

Personalizing Industrial DSM: Exceeding Expectations through Customer Collaboration

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ABSTRACT

Utilities and program administrators who are interested in increasing participation, program influence, energy savings and customer satisfaction, as well as incorporation of strategic energy management elements into their industrial program(s) should consider augmenting their staff with energy managers.

In 2014, MidAmerican Energy Company's Industrial Partners (IP) program added energy managers to the program team to develop more meaningful relationships with customers, increase participation, and improve program performance. The IP program energy managers were provided and employed by the program implementation contractor, Nexant, and responsible for providing MidAmerican Energy key account managers (KAMs) and IP program participants with a technically and programmatically fluent single point of contact to personalize and tailor the program to their individual needs.

Three years after the energy manager position was launched, it is clear that all the original objectives and a number of unexpected benefits have been realized. Enrollment, participation, program flexibility, influence, and savings have all increased as energy managers have forged collaborative relationships. Beyond quantifiable benefits, the value of satisfied industrial customers who feel they are being well-served cannot be understated.

As the IP program has evolved, so have program participants. Some customers have gradually transitioned to recognizing the value of energy and incorporating it into their internal decision-making processes. Energy managers serve as a catalyst for this change by providing the right mix of technical, programmatic, and interpersonal skills.

Adding energy managers to any industrial demand side management (DSM) program can offer immediate results without requiring major changes to a program's structure or budget. Energy managers are a modular upgrade to any industrial program that adds flexibility and effectiveness through a personalized approach and better positions it for long-term success.

Introduction

MidAmerican Energy is an energy provider serving 760,000 electric customer and 742,000 natural gas customers in Iowa, Illinois, Nebraska, and South Dakota as depicted in figure 1 below (MidAmerican Energy, 2017).



Figure 1. MidAmerican Energy service territory. (MidAmerican Energy).

On an energy basis, 99% of MidAmerican Energy's electric sales and 86% of natural gas sales occur in their Iowa and Illinois service territories (Berkshire Hathaway Energy Company, 2017, 11-16). In these two states, MidAmerican Energy has a strong history of providing a comprehensive portfolio of energy efficiency programs for all customer segments, including industrial customers. Since 2004, MidAmerican Energy has offered industrial customers the opportunity to participate in the Nonresidential Energy Analysis program, focused on promoting and facilitating continuous energy improvement. The Nonresidential Energy Analysis program is now known as the Industrial Partners (IP) program. While there have been significant changes to the program over its 12+ year history, the primary objectives are the same as those outlined in the 2003 energy efficiency plan document (State of Iowa, Iowa Utility Board):

- Establish a proactive program designed to seek out comprehensive efficiency strategies in industrial process applications;
- Develop specialty process expertise to deliver the program;
- Establish a financial incentive strategy that encourages comprehensive efficiency strategies;
- Develop clear processes and guidelines for qualifying prospective customers to maximize the benefits of audit resources; and
- Customize customer analysis reports to provide the information customers need to make business decisions regarding energy efficiency investments.

In addition to the above objectives, the following program attributes have remained unchanged since 2004:

- Nexant, Inc. serves as the program implementation contractor;
- MidAmerican Energy's KAMs serve as the primary marketing channel for the program;
- High customer satisfaction is a key program goal;

- The program’s focus is on capital improvements; limited mechanisms exist to achieve/recognize operations and maintenance savings;
- Participants are eligible for a no-cost, facility-wide energy assessment to identify a comprehensive list of energy-saving opportunities that includes capital investment and operations and maintenance projects;
- Participants are provided assistance managing the list of identified, energy-savings opportunities; and
- Participants are eligible for bonus incentives on qualifying projects, equivalent to the projects’ annual energy savings, in addition to standard prescriptive or custom rebates.

As would be expected with a program as mature as IP, a number of modifications have been piloted over the years. The start of the most recent five-year plan (2014 - 2018) afforded MidAmerican Energy the opportunity to reimagine how the IP program was delivered. Through collaborative discussions over the course of 2013, MidAmerican Energy and Nexant decided that certain program processes/offering could be incrementally optimized to improve an industrial participant’s experience for the 2014-2018 plan, but that the majority of the program’s structure (as it pertained to industrial customers) would remain effectively unchanged. The one important exception to this rule was the addition of energy managers, provided by Nexant, to the IP program roster. At the highest level, IP program energy managers can be likened to utility KAMs in that they work with customers on a daily basis to develop collaborative working relationships and deliver exceptional customer service, however an energy manager’s scope is wholly focused on energy efficiency related items. Energy managers provide a technically and programmatically fluent point of contact for MidAmerican Energy KAMs and IP program participants, and tailor the program for each of these stakeholders by providing:

- A trusted, unbiased resource to deliver technical and program expertise in real-time;
- A program contact to engage and provide value to all levels within an organization (e.g., maintenance staff, operator, plant manager, global energy manager, etc.); and
- A customer-centric approach to program delivery by developing long-term relationships built on trust and transparency.

Today there are five Nexant energy managers that serve IP participants across MidAmerican Energy’s Iowa and Illinois service territories. On average, each Nexant energy manager serves three KAMs and 50 active industrial sites. The performance of the IP program relative to the Nonresidential Equipment program, MidAmerican Energy’s standard prescriptive/custom program, has improved 64% in the three years after their introduction (2014-2016) compared to the three years prior (2011-2013). The value of a program developing meaningful professional relationships with KAMs and participants is tremendous; adding energy managers to any program’s roster is a tactic to immediately enhance the program’s impact without the need to completely redesign the program’s existing delivery model.

The remainder of this paper will discuss and demonstrate the positive impacts Nexant energy managers have had on IP program enrollment, participation, influence, and achieved savings levels, as well as their impact as change-agents on energy-management culture within industrial facilities. Watch this [video](#) to learn even more, and meet one of the energy managers.

Methodology

Dataset

Most of the IP program statistics were obtained using data from Nexant's IP program database, which is used daily to record, track, and report on customer and project activity. This dataset was used to compare program metrics in the three years prior to the introduction of energy managers (2011-2013) and the three years after their introduction (2014-2016). The data presented below includes program activity in both Iowa and Illinois, but is solely limited to activity at industrial sites since the number of commercial sites served has varied significantly over the years due to portfolio-level plan modifications.

Project Review Types

A number of figures in this paper report on the total count and/or savings magnitude of project reviews as an indication of customer participation. Project reviews are binned by the year the review was initiated from 2011 to 2016. In other words, a project review initiated in 2015 but closed in 2016 will be treated as a 2015 review. Additionally, since multiple reviews may occur on a given project, that project may be recognized or counted multiple times in a specific year or across multiple years in this paper's figures. The maximum number of reviews per project for this analysis was limited to three, including two proposed –project reviews prior to project implementation (preliminary analysis and preapproval reviews), and one possible review after project implementation (completed-project review). Prescriptive projects do not require preapproval; many are completed without undergoing a proposed-project review.

Natural Gas Impacts Ignored

Additionally, our analysis only considers electric savings for the purpose of measuring performance. Natural gas savings impacts have been ignored because the majority of MidAmerican Energy's large industrial customers, those targeted for participation in the IP program, do not contribute to the natural gas, energy efficiency portfolio budget since they purchase their natural gas through third-party suppliers.

Lighting Impacts Ignored: The Rise of LEDs

Over 2011-2016, the date range analyzed for this paper, the IP program has seen the popularity of LED equipment soar. Consistent with the U.S. Department of Energy funded solid state lighting market studies (U.S. Department of Energy 2012, 2014), the rate of adoption of LED products among IP program participants has dramatically increased as demonstrated by figure 2 below. As the quality and efficacy of LED products have improved and prices have dropped, IP program participants have been afforded a previously unavailable opportunity to save energy on a scale that has significantly impacted their achievable energy savings potential. Due to the dramatic impacts the rise of LEDs has had on the IP program over the evaluated time period, we have isolated or excluded all lighting-related projects from our analyses whenever possible. Excluding lighting allows conclusions about the impact of adding energy managers to a program's roster to be more confidently drawn by eliminating any chance that the impacts of this disruptive innovation are misinterpreted as energy manager-driven.

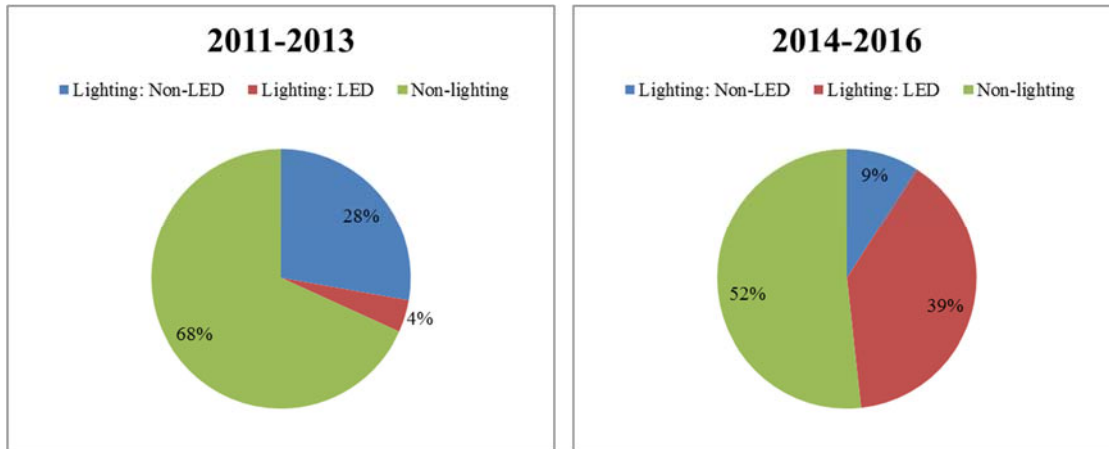


Figure 2. Percent of completed-project savings by end use initiated prior to (2011-2013) and after (2014-2016) the addition of energy managers.

Meet Your IP Program Energy Manager

The mission of an energy manager is to make the IP program approachable, understandable, and valuable to industrial customers. To be successful, an energy manager must possess the right mix of technical aptitude, interpersonal skills, business acumen, and, of course, a passion for energy efficiency. Energy managers should be well-spoken, gregarious energy engineers with excellent project management skills who have industrial-related technical expertise and experience working with or for industrial customers. Placing qualified individuals that embody all the key characteristics is crucial to maximizing the potential benefits that investment in energy managers can bring to any program.

On a daily basis, the IP program's energy managers serve as a nucleus of technical and programmatic information. They are continuously collecting and providing information to the various program players, which includes customers, KAMs, program manager(s), trade allies, and project processing staff (technical and administrative). Energy managers are a personalized, knowledgeable, on-call resource. Having a single point of contact available to explain program nuance and complexity has led to deeper personal relationships built on trust and transparency with both customers and KAMs. The working relationships developed by energy managers help personalize the program and provide a more positive experience that feels much less like filling out a form and waiting for a rebate to show up, and more like signing up to have an energy efficiency advocate in your corner. Putting a face to the program also increases accountability; customers and KAMs know there is someone there for them who is standing behind the decisions.

A customer's relationship with their energy manager often begins with an explanation of the program's value proposition and identification of energy-saving opportunities. Many times the project identification process is accompanied by the energy manager vetting the projects or calculating economics in real-time. The relationship then moves to co-management of the identified-project action plan; a critical component of strategic energy management. If a customer shows interest in further evaluating a project, the energy manager will pair the appropriate program service to the task-at-hand, gather technical details required to accurately/efficiently complete project review, and answer any questions about program mechanics or processes. When appropriate, energy managers also leverage the breadth of their

position to promote cross-pollination across participants by arranging inter-/cross-organization site visits.

In their capacity as a personalized information resource, energy managers have become an indispensable component of the IP program that has allowed the program to build and maintain relationships with customers and KAMs, improve processing efficiencies by removing bottlenecks and inefficiencies, and tailor delivery of the program to each customer and KAM based on their unique likes and dislikes. By developing relationships, improving processes, and personalizing delivery of the program, IP program energy managers were able to have an immediate positive impact.

Customer Engagement Impacts

Customer Enrollment

Customers enroll into the IP program by filling out a simple, one-page enrollment application, with outreach to non-participants done almost exclusively through MidAmerican Energy KAMs. In order to effectively market the program to potential participants, KAMs need to have confidence the program will be a value-add for their customer and the knowledge to effectively communicate the program's value proposition.

KAMs have many responsibilities outside of energy efficiency; marketing programs to non-participants is just one bullet on a much longer list of responsibilities. Prior to energy managers, some KAMs simply didn't have time to fully educate themselves on the value the IP program could provide but were aware that participants would be required to commit additional time and resources. As a result, many KAMs were hesitant to introduce the IP program to potential participants, and enrollment into the IP program had plateaued prior to 2014. Energy managers were able to affect a spike in program enrollment from 2014-2015 by providing increased program knowledge and confidence to KAMs as shown in figure 3 below. In addition, energy managers participated in KAM-organized meetings with customers to discuss how the IP program could be a benefit to their organization.

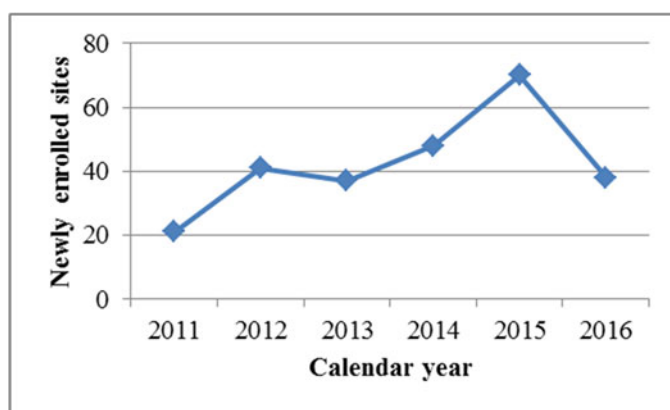


Figure 3. Number of new industrial sites enrolled into the IP program by calendar year.

We believe that the reduction in sites enrolled in 2016 is the result of effective, comprehensive outreach in 2014 and 2015. Over this time period KAMs and their energy

managers effectively depleted the pool of non-participating, managed account sites to which the IP program had not been convincingly marketed.

Customer Participation

New enrollees are only half the customer participation story. Once a site has been enrolled into the IP program, its level of activity is tracked. Customers with activity within the past 12 months are listed as ‘active’ while those with no activity within the past 12 months are listed as ‘inactive.’ Over the course of a customer’s participation in the IP program, they can shift between an active and inactive status an indeterminate number of times.

Prior to energy manager involvement, program participants were primarily responsible for managing their engagement with the IP program, with limited program-provided outreach. Customers were responsible for regularly reviewing the list of identified projects, deciding which to pursue next, and submitting an application to initiate a project. As industrial customers are stretched thin, this approach limited participation because many industrials were unable to spare the managerial expertise or allocate the time needed to effectively manage energy even after the program had identified a comprehensive list of cost-effective opportunities (Russell, 2013; Kolwey, 2013).

Starting in 2014, Nexant energy managers began active outreach to program participants to assist in managing each customer’s identified projects, and guide them through the appropriate program steps. Regular customer-energy manager collaboration provides the emphasis on energy needed to keep it included as a consideration during internal decision-making meetings, shines a light on the opportunity-cost of waiting and improves the customer’s level of satisfaction with the IP program. Through this long-term strategy of regular and sustained outreach, energy managers have empowered program participants to more consistently and frequently leverage the program and consider energy impacts during decision-making. Figure 4 below demonstrates how energy managers were able to increase the number of active sites enrolled in the IP program by attracting new enrollees to the program and by keeping existing customers actively engaged.

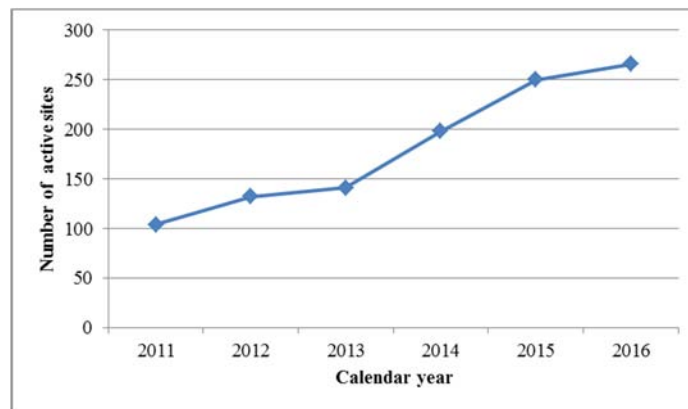


Figure 4. Number of industrial sites active in the IP program by calendar year.

Customer-Centric Impacts

The addition of energy managers to the IP program allowed customers to more fully and easily leverage experienced program engineering staff who are available to help identify, vet, prioritize, and manage projects. Nexant energy managers are fluent with all the ‘tools’ in the program’s toolbox of services, have added new tools, and are able to quickly and effectively pair a right-sized program service to the customer’s need. Customers now have visibility and convenient access to the scope of technical evaluation services available to them and are able to more fully utilize the IP program as an extension of their engineering bench. Access to the full suite of program services has increased the IP program’s ability to provide timely and situation-appropriate energy analyses to program participants, allowing the program to be more influential in the customer’s decision-making process.

There are a variety of ways that Nexant engineering staff is available to help customers evaluate identified projects under consideration (i.e., proposed projects). Today the IP program has three primary, proposed–project evaluation services which include:

- Real-time energy manager feedback
- Preliminary analysis
- Preapproval review

With guidance from their energy managers, program participants can take advantage of one, two, or all three of these services in order to help inform business decisions.

Often when a program participant first approaches their energy manager on an energy-saving project they are considering, the scope of work is not well-defined and the customer is simply looking for unbiased feedback to orient themselves to determine if further consideration is justified. Energy managers can often provide immediate feedback by utilizing their technical knowledge or by drawing on knowledge gained on similar projects they’ve been involved with at other customer sites. Alternatively, the energy manager can leverage the program’s engineering staff to provide a preliminary analysis. The analysis incorporates what is known about the project with reasonable engineering assumptions to provide timely feedback to the customer on one or more project implementation approaches. Once a project’s scope and costs are well-defined, the customer can have a formal preapproval conducted to provide the most accurate visibility into the project’s economics. This suite of energy manager-guided services allows the program to provide the customer valuable feedback in a manner that is tailored to the customer’s wants/needs; increasing the program’s value to the customer and the customer’s satisfaction with the program. Combined with the energy manager’s ability to leverage their customer and trade ally relationships to more quickly obtain project data, these services maximize the program’s efficiency by minimizing the amount of time required to provide valuable information to a customer. The most significant and impactful change that allowed for the large reduction in project review delays shown below, in figure 5, was the introduction of energy managers.

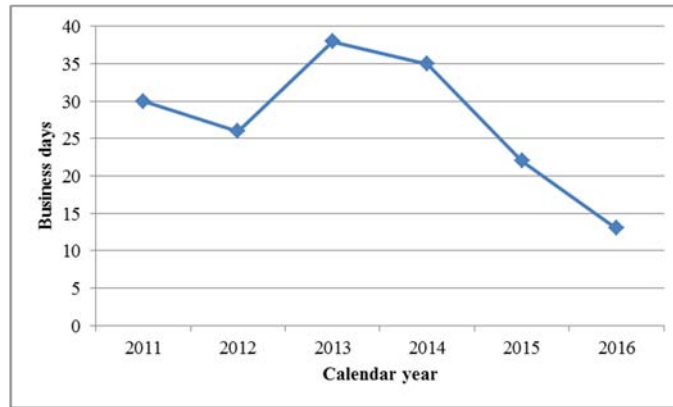


Figure 5. Median business days a project review was delayed while the IP program awaited delivery of requested data.

It is worth noting that prior to 2014, customers did not have access to the real-time energy manager feedback or preliminary analysis services. In fact, the preliminary analysis service was launched in response to direct feedback from energy managers based on their experiences in the field. By enriching and increasing access to the project evaluation services, the addition of energy managers increased the value the IP program can bring to participants.

Increased access to a more tailored suite of proposed-project evaluation services has led to an interesting shift in the relationship between proposed and completed non-lighting project reviews as shown in figure 6 below. Prior to energy managers, more completed-project reviews were received in a given year than proposed-project reviews¹; once energy managers began providing program services, there was a sharp spike in the number of proposed-project review requests. There has been nearly a 1:1 relationship between the number of proposed- and completed-project review requests ever since.

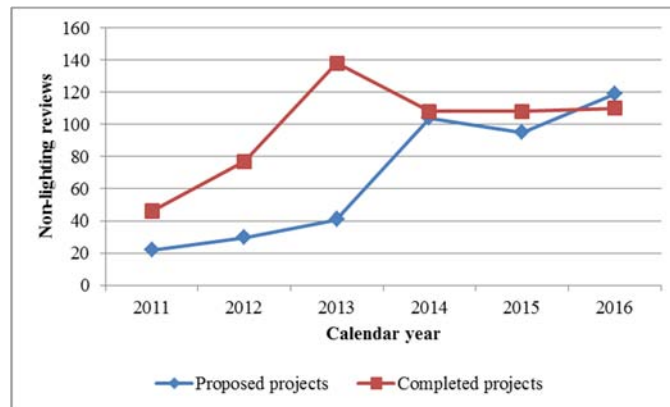


Figure 6. Number of non-lighting reviews initiated by project type.

Consistent with the project count trend above, a similar trend is seen with reviewed energy savings as shown in figure 7 below. Prior to 2014, the cumulative electric savings of

¹ Note that prescriptive projects do not require preapproval, making it possible for there to be more completed-than-proposed-project reviews

completed-project reviews requested in a calendar year always exceeded the proposed-project savings value. However the inverse became true once energy managers were added to the IP program roster. The significant increase in proposed-project savings that began in 2014 resulted in a nearly 2:1 relationship between the magnitude of reviewed proposed- and completed-project savings in 2015 and 2016. Note that 2013 was an outlier year in terms of the number of non-lighting, completed projects reviews initiated and total savings associated with those projects; the specific reason for the increases is assumed to have been due to global economic factors, end-of-plan program promotions or other influencing variables.

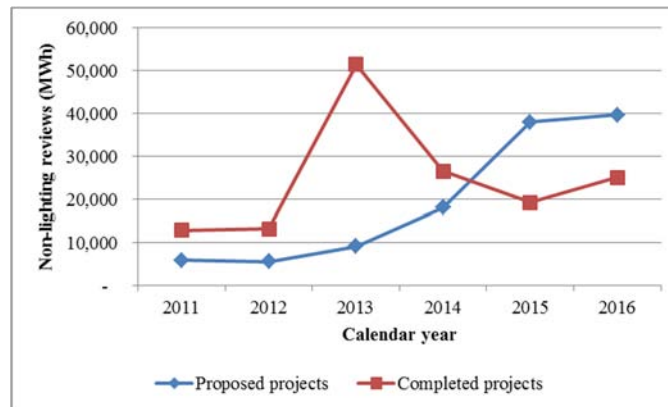


Figure 7. Savings of non-lighting reviews initiated by project type.

Our interpretation of these data is that while we cannot control the many variables that impact if/when an industrial customer chooses to implement an energy-saving project (e.g., corporate budgets, prioritization of resources on LED projects, global markets, etc.), we can impact the availability of high quality evaluation services for proposed projects. By improving the availability and quality of the evaluation services through the addition of energy managers, we've increased the frequency with which program participants look to the program as a trusted consultant for unbiased feedback. Working with customers early and often to evaluate projects as they are developed is a customer service that positively impacts the program's level of influence and participants' level of satisfaction with the program.

Proposed-Project Trends

As IP program participants increasingly look to the program for help evaluating projects under consideration, some interesting project end use and size trends have emerged. Gains were seen in the number and savings of proposed-project reviews in all end uses as seen in figures 8 and 9 below. On an absolute basis, the biggest non-lighting increases were seen within the *motors/variable speed drive (VSD)* and *compressed air* end uses, while on a percentage basis, the largest gains were seen in the *process heating/cooling* and *process improvements* end uses.

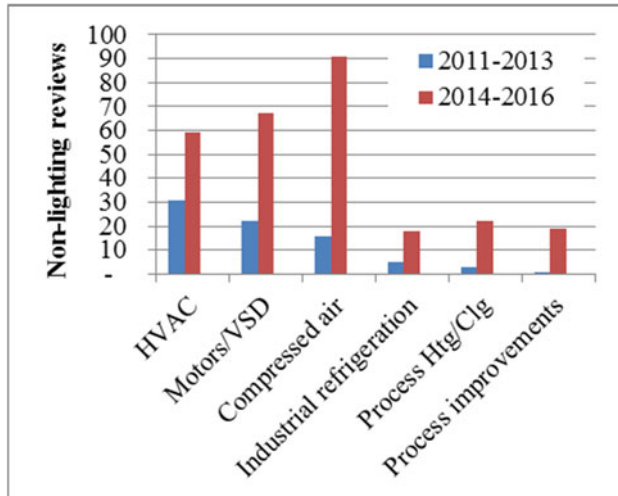


Figure 8. Number of proposed-project reviews initiated from 2011-2013 and 2014-2016 by end use.

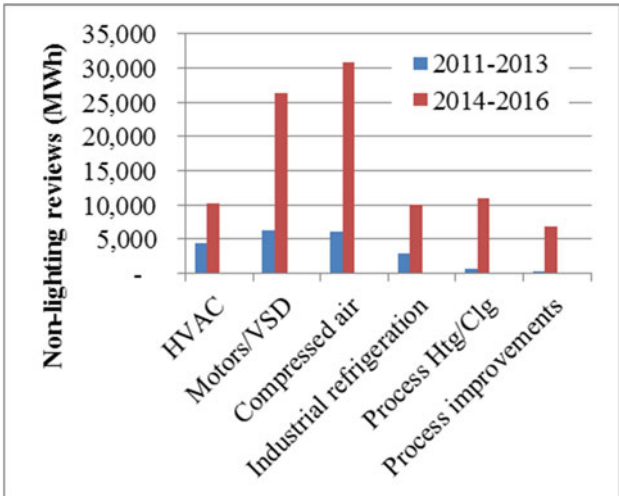


Figure 9. Savings of proposed-project reviews initiated from 2011-2013 and 2014-2016 by end use.

Note that, for clarity, the above graphics exclude *building shell*, *water heating* and *other* end uses due to their insignificant impact on reviewed savings.

The proposed-project reviews that drove the sharp increase in 2015 and 2016 savings seen in figure 7 above were those with savings $\geq 1,000$ MWh as shown in figure 10 below.

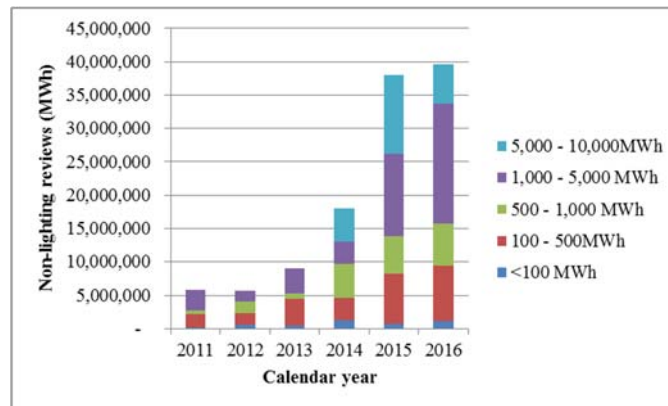


Figure 10. Savings of proposed-project, non-lighting reviews initiated by size bin.

Realized Savings Impacts

From 2014-2016, the IP program has enjoyed steady growth in achieved savings from installed, non-lighting projects as shown in figure 11 below. We expect this trend to continue given the increase in the number and size of proposed-project reviews that have occurred after the addition of energy managers to the IP program.

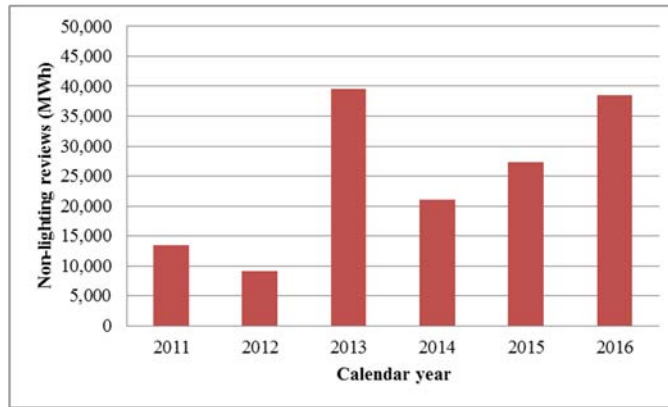


Figure 11. Savings of non-lighting, completed-project reviews achieved annually.

To further investigate the impact of energy managers, we compared the performance of the IP program relative to MidAmerican Energy’s Nonresidential Equipment (NE) program in Iowa. The NE program offers standard prescriptive and custom rebates to any non-residential customer not participating in one of the enhanced services programs like IP. The NE program can be used to control for the many variables that impact the performance of programs in a utility’s portfolio in any given year – e.g., emergence of a disruptive innovation, statewide economic trends, incentive level changes, etc. Figure 12 below shows the significant, 64% improvement in industrial savings achieved through the IP program relative to the NE program in the three years after the addition of energy managers (compared to the three years prior). Unlike many of the preceding figures, the savings values in this figure include lighting impacts because NE program performance metrics by end use was not available.

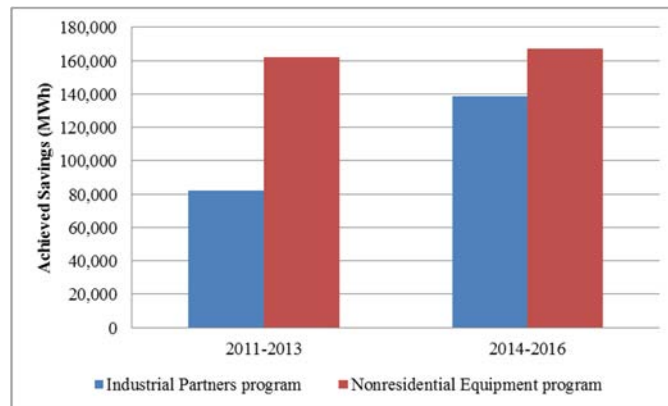


Figure 12. Performance of the IP program indexed to the NE program before and after the addition of energy managers.

Conclusions

Industrial sites are looking to improve their bottom line, optimize operations, and meet corporate sustainability goals, while DSM programs are looking to deliver impactful and effective industrial programs. Many programs around the country support the placement of energy managers within organizations to provide internal resources intended to champion energy efficiency and impact the culture of those organizations (Russell, 2013). The IP program has

found success with external energy managers who are employed by the program and serve groups of industrial facilities. The addition of energy managers to the IP program informed program enhancements and increased participation, influence, savings, and customer satisfaction without requiring major modifications to structure and budgets.

The IP program's external energy manager model offers convenient flexibility. IP program energy managers have the ability to adjust their level of service with a particular customer as the customer's motivations and availability wax and wane, allowing the program to most cost-effectively focus program resources. Program participants receive the benefit of adding an energy manager to their team, and are able to experience the value, without the inconvenience of legal contracts or looming deadlines. The result of this approach has been the development of collaborative, mutually beneficial working relationships between program participants and energy managers.

Understanding how to cost-effectively move beyond the project-by-project capital budget cycle of energy savings and shift a company's culture to that of strategically managing energy is our goal with each participant. While the external energy manager model cannot be as effective at cultural change as an internal energy champion, there have been a number of instances where IP energy managers have observed customers who have embraced the concept of strategic energy management and shifted from rarely to regularly considering energy impacts in their decision-making processes. Once customer management is supportive of providing a platform for energy costs to be considered in operations and project proposals, the customer's culture is primed for successful management of energy.

IP program energy managers may not be embedded within a customer's company, but existing outside an established culture, on-balance, has been advantageous. External energy managers can draw upon their breadth of experiences across program participants to guide individual facilities towards approaches that have been successful elsewhere. Energy managers have been a modular enhancement to the IP program that has provided the flexibility to adapt to changing stakeholder needs and add value. They can be quickly and easily added to any program to increase customer satisfaction and improve program performance.

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