b. Does it change how you engage with them?

Feedback from End-Use Customers (Participants Only¹¹)

Q19. How often do you talk with or hear from customers who are participating in SEM?

- a. What do you hear from them about the program while they are in it?
- b. After they complete it?

¹¹ Include non-participating utilities that self-identified as being past participants

Q20. What do you think is important for us to ask customers when we interview a few of them to really understand what is working, what is not working, and how to improve the program?

Q21. What do you think is the main appeal when customers first choose to participate?

- a. How do they first hear about the offering?
- b. What marketing methods seem to work best to attract interest?

Q22. What is the main value customers see in it when they look back after they have completed the program?

- a. What value, if any, do customers find specifically from the energy management plan feature of SEM?

Opportunity in the Commercial Sector

Q23. What kind of opportunity do you see for something similar to SEM for commercial sector customers in your service territory?

- a. How interested would [utility be] in that? Why do you say that?
- b. [If Interested] Would [utility] have the willingness and resources to take on or fund the SEM support for commercial customers, like recruitment, model development, coaching, cohort workshops, and other technical/operational support? *[If needed: This could involve in-house [utility] staff providing this support, or contracting with a third-party program implementer for those services]*
- c. What would the potential appeal be among commercial customers?
- d. What do you think it would take to get their attention?

Opportunities for Expansion in the Industrial Sector

Q24. Returning to industrial customers for a moment, what would it take to get greater uptake on the industrial side of the SEM offering?

- a. How can BPA motivate more large industries to return to SEM?

Wrap-Up

Q25. Those are all the questions I have prepared. Is there anything we haven't discussed that I should know about your experience with SEM as we think about ways for BPA to improve the offering?

APPENDIX C: BPA SEM PROGRAM DELIVERY STAFF IN-DEPTH INTERVIEW GUIDE

Note: This interview guide was written for conversations with program staff who implement BPA’s SEM offering and with regional stakeholders who are involved in SEM program offerings as well. We refer to SEM as a program in this appendix in order to maintain the original wording of the guide. The term “program” in this guide has the same meaning as the term “offering” in the body of this report.

* * * * *

To: Carrie Nelson, BPA
From: Joe Van Clock, Apex Analytics
Subject: BPA SEM Program Delivery Staff In-depth Interview Guide
Date: August 27, 2021

This memo presents an interview guide for key BPA and contractor staff involved in delivering the SEM program. These interviews will help the Evergreen team gain an understanding of the program’s context and key relationships between program delivery staff. **Table 1** provides details about this data collection effort.

Table 1: Data Collection Activity Details

Item	Response
Data Collection Activity Type	In-depth interview
Data Collection Mode	Zoom/Phone
Target Population	Program Delivery Staff
Sample Target	11 (including Bonneville program support, TSPs, and program implementers/ESIPs)
Sampling Approach	Census
Estimated Length	1 hour

Table 2 lists this project’s research objectives and identifies the program delivery staff interview questions related to each.

Table 2: Research Objectives Mapped to Interview Questions

Research Questions	Related Interview Questions
What motivates end-use industrial customers to engage with the program?	Q16
What elements of the program provide the greatest value to customers?	Q17
What motivates utilities to engage with the program? How could existing utilities become more engaged?	Q7, Q8
How do SEM programs affect broader utility industrial program offerings?	Q12
How has SEM engagement contributed to utility-customer relationship building?	Q13
What opportunities exist to more effectively manage the program and streamline program processes?	Q5
How effective are the relationships between program implementers and other key program actors, including utilities and end-use customers?	Q3
How effectively does BPA coordinate with NW SEM Collaborative and other SEM program administrators in the NW?	Q19, Q20, Q21
Which marketing methods are most effective?	Q4.b
Why don't more utilities participate with the program?	Q7.a

Introduction

Thank you for taking the time to speak with me today. Our process evaluation of the SEM program will look for opportunities to operate the program more efficiently and more effectively. Your experience with the program can contribute to that in a few different ways. We want to make sure we understand the program, and we also want to hear about your experience working on the program, the lessons you've learned, and the opportunities you see for improvement. Do you have any questions before we begin?

I'll be taking notes as we talk. Would it be OK if I also record our conversation? The recording is just to help with my notetaking. We won't share it with anyone, and we won't report anything in a way that would identify individual respondents.

Background/Roles

Q1. For my background, please tell me a little bit about your role related to BPA's SEM program.

- a. How long have you been in that role?
- b. Were you involved in the program before you came into your current role? If so, how?

Q2. Who do you regularly interact with as part of your work on the SEM program?

- a. What are their roles?
- b. [If needed:] Are there any areas of overlap between their role and yours? [If so:] How do you manage that?
- c. Are there any gaps in program coordination – anything that needs to happen that isn't officially part of someone's role? [If so:] How does that get done?

Q3. Overall, how effectively would you say you are able to collaborate with the other people involved in delivering the SEM program?

- a. What aspects of your collaboration work particularly well from your perspective?
- b. What aspects of your collaboration are most challenging?

Program Operations

Q4. Now, so I can get a better understanding of the program, please walk me through the process of participating in the SEM program for an industrial facility, starting with the time they first learn about the program:

- a. How do industrial customers learn about the program?
- b. [If not addressed:] What type of marketing does BPA, the program, or the utilities use to increase awareness? How effective are those marketing efforts?
- c. What, if anything, do they do before joining a cohort?
- d. How does the cohort process work? Who leads the cohorts?
- e. How, if at all, do they remain engaged with the program after the cohort process is done?

Q5. What parts of the process, if any, seem to be particularly challenging for participants, or their utilities? Why is that?

- a. What, if anything, would make those processes easier?
- b. What has prevented the program from making those changes?

Interaction with BPA Utilities

Note: Interviewer will adapt these questions according to the respondent's level of interaction with BPA utilities. For respondents with less interaction, interviewers will prioritize Q7, Q9, and Q12.

Q6. [If not addressed:] How, if at all, do you interact with the utilities offering the BPA SEM program?

Q7. What do you see as the most important factors that lead utilities to offer the program? Why do you think that is?

- a. Why do you think more utilities don't participate in the program?

Q8. We have heard that some utilities are more engaged with the program than others. Is that consistent with your experience?

- a. [If so:] Why do you think that is? What leads some utilities to be more engaged?

- b. [If not addressed:] Are there any patterns in which types of utilities are more engaged or less engaged? [If needed:] For example, do more engaged utilities tend to be larger or smaller? Do they tend to have a different distribution of customer types? Anything else?
- c. Are there any particular utilities that you think have developed particularly effective approaches to promoting SEM and working with the SEM program? What are they doing?

Q9. What aspects of the program are most valuable to utilities? Why do you say that?

Q10. What are their main frustrations with the program? Why do you say that? [If needed, probe on cohorts, ESIPs, TSPs, communications and marketing materials]

Q11. [If not addressed:] What value do utilities find in **performance tracking systems**?

- a. I understand some utilities see more value in performance tracking systems than others. Why do you think that is?
- b. [If not addressed:] How satisfied are utilities with the program's **incentives**? What, if anything, would they like to change related to the incentives or the incentive process?

Q12. How does SEM fit within a utility's broader industrial energy efficiency program offerings?

- a. Does that vary from utility-to-utility? If so, how?
- b. What industrial program offerings, if any, is it most important to coordinate with SEM?

Q13. How, if at all, have you seen SEM programs impact utilities' relationships with their industrial customers?

Q14. I understand that BPA is planning to begin offering a commercial SEM measure. How do you think utilities will respond to that? Why do you say that?

- a. What lessons, if any, have you learned from the industrial SEM program that could apply to commercial SEM?

Interaction with Industrial Customers

As with questions about utility interactions, interviewers will adapt questions to reflect respondents' level of interaction with industrial end-use customers. We will prioritize Q17 for respondents with less interaction.

Q15. [If not addressed:] How, if at all, do you interact with industrial end-use customers participating in the program?

Q16. What do you see as the most important factors that lead industrial end-users to participate in the program? Why do you say that?

- a. What would need to be different to attract more participants?
- b. Are there opportunities for the program to work with past participants, either to continue their engagement with the program or bring in other participants?

Q17. What elements of the program do you see as providing the greatest value to industrial end-use customers?

- a. What other elements of the program, if any, are particularly appealing to industrial end-use customers?
- b. What opportunities do you see to provide more widespread value to all participants?
- c. [If not addressed:] What value do industrial end-users find in their **energy management plans**?
- d. [If not addressed:] What value do industrial end-users find in **performance tracking systems**? How satisfied have they been with those systems? How have those systems helped them achieve SEM savings?

Q18. Overall, how satisfied do you think industrial end-use customers are with their experience in the SEM program? Why do you say that?

- a. What might lead some customers to be more satisfied than others?

Regional Coordination

Q19. How, if at all, do you work with other SEM program administrators in the Northwest?

- a. [If not addressed:] How, if at all, are you involved with the SEM Collaborative?

Q20. What are the greatest benefits of coordination with other SEM program administrators in the Northwest?

Q21. What are the greatest challenges in coordinating with other SEM program administrators?

Closing

I'd like to close with some broad questions about the program overall:

Q22. What do you see as the most effective aspects of the program? Why do you say that?

Q23. What do you see as the program's greatest challenges?

Q24. Those are all the questions I have prepared. Is there anything we haven't discussed that you think it is important for me to know as we move ahead with our research?

Thank you very much for your time and information. If we have any follow-up questions, would you mind if we contact you?

APPENDIX D: SEM PROCESS EVALUATION INDUSTRIAL END-USER INTERVIEW GUIDE

Note: We refer to SEM as a program in this appendix in order to maintain the original wording of the guide. The term “program” in this guide has the same meaning as the term “offering” in the body of this report.

MEMORANDUM

Date: April 5, 2022

To: Hanna Lee, BPA

From: Joe Van Clock, Apex Analytics (Evergreen team)

Re: SEM Process Evaluation Industrial End-User Interview Guide

This memo presents a draft interview guide for industrial end-use customers participating in BPA’s SEM program. As summarized in Table 1 the Evergreen team will seek to interview a variety of participants at various stages of their SEM engagement.

Table 1: End-User Interview Populations

Element	Value	
Data Collection Approach	In-depth interview	
Duration	45 minutes	
Target Respondents	New participants: End-use industrial customers completing initial cohort engagement (1 st two years of participation). Ongoing participants: End-use industrial customers still engaged with the program who have completed their initial cohort engagement. Past participants: End-use industrial customers no longer actively engaged with the program.	
Sample Target	New participants	12
	Ongoing participants	12
	Past participants	8
Sampling Approach	We will attempt a census of new participants and ongoing participants Past participants were selected for the sample frame using a stratified random sampling approach, with equal representation East of the Cascades and West of the Cascades.	

Table 2 lists the research objectives these interviews will address and the specific interview questions that will inform each objective.

Table 2: Research Objectives and Associated Questions

Research Objectives	Research Questions	Associated Interview Questions
How are end-use customers engaging with SEM and adopting SEM practices within their organizations?	What growth and advancement opportunities exist for energy champions and energy team staff?	Q14
	How persistent are behavioral changes resulting from SEM engagement?	Q8, Q17
What is the value proposition for end-use industrial customers to participate in SEM?	What motivates customers to engage with the program?	Q5.a, Q6, Q12
	What elements of the program provide the greatest value to customers?	Q7
	What value do customers find in their energy management plans?	Q6
	What value do customers find in performance tracking systems? What role have those systems played in achieving SEM savings and end-user satisfaction?	Q10, Q11
	What local and national recognition have participants received for their efforts? How has the company benefitted from that recognition?	Q13
What are the results of SEM engagement for utilities and customers?	How satisfied are utilities and customers with the program?	Q20
What opportunities exist to increase the effectiveness of program delivery?	What opportunities exist to more effectively manage the program and streamline program processes?	Q18, Q19
	How effective are the relationships between program implementers and other key program actors, including utilities and end-use customers?	Q19.b
What opportunities exist to expand the program?	Which marketing methods are most effective?	Q4
	To what extent are utilities and customers aware of key program elements? What are the most common sources of awareness?	Q4.a, Q4.b
	How can BPA motivate larger industries to return to SEM?	Q3 & comparative analysis of responses

Interview Guide

Introduction

Thank you for taking the time to speak with me today. As we mentioned when reaching out to you to schedule this conversation, we are working with BPA on some research that will help them improve the Strategic Energy Management component of the Energy Smart Industrial program, which I am going to call SEM. We are speaking with customers like you that have participated in the program to learn about your experience, how SEM has impacted your facility, and any opportunities to improve the program based on your experience. Do you have any questions about our research before we begin?

Finally, I will be taking notes during our conversation. Would you mind if I also record it, just to help with my notetaking? I won't share the recording with anyone, and won't report anything in a way that would identify individual respondents.

Background

Q1. What is your role within your organization?

- a. What is your role with regard to your organization's participation in SEM?

Q2. When did your organization begin participating in the SEM offering?

- a. Have you been involved with the program since your organization began participating? [*If not:*] When did you first become involved in SEM?
- b. [*If not involved since beginning:*] How easy or difficult was it to step into your role related to your organization's SEM efforts? What helped facilitate the transition? What was most challenging?

Q3. How is your organization currently engaged with the SEM offering?

- a. [*If not addressed:*] Do you still regularly attend workshops? How, if at all, do you interact with other members of your cohort? [*If not familiar with workshops, probe on how respondent has engaged with SEM*]
- b. [*If not addressed:*] Are you regularly in touch with SEM coaches or other staff involved in the SEM offering? [*If so:*] Which staff are you in touch with? What type of support do they provide?

Motivation and Awareness

Q4. How did your organization learn about the opportunity to participate in SEM?

- a. Were you aware of SEM before you were invited to participate in the offering?

b. *[If so:]* How did you learn about it?

Q5. What was your organization's reaction when you first learned about the SEM offering?

a. What was appealing about the SEM offering?

b. What questions or concerns did you have?

Q6. *[If not addressed:]* What, ultimately, led to your decision to participate in the SEM offering?

Value Proposition

Q7. What parts of your participation in the SEM offering have been most valuable? *[If needed, probe on: experience in cohorts, energy management plan, opportunity scan/treasure hunt, energy management software]* Why do you say that?

Q8. *[If not addressed:]* Did you go through your SEM engagement as part of a cohort?

a. *[If yes:]* What did you find most valuable about the experience of working with your cohort?

b. *[If yes:]* What, if anything, was challenging about working with your cohort?

Q9. I understand that the SEM program guides customers through the process of developing an energy management plan, which identifies and prioritizes energy savings opportunities and the actions needed to address them. Are you familiar with your organization's energy management plan?

a. *[If familiar:]* Were you involved in creating your organization's plan? *[If so:]* What was your experience with the process of creating the plan? Was it beneficial? What could be improved?

b. *[If familiar:]* How, if at all, do you use the plan?

c. *[If use plan:]* What elements of the plan are most helpful for you?

d. *[If use plan:]* What parts of the plan, if any, are not useful, or do not seem relevant?

e. *[If do not use plan:]* Why don't you use the plan in an ongoing way?

Q10. Does your organization use a software package and/or an Excel file to track energy performance over time? For example, tools might normalize consumption in terms of kWh per unit of production or use a regression energy consumption model? For the

following questions, we'll call this an energy performance tracking system. *[If needed:]* An energy performance tracking system is a software package that tracks key variables used to develop a meaningful energy use profile. It may include energy metering hardware installations to help overcome data barriers.

- a. *[If so:]* was it created in-house, purchased, or developed by the SEM program staff?
- a. *[If not:]* Have you considered systems like that? *[If considered:]* Why did you decide not to install one?
- b. *[If use system:]* How do you use your energy performance tracking system? *[If use more than one system (e.g. program-provided and a purchased or in-house system), probe on how they use each system and which they prefer and why.]*
- c. *[If use system:]* What have been the most important benefits of the performance tracking system for your organization? *[If needed:]* What role, if any, have those benefits played in the success of your organization's energy management efforts?
- d. *[If use system:]* From your perspective, what are the biggest limitations of your energy performance tracking system? *[If needed:]* What does it not do that you wish it could? *[If needed:]* To what extent do those limitations prevent you from achieving greater energy management outcomes?

Q11. *[If use system and not addressed:]* Has your performance tracking system helped your organization save energy as part of your SEM engagement? *[If so]* How?

Q12. What have been the most important ways, if any, your organization has benefited from your SEM engagement?

- a. *[If not addressed:]* How, if at all, does your participation in SEM support any broader sustainability goals that your organization might have?

Q13. Has your organization received any awards or other recognition for your energy management efforts?

- a. *[If so:]* What recognition have you received?
- b. *[If so:]* How, if at all, did you, or your organization, benefit from that recognition? *[If needed, probe:]* Have you publicized the recognition you received? Why or why not?

- c. *[If not:]* Do you think it would be beneficial to your organization to receive recognition for its energy management efforts? Why or why not?

Q14. What about internal recognition: to what extent does your organization value the contributions of energy champions and energy team staff? Why do you say that?

- a. *[If not addressed:]* To what extent are those staff able to take time from any other responsibilities they may have to participate in the energy team?
- b. What energy management activities, if any, could your organization carry out if staff had more time to devote to the efforts that you cannot currently complete?
- c. What growth and advancement opportunities are available staff focused on energy management?

Energy Savings

Q15. How has the amount of energy savings you have achieved through your participation in SEM compared with your expectations? Why do you think that is?

- a. How much additional SEM energy saving opportunity do you see in your facility?
- b. What are the most important ways the SEM program can help you capture those savings?

Q16. What are some of the most important changes you have made in your facilities to save energy as a result of your SEM engagement?

- a. *[If not addressed:]* Has your participation in SEM motivated your organization to make any capital improvements to save energy? *[If so:]* What improvements have you made?
- b. *[If not addressed:]* What operational or behavioral changes have you made?

Q17. Did you try making any changes, particularly operational or behavioral changes, that have not persisted in your organization?

- a. Which ones?
- b. How long did you maintain those changes before shifting away from them?
- c. Why do you think those changes did not persist?

Program Processes & Satisfaction

- Q18. What have been the most challenging aspects of your engagement with the SEM offering?
- a. How, if at all, did you overcome those challenges?
 - b. What support, if any, could the SEM offering provide that would help you overcome those challenges?
- Q19. What opportunities do you see for the SEM offering to work more efficiently or effectively?
- a. [*If not addressed:*] What parts of the participation process were complicated or difficult?
 - b. [*If not addressed:*] How, if at all, could the offering improve its communication to make sure you always have the information you need?
 - c. What do you think would be the best ways for the offering to encourage more organizations to participate?
- Q20. Overall, how satisfied are you with your experience participating in the SEM offering?
- Q21. Those are all the questions I have prepared. Is there anything we haven't discussed that I should know about your experience with SEM as we think about ways for BPA to improve the offering?