Engaging Small Manufacturing Plants in Strategic Energy Management: Early Lessons Learned from the ENERGY STAR for Industry Partnership and Southside Plant Performance Project

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ABSTRACT

Engaging small and medium sized industrial plants in efficiency programs focused on developing plant level Energy Management Systems (EMS) can be challenging. To address this issue, the US EPA's ENERGY STAR Industrial program (ENERGY STAR) examined different strategies used by successful corporate energy management programs to build effective plant-level energy management programs within their companies. Through this process, ENERGY STAR identified an approach that satisfies the desire to find quick energy savings in plants while furthering the corporate objective of building stronger plant energy teams, and establishing management mechanisms that support implementation and continuous improvement. After testing this approach with industrial plants participating in the ENERGY STAR for Industry program, EPA adapted the approach into a strategic energy management (SEM) type training program. This SEM training program was then tested through a utility energy efficiency program and group of small manufacturing facilities in Virginia to test several SEM program design questions, such as recruitment, integration into an existing program offering, and impact.

This paper provides an overview of the ENERGY STAR for Industry program involvement in SEM and discusses the strategies identified in successful corporate programs, how these approaches were adopted for the utility SEM training pilot, the results of the project, and key lessons learned from the process. The paper concludes that the initial results of the project were promising and that additional testing should be undertaken develop the model and further address SEM and utility program design questions.

Introduction

Over the past five years, interest in Energy Management Systems (EMS) and their role in promoting greater industrial energy efficiency has grown significantly. While guidance, tools, standards for structured EMS have existed for over a decade[1], terms such as *energy management systems*, *strategic energy management, continuous energy improvement, and ISO 50001* are still relatively new concepts to those outside of the industrial energy efficiency community. Consequently, many people involved in manufacturing are unfamiliar or unsure of the value these approaches can deliver.

Although awareness of the value of EMS approaches and SEM will grow over time if more plants and companies experience success, a more immediate barrier to participation in SEM programs can be found in the reluctance of many plant-level managers to participate in "programmatic" type work or efforts that do not appear to immediately impact the bottom line. Unlike a lighting upgrade that can generally guarantee that a specific level of savings will be achieved, the payback of an EMS is much more variable and harder to predict.

[1] For example, the ENERGY STAR Guidelines for Energy Management were released in 2003. The British Standards Institute published an early EMS standard in the late 1990's and the American National Standards Institute (ANSI) adopted the Management Standard for Energy (MSE 2000) in 2000.

The challenge of engaging small and medium sized plants in energy management programs is not a new issue (Shipley, Elliot, and Hinge 2002, Wilson and Macklin 2013). Even companies with strong corporate energy management programs face hurdles engaging plants in energy management activities within their own companies. However, there are companies that have been very effective in working with plants and establishing strong plant-level energy management programs. ENERGY STAR was interested in identifying strategies used by corporate energy management programs that could be transferred and adapted to create a basic SEM program design for utility and energy efficiency program sponsors.[2] By observing successful corporate programs involved in the ENERGY STAR program, EPA determined that the combination of providing instruction on EMS tools and a method for finding quick energy savings could provide an effective delivery mechanism for imbedding SEM practices at smaller companies or plants. The objective of the Southside Plant Performance Project was to test the application of concept.

ENERGY STAR and Strategic Energy Management

The ENERGY STAR Commercial & Industrial program involvement in corporate SEM began the mid-1990s when EPA decided to move away from a technology-based energy efficiency program model. In the early 1990's, EPA created a national market transformation program called Green Lights to promote lighting upgrades in the commercial, industrial, and institutional sectors. During the administration of the Green Lights program, EPA observed that organizations with a more structured and programmatic approach to facility, environmental, and energy management were more likely to implement the recommended Green Lights upgrades. At the same, EPA noted that most organizations lacked formalized energy management programs and that the absence of more formal programs could become a barrier to further investment in energy efficiency equipment and upgrades. Additionally, by promoting a single technology, such as more efficient lighting, EPA was concerned that other building efficiency opportunities would be overlooked unless the organization had broader energy efficiency goals and a commitment to continuously improve energy performance. The Green Lights program enjoyed high level of participation and success, however EPA determined that a more systematic and programmatic approach was needed. (Dutrow 2015) In 1995 EPA expanded the scope of the ENERGY STAR program to focus on whole-building performance and support corporate energy management programs. A few years later the Green Lights program was phased out and the ENERGY STAR program moved beyond lighting to whole facility performance in the commercial and industrial sectors.

A key objective of the ENERGY STAR Commercial & Industrial program is to support the development of strong corporate energy management programs through the development of guidance, tools, and other resources that promote SEM. To help companies implement their energy programs, EPA developed the *ENERGY STAR Guidelines for Energy Management,* which provided guidance on creating an energy management system. (Tunnessen 2004) Subsequent energy management tools were developed, including tools to assess the energy management practices of plants and support energy team and program development. To reward and showcase companies with outstanding energy management programs, EPA established the

[2] The Consortium for Energy Efficiency, through its Strategic Energy Management Minimum Elements (CEE 2014), outlines key outcomes for efficiency programs seeking to promote SEM to customers.

ENERGY STAR Partner of the Year for Excellence in Energy Management award program in 2003.[3]

Engaging plants in corporate energy management programs

The establishment of a corporate energy program with executive support at headquarters does not necessarily ensure that all plants and facilities within a company will fall in line with the company's commitment to energy management or achieving energy-related goals. For many corporate energy managers, gaining executive support for the energy program is the first hurdle that is followed by the on-going work of engaging plants and building plant-level energy teams. The level of initial involvement and participation by plants in the corporate energy programs is usually influenced by the organizational structure, culture, and the level of accountability for achieving energy goals at the plant. In companies with limited or no corporate energy management experience, energy program directors frequently face similar challenges as do utility and energy efficiency program sponsors (program sponsors) when engaging plants in energy program and SEM related activities. These challenges include:

- Unsupportive plant managers who are unsure of the value of establishing a plant energy team or instituting more formalized energy management practices;
- Concerns that energy "program" related work can distract from the manufacturing functions of plant staff;
- Lack of a plant-level energy manager, champion, or team;
- Limited plant engineering capacity for energy management due to staff time constraints;
- Limited plant staff experience with energy projects and energy management;
- Budget constraints;
- Concerns about energy goal requirements and reporting;
- Less interest in "programmatic" work than "project" related work;
- Skepticism about "corporate" and "headquarters" initiatives; and
- Push-back from facilities, operations, and other staff who are concerned that corporate programs are mainly looking to identify problems and reduce overhead at the plants.

To help corporate energy managers overcome these types barriers, ENERGY STAR has worked with industrial partners to identify and develop tools and tactics for helping plants establish energy programs and SEM practices. These tools include:

- Facility Energy Management Assessment Matrix: A gap analysis tool used to evaluate plant-level energy management practices through a comparison to the elements of the ENERGY STAR Guidelines for Energy Management.
- Teaming Up to Save Energy: A guide book on forming energy teams.
- Plant poster series: A set of customizable employee awareness posters that leverage the ENERGY STAR brand.
- ENERGY STAR Challenge for Industry: A recognition program for plants that reduce their energy intensity by 10% or more within five years or less; an energy management tool to help sites set goals and track performance over time.
- Energy Tracking Tool: A preprogrammed spread-sheet for energy tracking, setting goals, calculating greenhouse gas emissions, and generate reports.

[3]A list of past companies receiving the ENERGY STAR Partner of the Year award for Excellence in Energy Management can be found at www.energystar.gov/about/awards/awards-archive.

- Small & Medium Sized Manufacturer Energy Guide: A guidebook describing common energy efficiency measures and opportunities.

These and other tools have been widely used and adapted by ENERGY STAR corporate partners to develop effective plant energy programs.[4] However, in the late 2000's one approach and best practice began to emerge as being highly effective for working with plants: the Energy Treasure Hunt.

The Energy Treasure Hunt was developed by the Toyota corporate energy program[5] to identify energy savings at plants while engaging and training plant personnel. Derived from the *Kaizen* and other Toyota quality management techniques, the Energy Treasure Hunt focus on using plant staff to identify, quantify, prioritize, and implement low and no cost energy savings opportunities. Using the Energy Treasure Hunt approach, the Toyota corporate energy program was able to quickly identify energy savings opportunities while training and building capacity for plant energy teams to implement the energy projects identified during the Energy Treasure Hunt. The Energy Treasure Hunt process was also used to build and reinforce energy management practices and program requirements for a broader corporate energy management program (Bremer 2005).

The effectiveness of the Energy Treasure Hunts made it the foundation for the Toyota energy program and one of the key strategies used by the program to continuously improve the performance of their plants.[6] The success of the Toyota energy program generated interested among other industrial companies participating in the ENERGY STAR program. Because of the focus on identifying low and cost non-capital energy saving opportunities, many ENERGY STAR partner companies became interested in the Energy Treasure Hunt process during the economic recession during the late 2000's when capital for larger energy projects became very difficult to obtain. During this time, the Toyota energy program openly shared and trained numerous energy managers from other ENERGY STAR partner companies on conducting Energy Treasure Hunts. Additionally, Toyota expanded its Energy Treasure Hunt program to engage supplier companies in better energy management practices (Toyota 2013).

The Energy Treasure Hunt process spread across many companies participating in the ENERGY STAR partnership who adapted it to their own organizational cultures and energy program requirements. Companies who had learned the process from Toyota went on to mentor other companies on the approach. To encourage the further use of Energy Treasure Hunts, EPA developed a guidance document and training module which it tested with several energy partners.[7] Additionally, EPA tested combining coaching on Energy Treasure Hunts and ENERGY STAR SEM resources with several smaller companies that had joined the program and sought assistance with developing energy programs. Based on outcomes of working with these companies, EPA determined that the combination of instruction on ENERGY STAR EMS tools with the Energy Treasure Hunt process as delivery mechanism for imbedding SEM practices at plants appeared to an effective method establishing SEM methods at smaller companies or plants.

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[4] These and other tools can be accessed at www.energystar.gov/industry

[5] The official name of the program is the Toyota Motor Engineering and Manufacturing, North America Energy Management Organization or TEMA EMO.

[6] Toyota applications for the ENERGY STAR Partner of the Year Awards for Excellence in Energy Management since 2004 have discussed how Energy Treasure Hunts have formed the basis of their program and contribute to large portion of their energy savings.

[7] The final version of this guidance document can be found at energystar.gov/treasurehunt.

One of the reasons why Energy Treasure Hunts have been effective in engaging plants is that they have a track record in identifying quick, non-capital energy savings opportunities. ENERGY STAR has many examples of energy and cost savings discovered through Energy Treasure Hunts. Since most plants are more interested in cost savings than energy management, the offer of an Energy Treasure Hunt that will find some "free" cost savings gives the energy program a foot in door. Once a plant agrees to conduct an Energy Treasure Hunt, the energy program can begin the process of building a site energy team and introducing the energy management practices that will be necessary to measure, manage, and implement the energy saving actions identified. Because Energy Treasure Hunts involve, train, and reward plant staff for identifying energy savings opportunities, they are perceived by plant staff as less threatening than energy audits or assessments that undertake many of the same activities. As a result, the implementation rate for projects and savings measures identified by Energy Treasure Hunts tends to be high. Many third-party audit reports that may identify similar opportunities end up on shelves because the auditors did not effectively engage the plant employees who must make the changes. Energy Treasure Hunts also focus on quantifying operational and behavioral energy saving opportunities which typically require an energy program to implement. This process of quantifying the costs of inefficient operations and behaviors helps to further underscore the need for a plant energy program and EMS.

Packaging an SEM approach

As a national program, it is easier for ENERGY STAR to work with corporate energy programs than individual plants. While ENERGY STAR has developed many tools that are applied at the plant level, EPA has focused its distribution of these tools and resources through corporate energy programs that offer a single point of entry into larger networks of plants. This approach has been effective, particularly within large well-known publically traded companies and companies in manufacturing sectors where an ENERGY STAR Industrial Sector Focus has been convened.[8] The challenge for the ENERGY STAR industrial program is reaching smaller manufacturing companies that are outside of the current or planned Industrial Sector Focus schedule or that are regionally based. These types of manufacturing operations typically have less involvement in national-level programs and are more difficult for federal programs to identify and engage. Utility and regional energy efficiency programs have more contact and involvement with these types of companies or plants since their outreach efforts are defined by geographical service areas.

EPA has long recognized the role utility programs play in reaching local audiences. A key strategy employed by the ENERGY STAR products and residential programs is to partner with utility programs that promote and provide incentives to local markets. In the industrial market, EPA attempted to encourage program sponsors to use ENERGY STAR SEM resources as early as 2004. However, at that time most programs sponsors were not considering SEM approaches and EPA did not offer ENERGY STAR SEM resources in formats that were compatible with their program's design. With utility programs now showing more interest in SEM approaches, the timing was right to explore more effective ways to encourage the use of existing ENERGY STAR SEM resources.

[8] ENERGY STAR Industrial Sector Focuses are multi-year initiatives that involve specific manufacturing sectors or sub-sectors. EPA has convened over 28 Industrial Sector Focuses since 2002. See Boyd & Tunnessen ACEEE 2013.

One the roles the ENERGY STAR program has played in other market segments is identifying areas where a common set of materials or standards can be used by multiple entities. ENERGY STAR product certification, for example, helps prevent the duplication of effort in creating product standards for energy-efficient products. Instead of every efficiency program sponsor developing their own efficiency ratings and labels, ENERGY STAR provides a national standard and brand that all programs can leverage. This approach allows the utility and regional programs to focus on implementation rather than incurring large costs in developing product specifications and creating local brands.

With the growth in industrial SEM programs at the utility and regional level, there has been some "reinventing of the wheel" in the development of SEM tools and resources. While SEM program models are not analogous to consumer product resource acquisition programs, EPA believed it should explore if ENERGY STAR could play a role in helping to reduce the programmatic costs of developing an SEM program by offering a basic or foundational "package" that other efficiency programs could use or build on. The benefits of this approach would be to allow SEM program sponsors to dedicate more resources towards their program's outreach and implementation efforts, which are critical components for the program's success.

EPA was also interested in developing an economical entry point for SEM adoption. Although the ISO 50001 creates a common standard for energy management systems, full adoption and certification to the standard can be expensive. (See Therkelsen, et al 2013). Even if certification costs are rebated or subsidized by a program sponsor, the internal staff time required to develop documentation, formal procedures, and other elements necessary for certification are significant, especially if the company has not had prior experience with other management systems (e.g. ISO 14001). For small and medium-sized companies and plants, with limited personnel time to devote to an energy program in general, pursuing certification to ISO 50001 is likely to be viewed as a major undertaking and a non-starter. To reach more companies, an easier, low-cost approach to developing an EMS is necessary to enable more companies to gain experience with EMS.[9] Furthermore, for many companies an effective EMS can be established without certifying to the standard. For ENERGY STAR, what is important about establishing an EMS or adopting SEM approaches is the end result of improving energy performance which is not dependent on certification or conformance with a single method.

Lastly, ENERGY STAR wanted to develop an SEM "package program" that could be used by other non-utility programs, such as NIST Manufacturing Extension Partnership programs and local E3 initiatives[10] that may be interested in offering energy management oriented training. Additionally, many ENERGY STAR industrial partners were interested in a packaged SEM program that could be used with both plants and suppliers.

Southside Plant Performance

In 2012 EPA worked with several ENERGY STAR partner companies to identify a utility program interested testing a new SEM approach. Danville Utilities, a municipal utility located in the "Southside" of Virginia, agreed to work with the ENERGY STAR Industrial

[9] The ENERGY STAR program contributed to the development of the ISO 50001 through the author who was a member of the US Technical Advisory Committee (US TAG) for the ISO TC 242 which developed the ISO 50001 series of standards.

[10] E3 refers to the Environment, Energy, and Economics program coordinated by the US EPA that links federal programs to local community sustainable development initiatives. The E3 program frequently promotes ENERGY STAR resources to its network which also involves many regional MEP programs.

program to test a new SEM approach. Danville Utilities is a city-owned utility that provides gas, electric, water and other services to a wide number of small and medium-sized manufacturing plants located in the Danville area which has a long history as manufacturing center. The utility had experience implementing ENERGY STAR-oriented programs, including Home Performance with ENERGY STAR which focuses on residential weatherization and upgrades. For industrial customers, the utility offered a number of rebates and custom incentive programs but was primarily doing lighting upgrades at the time. Since the utility is not required to operate an industrial efficiency program by the State of Virginia, the efficiency program had greater flexibility to participate in a test project. The utility was interested in partnering with the ENERGY STAR program since it wanted to identify new ways to provide value to its customers as well as generate new projects for its custom rebate program.

The utility's role in executing the project was to recruit and manage relationships with customers, coordinate logistics, attend all training & coaching sessions, and participate in the Energy Treasure Hunts conducted by the customer participants to identify potential projects for incentives. The ENERGY STAR program's role was to assist with customer recruitment, provide the SEM tools and resources, and conduct all the trainings and coaching sessions. The project was designed to be implemented over a twelve month period, after which Danville Utilities would take over the program and replicate the process the following year. No financial assistance was provided by the EPA to Danville Utilities for partnering on the project.

The project was entitled Southside Plant Performance, which combined the regional name for southern Virginia with the "Plant Performance with ENERGY STAR" program design concept that EPA is interested in developing. The nomenclature of "Performance with ENERGY STAR" is used to denote program designs that are intended to be implemented by other program sponsors. Examples of this format include Home Performance with ENERGY STAR and Building Performance with ENERGY STAR in the commercial buildings market. Organizations implementing these programs are not required to use the "Performance with ENERGY STAR" in their program's title but must follow certain guidelines.

Southside Plant Performance was designed and operated using a "cohort" model, whereby all training sessions were conducted with the full group of participants. Because this was the initial test run of the program design, ENERGY STAR wanted to limit the number of participants to no more than five to six company representatives. Recruitment was conducted over a three month period and five companies registered to participate in the program. To participate in Southside Plant Performance, the management at the participating plants were required to sign a registration form agreeing to:

- Designate an energy champion;
- Authorize the energy champion to participate in all training and coaching sessions;
- Register the plant to take the ENERGY STAR Challenge for Industry;
- Conduct an Energy Treasure Hunt within designated time period;
- Take steps to establish and maintain an energy program; and
- Support the establishment of a local energy networking group.

In addition to these requirements, it was strongly recommended that the designated energy champion have an engineering, technical, or facilities management background or experience. The intent of the registration form was not to create a contract between the plant and Danville Utilities who was the official program sponsor. Rather, the objective was to ensure that the plant management was of aware and supportive of the program's expectations and objectives.

Facility size and energy management experience among the plants participating in Southside Plant Performance varied. Three of the five companies were small to medium sized manufacturing plants[11] with no existing energy programs and limited experience with energy projects. One was a large facility and part of an existing corporate energy management program, though not an ENERGY STAR partner. The other plant was a medium sized manufacturing plant that had recently established an energy program and become an ENERGY STAR partner.

The Southside Plant Performance training program consisted of two day long workshops followed by a series of regular "coaching sessions" conducted over the course of four months using a web conferencing platform. The workshops focused on introducing EMS and SEM concepts and training on conducting an Energy Treasure Hunt. Coaching sessions initially focused on providing more guidance on taking specific EMS related actions and ensuring milestones toward conducting the Energy Treasure Hunt were being met. All program participants were provided relevant ENERGY STAR tools and resources. During the course of the project, participants were given specific homework activities to complete, all of which supported implementing different elements of an EMS.

All of the five plant energy champions participated in the all of the training workshops and the majority of the coaching sessions. One participant was forced to drop out of the program due to a major flood at his plant. Three of the participating plants registered for the ENERGY STAR Challenge for Industry, which required the plant to register an annual baseline energy intensity with EPA and pledge to reduce energy intensity by ten percent within five years or less. The other plant proposed taking the ENERGY STAR Challenge for Industry to their corporate program but did not register during the twelve month test period of the project. Three of the four remaining plants conducted their Energy Treasure Hunts during the designated test period. Two plants conducted whole-plant Energy Treasure Hunts and one plant focused on a specific target area within the plant. The remaining plant conducted its Energy Treasure Hunt several months after the test period ended. Results of the Energy Treasure Hunts conducted during the test period are presented below.

	Plant 1	Plant 2	Plant 3
Plant Annual Energy Spend	$ 5 million	$ 950,000	$ 3 million
Annual savings identified	$200,000+	$62,000+	$80,000 in targeted area
Average payback on projects	3 months	6 months	8 months
Energy intensity reduction potential	6%	6%	3 %
Projects qualifying for rebates[12]	Lighting upgrade	Lighting upgrade	Lighting and HVAC upgrade
Plant energy action plan created?	Yes	Yes	Yes
Took ENERGY STAR Challenge for Industry?	Yes	Yes	Yes
Energy Program Results	Program strengthened	Program established	Program established

[11] For this project, a small manufacturer was defined as having an energy spend under $1 million, and a medium sized manufacturer had an energy spend under $ 5 million.

[12] Danville Utilities' Custom$ave program offered $175 per kW rebate to any project that reduced electrical load by at least 1 kW. Addition rebates were offered for lighting controls, exit signs, and HVAC components. Other projects were identified beyond lighting or HVAC upgrades, but did not necessary qualify for a utility rebate.

For the plants completing their Energy Treasure Hunts, the identification of quick energy saving opportunities demonstrated the value of establishing a formal energy program to both the plant and company management. The involvement of plant personnel in the Energy Treasure Hunts helped establish energy teams at the facilities as well as ensure that energy saving measures were implemented. In follow-up conversations with the plant participants, several companies stated that they expected the actual savings from implementing the measures identified during the treasure hunt to be higher than initial estimates. For Danville Utilities, the Energy Treasure Hunts proved to be an effective means to identify projects for their rebate program.

The final phase of the Southside Plant Performance project involved establishing a local networking group for energy managers in the Danville area. The rationale for the networking group was to allow the members of the cohort to continue to interact while at the same time creating a venue that could be used to recruit future Southside Plant Performance participants. The utility agreed to play a coordinating role along with one of the members of the cohort group. There was strong interest by program participants to continue to interact since the group got along well and valued the opportunity to share ideas and experience with other people involved in manufacturing in the Danville area. Since the local group was interested in having a formal affiliation with a national organization, ENERGY STAR recommended they form a local chapter of the Association of Energy Engineers (AEE) since ENERGY STAR does not formally sanction local groups. In late 2013, the Danville Chapter of AEE was established and several of the cohort members have gone on to become AEE Certified Energy Managers (CEMs). In 2014 members of the cohort group and AEE chapter conducted an Energy Treasure Hunt at the Danville Boys & Girls Club as part of the ENERGY STAR Change the World campaign.

One aspect of the project, unfortunately, did not go as planned. In the middle of the project, the utility's energy efficiency coordinator who was being trained to replicate and continue the Southside Plant Performance program left to work for a different utility energy program in a nearby state. The utility then filled the energy efficiency coordinator position with an internal hire who had no prior energy efficiency program experience. At first, it appeared that the Southside Plant Performance program might serve as an excellent training program for this new hire. However, this person left after a year in the position, leaving the utility with no remaining staff with experience with the Southside Plant Performance. While the City of Danville is interested in continuing the program, EPA has not had the opportunity to train the new utility energy efficiency coordinator on the Plant Performance process. Consequently, Danville Utilities has not been able to continue the initiative.

Overall, the ENERGY STAR program, Danville Utilities, and the program participants were very pleased with the results of the program. The process was able to quickly build support for energy management in the plants that participated and put those plants on a pathway towards establishing a formalized energy program. At the end of the 12 month test period, the two plants that had lacked any formalized energy program had put in place many of the key elements of an EMS. The parent company of one these plants has gone on to become an ENERGY STAR Partner and replicating the process at its other facility. The two plants with existing energy programs were able to strengthen their plant programs and build better internal support across all levels of their organizations. Additionally, the parent company of one of these plants has replicated the Plant Performance process at its other facilities.

Lessons Learned

Southside Plant Performance was conducted as a prototype project to test a variety of design elements and identify areas for further refinement through additional pilot testing. Through the project, ENERGY STAR was interested in examining a number of SEM program design questions, some of which are discussed below.

Could the program be integrated into an existing utility program offering?

EPA wanted to explore the feasibility of integrating an SEM approach into an existing utility program structure. In this project, the utility was able to successfully integrate the program into its existing program offering. For the utility, the SEM program offered a value-added service to customers while also helping to identify new projects for its custom rebate program.

Since SEM approaches are relatively new, ENERGY STAR see some advantages of being able to integrate an SEM program into an established program versus creating a new program design that would require approval from state utility regulators. In the Southside Plant Performance project, utility regulatory oversight and program approval was not an issue, which did enable Danville Utility to easily participate. Additionally, Danville utilities offered a custom rebate program which gave it greater flexibility to select projects. While the initial results suggest that the Plant Performance model could be integrated into existing program designs, further projects with more regulated utility programs are necessary to test this strategy.

Would companies commit to the program's participation requirements?

Danville Utilities and ENERGY STAR did not have difficulty generating interest in the program given the past track record of ENERGY STAR partner companies saving money through strong energy programs and Energy Treasure Hunts. But, as discussed earlier, program participants were required to make specific commitments in order to participate in Southside Plant Performance. EPA felt that these requirements would help ensure greater success but was also concerned they could be a barrier to participation. Fortunately, the program's participation requirements did not appear to be a significant barrier to participation since Danville Utilities was able to recruit the plants into the program and had several additional plants express interest in participating in the next round. The participants in the program stated that the registration form was helpful in securing support from plant management since it outlined the expectations of the program.

Could SEM training be effectively delivered in a group setting and through distance learning approaches?

ENERGY STAR was confident that the cohort approach would be successful given past experiences with ENERGY STAR Industrial Sector Focuses and the SEM cohort programs in the Pacific Northwest. Feedback from participants indicated that the group interaction was one of the most valuable aspects of the program. The continuation of the relationships formed among the cohort participants is further evidence of the value of group learning methods that foster networking. Based on the results of the project and feedback from participants, the use of web conferences, shared online document folders, and other distance learning tools provided a great deal of convenience. However, both EPA and the program participants felt it was extremely beneficial that the cohort participants had met and networked in person in the prior training workshops.

Would the plants take keys steps towards establishing energy programs?

As noted before, three of the five initial plants that registered for the program had no formal energy program. Two plants participating the program have gone on to form energy programs, while the other plant was forced to drop out due to a flood. The action items built into the Southside Plant Performance program were designed to help plants establish many of the fundamental elements of an energy management. However, the program did not audit participants to confirm specific EMS elements were established, so only anecdotal records can be used to judge the plant's energy program status. Some indicators the program participants have continued to focus on energy management include one plant's parent company becoming an ENERGY STAR partner, continued participation in the local AEE chapter, and CEM certification by several the program participants.

Could the plants be put on a pathway towards continuous improvement and maintain savings?

Ultimately the best indicator of the effectiveness of an SEM program is whether the program participants continue to improve their energy performance after completing the program. One of the requirements of the Southside Plant Performance was that the plant was required to sign up for the ENERGY STAR Challenge for Industry. To participate in the Challenge for Industry, a plant must register an annual intensity baseline with ENERGY STAR. If a plant's energy intensity is reduced by ten percent or more within five years or less, the company can apply for recognition from ENERGY STAR after completing a verification process. The rationale behind having participating plants take the Challenge for Industry was that it creates both a goal oriented objective for the program and a means for EPA to evaluate if any of the plants went to improve their performance. Since completing the project, EPA has heard from several of the plants, and they are making progress towards achieving the Challenge for Industry.[13]

Could existing EM&V methods be used?

Danville Utilities was able to use their existing EM&V methods for the projects that they selected for their rebate program. However, the utility did not attempt to measure and claim any additional savings that could be attributed to participating in the project. The Southside Plant Performance project focused more on testing the training methodology than testing how EM&V approaches could be applied to a "Plant Performance with ENERGY STAR" model. Potentially, under the program's design, there could be several different options for determining savings, either using more traditional project-based EM&V methods or approaches that seek to quantify the impact of the EMS and SEM training. In future tests of the Plant Performance with ENERGY STAR model, EPA intends to explore EM&V related issues in greater depth.

Would participants value the training and experience they received?

All the participants indicated they valued the training and quick results generated by the program. Program participants felt that the level of detail was good and the combination of training workshop and coaching sessions did not make participation too much of a time burden. Plant managers were also pleased by the project's focus on finding results and establishing responsibility for implementation.

[13] Plants participating in the Southside Plant Performance who registered for the Challenge for Industry would have used a baseline period ending in either 2012 or early 2013.

Summary

The integration of SEM training with guidance on conducting an Energy Treasure Hunt provided an effective format for engaging small and medium sized plants based on the results of the Southside Plant Performance project. The brand recognition of the ENERGY STAR program combined with examples of quick savings opportunities identified through prior Energy Treasure Hunts helped sell participation in the project to plant management and overcome some of the common barriers for participation in SEM programs. At same time, the program requirements and training methods helped companies without prior energy management experience establish energy programs. EPA was pleased with the initial results of the program and is now looking to conduct more formal pilot tests with interested utilities and energy efficiency program sponsors. Additionally, EPA plans to test the Plant Performance with ENERGY STAR training program as a platform building energy programs at supplier companies to ENERGY STAR partner companies.

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