Plant-level Goal and Recognition Programs as a Strategic Energy Management Tool

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ABSTRACT

An important aspect of developing Strategic Energy Management (SEM) programs at industrial facilities and within companies is engaging management and employees to cultivate an organizational culture focused on energy efficiency. In theory, participation in plant-level goal setting and recognition programs offers energy managers multiple ways to engage both employees and executives to build support for SEM initiatives while driving action to achieve savings.

In 2010, the United States Environmental Protection Agency (EPA) launched the ENERGY STAR Challenge for Industry (Challenge) as a tool that energy managers could use to better engage their facility staff and management in SEM. As of December 2016, over 1,300 plants have taken the Challenge by pledging to reduce energy intensity by 10% within five years or less. The Challenge been achieved over 420 times, with an average reduction of 19.7% within two years resulting in over 73 trillion BTUs of energy (source) savings.

This paper reports on EPAs' evaluation of the impact of the ENERGY STAR Challenge in supporting SEM practices at the plant and corporate levels. The paper also discusses the role of recognition in behavior-based energy efficiency program design and explores the use of plant-level goal and recognition programs could be integrated into utility sponsored SEM programs.

Introduction

The term Strategic Energy Management (SEM) is used broadly to describe approaches to energy efficiency that promote business practices and organizational support for the continuous improvement of energy performance.[1] To promote energy savings, SEM programs generally provide guidance on gaining management support, building energy teams, formalizing energy management practices, establishing baselines, setting energy performance goals, finding operational and behavioral energy savings, measuring energy performance and quantifying energy savings.

Manufacturers generally participate in SEM programs because they realize that establishing better energy management practices yields greater energy and cost savings over time. Some SEM programs also offer financial incentives tied to energy savings or underwrite costs associated with conducting an energy management initiative at a manufacturing plant. (CEE 2016). While financial incentives and cost savings can be important selling points, they are not the only motivators for better energy management. Internally, SEM programs appeal to managers for the non-energy benefits they offer, including lower maintenance costs, preventative

[1] The Consortium of Energy Efficiency (CEE) in its SEM Minimum Elements defines SEM as "a holistic approach to managing energy use in order to continuously improve energy performance, by achieving persistent energy and cost savings over the long term. It focuses on business practice change from senior management through shop floor staff, affecting organizational culture to reduce energy waste and improve energy intensity." (CEE 2014)

and predictive maintenance tools, and increased inter-departmental communication, planning and cooperation (Lancaster and Towns 2015).

Recognition by outside organizations that attest or verify performance can also be an important driver for participation. Third party recognition programs, which can include certification[2] and eco-labelling initiatives, help validate a program's credibility (Banerjee and Solomon 2003). External recognition also affirms improvements to upper management and ensures transparency and objectivity of the claims being made by a company (McKane, et al. 2015).

Recognition[3] can play other important roles in promoting an organizational culture that values energy efficiency. Recognition can improve one's image and reputation and allow an entity to distinguish itself from its competitors (Olubunmi, Via and Skitmore 2016). External recognition through partnership programs, performance standards, or achievement awards sustains momentum and support for an energy program and produces positive exposure.

Several papers show how social norms can affect behavior (Cialdini, Kallgren and Reno 1991) and in particular how people's attitudes and behavior towards energy consumption is affected by social norms (Mazur-Stommen and Farley 2013), (Payne 2006), (Dixon, et al. 2015), (Steg and Vlek 2009). These authors discuss how efficient or inefficient behavior is influenced by a person's perception of how others manage energy (i.e. the extent to which a certain behavior is common) and whether others would approve or disapprove of how that entity uses energy (i.e. the extent to which a certain behavior is accepted).

This evidence shows that recognition programs provide a means for companies (and individuals) to demonstrate appropriate behavior to the stakeholders they value. Recognition programs are also a medium through which approval or disapproval is provided. In this context, they can help catalyze change (UK Department for Environment Food and Rural Affairs 2008) and shape the norms related to energy management and business operations.

Most recognition programs for industrial energy efficiency have highlighted specific energy savings projects. These include award programs offered by industrial trade associations such as the Portland Cement Association and American Chemistry Council[4] and awards sponsored by states, such as the Governor's for Energy Excellence award in Michigan and similar programs in Idaho, Utah, Virginia, and elsewhere.

Recognition programs focused on industrial energy management and energy efficiency have primarily operated at the national level.[5] These include the ENERGY STAR Partner of the Year Award, ENERGY STAR plant certification, and ENERGY STAR Challenge for Industry

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[2] Certification and labeling programs such as ENERGY STAR, LEED, FSC, and USDA Organic can be forms of positive recognition, however their main objective is generally to help distinguish a product or property from a competitor by communicating a specific benefit to a consumer. Award-based recognition programs generally focus on providing a reward for achieving a specific goal and are usually given to reinforce a specific behavior within an organization. In this regard, the benefit is primarily to the organization.

[3] Recognition can take a variety of forms, but for this paper, recognition is a formal award given by an outside organization to manufacturing company for achieving a defined level of energy performance and other criteria.

[4] See Portland Cement Association Energy and Environment awards at http://www.cement.org/about/energy-and-environment-awards and American Chemistry Council energy efficiency awards at: https://www.americanchemistry.com/Media/PressReleasesTranscripts/ACC-news-releases/ACC-Announces-2016-Responsible-Care-Energy-Efficiency-Award-Winners.html

[5] Additionally, there are a number other federal energy related recognition programs at the national level, such as the Green Power Partnership and Combined Heat and Power Partnership awards sponsored by EPA.

administered by EPA and the Superior Energy Performance (SEP) program and Better Plants program administered by the U.S. Department of Energy.

Historically, most utility sponsored industrial energy-efficiency programs have not offered award-based recognition programs to customers.[6] Within utility SEM programs, awards and recognition is still generally viewed as a less important program design element.[7] This is reflected in the 2014 and 2016 CEE SEM Program Summaries which do not feature recognition or award programs as a specific program element that is inventoried.[8] However, federal recognition programs are identified as an area where some utilities provide support for "other SEM pathways," which also includes certification to ISO 50001.

For the US EPA's ENERGY STAR program, award-based recognition[9] has been an important component of promoting the continuous improvement of energy performance. EPA has also observed that recognition programs support better energy management practices. Recognition could, therefore, help enhance utility SEM programs by helping to ensure that SEM program participants maintain their focus on energy management and continuous improvement after completing the SEM training.

To further examine this theory, an assessment of the ENERGY STAR Challenge for Industry was conducted to examine how this award-based recognition program has supported SEM practices in industrial facilities over time. This paper presents the findings of the assessment after providing some background on EPA's use of recognition to promote industrial energy efficiency. The paper concludes by discussing how utility programs could integrate recognition with existing programs, drawing on some of the lessons learned through implementation of the Challenge.

EPA experience using recognition to promote energy efficiency

The United States Environmental Protection Agency (EPA) has a long history of using recognition-based market transformation programs to promote energy efficiency starting with the GreenLights program in the 1990s. The GreenLights program demonstrated that recognition could be used to promote the wide-scale adoption of more efficient commercial lighting technology in lieu of financial incentives (Dutrow 2015). In the late 1990s, EPA phased out the GreenLights programs and introduced the ENERGY STAR Buildings program to focus on offering recognition for whole building energy performance. Leveraging the growing brand equity created by ENERGY STAR certified products, the ENERGY STAR Buildings program encourages organizations to improve the efficiency of their buildings by recognizing the most efficient facilities with the ENERGY STAR label. Additionally, the ENERGY STAR Buildings program created a recognition program to showcase organizations with outstanding energy management practices known as the ENERGY STAR Partner of the Year Award for Excellence in Energy Management. In 2002, EPA expanded the ENERGY STAR Building program to the industrial sector and began offering ENERGY STAR certification to top performing industrial

[6] The authors reviewed current industrial energy-efficiency program information and interviewed over 30 program administrators, implementation contractors, program participants, and others knowledgeable in utility sponsored energy efficiency programs to assess the use and perceptions of recognition programs.
[7] Ibid.
[8] The CEE 2016 Strategic Energy Management Program Summary is available at: https://library.cee1.org/content/cee-2016-industrial-strategic-energy-management-program-summary-0.
[9] Award-based recognition is given for meeting a specific set of predetermined criteria.

plants in 2006. In offering recognition to industrial plants, EPA's goal was to help inspire companies to incentivize a shift in the energy performance for an entire industry and to support the growth of stronger energy management practices.

ENERGY STAR industrial plant certification recognizes the plants within an industrial sector with the best energy performance. Making this determination required the development of sector energy benchmarking tools known as ENERGY STAR Energy Performance Indicators (EPI) or EPA approval of an existing industrial sector benchmark (Boyd 2013). Currently, 14 industrial plant types are eligible for ENERGY STAR certification, and within any sector, the top quartile of performance will qualify for recognition. This means that across all US industrial plants, ENERGY STAR certification will be obtainable by a finite number of facilities.

Since the opportunity to earn ENERGY STAR certification is reserved for top performing plants, manufacturers involved in the ENERGY STAR program asked EPA to offer other forms of recognition for plants that could not yet achieve top quartile energy performance or where no EPI was available. Energy managers from these companies saw the value that ENERGY STAR recognition could provide in helping to increase awareness of energy initiatives, motivate plants, and drive further savings. Furthermore, these companies had adopted the ENERGY STAR program's SEM framework known as the Guidelines for Energy Management.[10] The Guidelines encourage companies to pursue recognition for achievements. As a result, these companies were looking for opportunities to provide their plants with recognition from a creditable third-party organization.

The ENERGY STAR Challenge for Industry

In 2010, EPA launched the ENERGY STAR Challenge for Industry (Challenge) to help inspire and reward industrial sites that improve their energy performance. The Challenge was created to be a resource that would reinforce the effective energy management practices outlined in the ENERGY STAR Guidelines for Energy Management while providing recognition for achievements to a wider range of industrial plant types in a user-friendly format. To promote and support SEM practices, the Challenge requires the following steps: identifying a plant-level energy intensity metric to measure performance; establishing an energy performance baseline; setting an energy intensity reduction goal; making a public commitment to achieve the energy intensity reduction goal; identifying and implementing actions to reduce energy use and intensity; creating management practices to ensure accurate tracking of energy performance over time; verification of energy performance and savings upon achieving the reduction goal; and, pursuing continuous improvement by re-taking the Challenge once the initial goal is achieved.

The Challenge requires participants to measure and track their performance using an energy intensity metric, such as MMBTU/unit of production, which emphasizes energy efficiency.[11] For the denominator of the energy intensity metric, EPA recommends that sites select a value that captures manufacturing activity and is already tracked. Common examples include units produced, tons of product, labor hours, and so on. For sites where HVAC, lighting, and other non-production energy loads represent 60% or more of energy use, EPA suggests using

[10] See: http://www.energystar.gov/guidelines.

[11] Since the ENERGY STAR commercial & industrial program addresses all fuels, sites participating in the Challenge must measure and track both thermal and electrical use in a single unit of millions of British Thermal Units (MMBTUs) converted to source energy. This encourages participants to look at the total energy use and performance of their plants as a whole system.

a “buildings-based” metric (in the unit of square feet) and normalizing for weather. Sites that use more sophisticated energy intensity metrics based on statistical models are permitted to use those metrics for the Challenge if the metric is not adjusted for sales or revenue. Most sites participating in the Challenge have used or modified existing energy key performance indicators (KPIs) to participate in the Challenge. However, for sites from companies with limited energy management experience, establishing a metric for the Challenge has introduced them to a new approach for measuring their energy performance beyond just monitoring their energy bills.

The Challenge uses a standardized goal of a 10 percent reduction in annual energy intensity achieved within five years of the baseline period. This goal was selected based on EPA’s observation of energy intensity reductions among ENERGY STAR industrial partners. While EPA recognized that this goal could be challenging for some energy intensive sectors or companies with well-established programs, for most plants EPA believed the goal would be achievable. The use of a standardized goal eliminates the administrative burden of reviewing and approving individual goals for all plants taking the Challenge. Additionally, it creates a common objective for all participating and an element of competition by seeing who can achieve or surpass the goal within the least amount of time.

To take the Challenge, sites register their energy intensity baseline with EPA through an on-line registration form. EPA adds the plant’s name to the list of Challenge takers. Sites have access to the full set of EPA’s ENERGY STAR tools and resources, including the Energy Treasure Hunt Guide which supports a site’s pursuit of energy savings. However, EPA does not provide financial or on-site plant assessments. Sites are encouraged to use existing technical resources and to conduct energy treasure hunts to identify operational, behavioral, and low-cost energy savings opportunities.

Tracking and monitoring progress towards an energy goal is a fundamental energy management practice that participation in the Challenge helps to reinforce. However, once a site takes the Challenge, it is not required to report progress in meeting the goal. It is the site’s responsibility to track and measure its own energy performance while maintaining the data that will be required for the verification process for recognition. In this regard, the Challenge is designed to create an incentive for sites to properly track their energy performance over time and maintain their records. EPA offers the spreadsheet-based Energy Tracking Tool to help sites that lack an internal tracking system for managing their energy data. However, sites may use existing energy tracking systems already in use.

When a site achieves the Challenge, a licensed Professional Engineer verifies the energy Intensity reduction and certifies the EPA-required “Statement of Energy Improvement”.[12] The information is submitted to EPA as part of the application process. Sites that achieve the Challenge are issued a certificate, electronic graphics, and other materials for communicating the site’s achievement. The site is encouraged to take the Challenge again and continue its efforts to improve energy performance.

Since the launch of the ENERGY STAR Challenge for Industry in 2010, as of December 2016, the Challenge has been taken over 1330 times and achieved over 420 times by meeting surpassing the goal of a 10% reduction in energy intensity within five years or less. The average energy intensity reduction among all achievers is actually 19.7% in two years or less. Challenge achiever sites have saved over 73 trillion BTUs of source energy and prevented over 14 million

[12] For more information on the role of the Professional Engineer in the verification process, see: https://www.energystar.gov/buildings/tools-and-resources/energy-star-challenge-industry-professional-engineers’-guide-validating

metric tons of CO2e, while saving an estimated $371 million in energy costs. The materials submitted by plants applying for Challenge achiever recognition allow EPA to document the environmental results associated with achieving the reduction goal; however, application materials do not enable EPA to assess the impact the Challenge has had on a site's energy management practices.

Assessment Methodology

To evaluate whether the Challenge has helped establish or reinforce effective energy management practices, EPA conducted a survey of the Challenge achievers in the Fall of 2016. The survey was designed to examine the impacts the Challenge has had on participants' energy practices, tactics used for achieving energy savings, and the types of strategies used to find savings. The survey was sent to the contacts for 320 plants that achieved the Challenge, of which 45% responded to the survey.[13] To gauge the extent of energy management practices at sites participating in the Challenge, the survey looked at the participants' energy management practices before and after taking the Challenge.

Findings

1. Companies/plants with established SEM practices were more likely to pursue recognition and better integrated SEM practices following the Challenge

Most respondents reported having established energy practices prior to taking the Challenge. This is not surprising considering many of the participating plants in the Challenge are part of corporate energy programs that have been involved with ENERGY STAR for many years.[14] As Table 1 shows, about 30% respondents reported having limited or informal programs prior to the Challenge. All facilities reported having a focus on energy projects or management, both before and after participating in the Challenge. After achieving the Challenge, 90% of respondents reported having established energy programs and teams.

Table 1. Energy management practices before and after

Extent of energy management practices	Before the Challenge (% of respondents)	After the Challenge (% of respondents)
No focus on energy management or projects	0	0
Limited focus on energy management or projects	14%	0[15]
Informal energy team	16%	10%
Established energy program & team	70%	90%

[13] The difference between the total number times the Challenge has been achieved and number of contacts at achiever plants reflects that some plants have achieved the Challenge more than once, some plants have been closed, or a current contact for the plant was no longer current.
[14] ENERGY STAR offers a partnership program for industrial companies that provides tools, resources, networking and guidance on energy management best practices since 2000. Companies typical participate at a company-wide or corporate level rather than as individual plants. See: www.energystar.gov/industry.
[15] Here a zero response indicates that company moved from having a limited focus on energy management to forming an energy team or establishing an energy program.

2. Recognition enhances SEM practices and were most useful in generating positive communication and increasing energy awareness among company staff.

To assess the degree to which the Challenge influenced an energy management program, the survey asked respondents to rate the impact the Challenge had on driving additional savings, building organizational support, and promoting SEM practices. These responses are summarized in Table 2.

Table 2. Impacts of the Challenge on supporting the energy program.

Survey Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Weighted Rank
Drove additional energy savings.	0	0	20%	56%	24%	5
Engaged more staff to participate in the energy program.	0	8%	22%	46%	24%	7
Increased awareness and interest in energy efficiency among facility staff.	0	4%	10%	58%	28%	3
Increased plant management support for energy management initiatives	0	2%	22%	42%	34%	4
Increased corporate management support for energy management initiatives.	0	0	18%	44%	38%	2
Reinforced better energy management practices at the plant level.	0	2%	24%	54%	18%	6
Helped build an energy efficiency culture at the plant(s).	0	4%	30%	54%	12%	8
Generated positive external communication.	0	0	8%	56%	36%	1

The results in Table 2 show that the majority of participants believe the Challenge has had a positive impact in building organizational support for energy management. Given that the Challenge provides recognition for accomplishing a goal, it is not too surprising that "generating positive communications" it has the highest weighted rank among respondents. [16] "Positive communications" is important for SEM because it builds support for energy management across the organization and secures the backing of senior management, which follows as the second strongest impact. Executive backing is critical for energy programs at the facility or company level since energy managers cannot operate and drive additional savings without the support of management. Without senior management support, it is also unlikely that any SEM initiative at the plant level will continue into the future or expand to other facilities within the organization.

Eighty percent of respondents indicated that the Challenge helped drive additional savings and over 70% indicated that the process helped to reinforce better energy management practices. Two thirds of respondents agreed or strongly agreed that the Challenge helped create a culture of energy efficiency at the plant(s) although that statement had the weakest support among the ten statements survey takers were asked to assess.

[16] It is important to note the differences in weighted scores of each statement is relatively minor between most of the statements.

3. Operational & behavioral measures and small technology upgrades yielded the highest contributions to energy intensity reductions

Since the Challenge recognizes facilities that reduce their energy intensity, EPA was interested in understanding what tactics were used to improve performance. In particular, EPA was interested in seeing what role operational and behavioral measures played. Respondents were asked to rank a general set of tactics based on their contribution to the energy intensity reduction at respondent plants.

Table 3. Rank of tactics based on contribution to energy intensity reduction

Tactic	All achievers		Achievers with sustained improvements post-Challenge[17]	
	Rank	Score	Rank	Score
Equipment or technology upgrades (small capital or expense budgets)	1	194	1	147
Process improvements	2	190	3	141
Operational & behavioral measures	3	184	1	147
Major capital investments[18]	4	169	4	128
Production increases	5	150	5	112
Other	6	24	6	16

The differences between the tactic ranks based on the scores outlined in Table 4 are relatively small. This suggest that most plants employ a variety of approaches to reduce energy intensity and improve performance, which is not surprising since there is usually no silver bullet in industrial energy efficiency. Surprisingly, the results show that major capital investments are not the most important factor for achieving the target 10% reduction in energy intensity and contributed less than the role operational and behavior measures have in driving savings.

4. Challenge achievers use a variety of resources to identify and implement energy savings measures

EPA was also interested in understanding what resources Challenge achievers used to identify and implement savings since EPA does not support facilities with on-site technical assistance or financial assistance. Most respondents indicated using one or more complementary resources during the Challenge to help achieve energy reductions. Table 4 shows the resources that were most popular. External incentive programs, namely utility programs, were utilized by

[17] Sustained improvements mean the facility continued to reduce its energy intensity after achieving the Challenge.
[18] Respondents were asked to used their own company's definitions for expense, minor, and major capital investments since EPA has observed that definitions for major or minor capital projects vary by company and sector.

approximately two thirds of respondents.[19] Many plants also utilized outside professional technical expertise by engaging consultants and equipment vendors. Over half of respondents used Energy Treasure Hunts to identify savings. Of respondents reporting using the ISO 50001 energy management standard, all were from outside of the US.[20]

Table 4. Resources used to identify or implement energy savings measures

Resources used to achieve the Challenge	Percent used
Utility incentives / rebates (US and non-US plant)	62%
External consultants	62%
Energy Treasure Hunts	52%
Equipment vendors	46%
ENERGY STAR Industrial Energy Guides	36%
ISO 50001	20%
Industrial Assessment Centers / University Assistance Programs	12%
Other (Write-in): *Internal assessments, workshops like energy treasure hunts, monitoring and feedback, specific research by equipment, division & corporate help, internal communications and training, process engineers*	12%

5. Facilities that used resources and tactics that focused on behavioral and operational changes continued to improve energy performance post-Challenge

One of the objectives of SEM programs is to put participants on a pathway towards continuous improvement. To examine if facilities continue to improve their performance after achieving the Challenge, the survey asked respondents to describe their energy performance after achieving the Challenge. 85% of respondents indicated that the energy performance of their facilities continued to improve after achieving the Challenge while 14% indicated that their performance remained flat. EPA does encouraging sites to retake the Challenge after achieving the 10% energy intensity reduction goal, and currently, just over half of achiever facilities go on to retake the Challenge again.

As noted before, EPA was interested in evaluating the role operational and behavioral measures played in helping sites pursue continuous improvement. For sites that reported continued reductions following the completion of the Challenge, it is possible that behavioral and operational changes could have played a key role. Plants with sustained improvement post-Challenge attributed operational and behavioral change among the top reasons for their intensity reduction. (Table 3). The survey also asked plants to rank types of enhancements based on their contribution to energy intensity reductions. *Small capital equipment and technology upgrades* and *operational and behavioral* change tied for first among plants whose efficiency continued to

[19] Of those who are not utilizing utility incentives, half are based outside of the United States. Those who are not utilizing incentives and are in the United States were respondents based in MN, OH, MI, NC, TX and KS. Two respondents using incentives were based outside the U.S. (Canada and South Africa).
[20] Plants outside of the United States and Canada are permitted to participate in the Challenge as long as their parent company is an ENERGY STAR partner.

improve after the Challenge was completed. However, more investigation is needed to further evaluate the use of operational and behavioral measures among Challenge achievers.

The sustained results of these sites are consistent with expectations for facilities implementing SEM practices. With SEM, we expect that sites take advantage of identifying internally generated energy savings opportunities and have a greater sense of accountability to follow through on projects. The use of Energy Treasure Hunts, for example, has employees from different parts of a company leverage their knowledge of existing systems to identify potential energy savings opportunities, which instills a sense of ownership in implementing energy saving projects.[21] These resources tend to help users identify behaviors that led to inefficiencies (such as not having a process for fixing compressed air leaks, not having shutdown procedures, etc.).

Recognition and SEM program design

While there are a few examples of utility SEM programs using recognition, such as Consumers Energy (Glapinski et al 2015), recognition has not been widely used as program design feature as noted earlier. This is not surprising considering that historically utility-sponsored industrial energy efficiency programs have not offered award-based recognition to customers based on achieving a specific level of energy performance. [22] While utility programs frequently develop case studies on successful projects or conduct publicity associated with providing a rebate or incentive, these activities are usually done for program marketing purposes which is distinguishable from operating an awards program that provides recognition for achieving a specific goal.[23]

To explore why award-based recognition programs have not been used more frequently, the authors of this paper conducted a series of interviews with program administrators, contractors, and others knowledgeable about utility industrial energy efficiency programs.[24] While no single main reason was identified, some common themes emerged from these discussions. First, since utility programs tend to be transactional in nature by providing financial incentives that secure energy savings, recognition is not seen as necessary or within the scope of the program. Second, there is a concern that offering awards and recognition will create additional administrative costs. Lastly, since programs tend to run a specific time period (e.g. two years), there is concern about maintaining the continuity needed to run an award program that becomes well known and valued by customers.

The examples described above illuminate some of the challenges utility programs might face with operating their own recognition program. However, none of those interviewed believed offering award-based recognition would be prohibitive from a legal or regulatory perspective.

As utility SEM programs begin to explore more behavior-based approaches in their program designs, leveraging third-party recognition focused on achieving goals, like the Challenge, could largely avoid these issues and is also a logical evolution of utility program design. For example, the CEE database of utility sponsored behavioral programs lists 15

[21] For more information on Energy Treasure Hunts, see: www.energystar.gov/treasurehunt.

[22] In the commercial and residential buildings markets there are utility programs that provided support ENERGY STAR and LEED building certifications.

[23] Marketing is a very important part of any energy efficiency program and materials such as case studies can provide a form of recognition for a program participant. But this is distinguishable from a non-monetary award designed to incentivize behavior, which is the focus of this paper.

[24] The authors interview over 30 people with experience with U.S. utility industrial energy efficiency experience.

industrial programs of which 12 are already using “goal setting” techniques, 10 use some form of social norming, six require some form of public commitments and two use competitions. These behavioral tactics are related to recognition in that they use external validation to affect behaviors either formally or informally. (CEE 2016). Integrating recognition would be consistent with these program models and, considering the results of the Challenge study, can help ensure continuous improvement after leaving the utility SEM program.

Conclusions

The ENERGY STAR Challenge for Industry assessment suggests that recognizing industrial plants for achieving a defined energy goal helps reinforce SEM practices and promotes continuous improvement. Upon achieving the Challenge, sites with limited energy management experience indicated they have formed teams and facility energy programs (finding 1). The majority of plants achieving the Challenge also continued to make energy intensity reductions. (finding 5). Overall, the respondents to the Challenge survey most valued the positive communication and the engagement of management staff from participating in the Challenge (finding 2). Respondents noted that the potential for recognition increased the support of corporate and plant management staff for energy management which is an objective for SEM programs.

To achieve the Challenge, respondents used a variety of resources including utility incentives and rebates, outside professional expertise, and/or self-directed resources such as Energy Treasure Hunts or best practice guides (finding 4). The facilities that continued to reduce energy intensity following the Challenge generally ranked small capital and operational and behavioral measures as more important than major capital investments for achieving reductions. (findings 3 and 5).

Lastly, since utility SEM programs promote goal setting and continuous improvement, integrating existing third-party recognition programs, such as the Challenge which also reinforce continuous improvement, are logical program evolution. As seen with the Challenge, award-based recognition can help to ensure utility program participants maintain focus on SEM practices and continue to improve energy performance, thus improving likelihood of persistence of savings over time.

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