# Onsite Energy Manager Pilot Programs: A Survey of Practices and Lessons Learned

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## Executive Summary

The placement of empowered, professional energy managers is prerequisite to the implementation of industrial energy management standards, policies, and programs. The viability of any policy is largely dependent on a visible and motivated constituency. Energy managers will play pivotal roles not just in creating value within their companies, but in enabling the pursuit of industrial energy efficiency policies and goals.

Currently, however, leadership within industrial facilities may be the largest piece missing from the energy policy and program landscape. Most manufacturing organizations are not accustomed to managing energy consumption, and in today's competitive economic environment, companies are wary of adding to their human resource head count. Add to this the fact that energy is one of many initiatives competing for management attention and resources. To date, energy issues have been delegated almost entirely to technical people, who focus on equipment selection and engineering projects. While the technical focus is no doubt crucial, it does nothing to address the organizational barriers that may arise in response to proposed technical changes.

Energy program administrators are sponsoring the placement of dedicated energy managers at industrial facilities to overcome the obstacles to energy optimization. These pilot efforts seek to accelerate the pace and volume of industrial efficiency initiatives. This report describes five existing programs. The intent is to boost awareness of this program concept, which could be a critical component of future energy policy and program design.

Thanks to their experience with pilot programs, some facilities are hiring and even expanding their cadre of energy managers. By facilitating the creation of energy manager positions, these energy programs are also building the professional population that can become visible advocates for emerging energy policies and industry protocols such as the ISO 50001 energy management standard.

Some key lessons and conclusions result from these pilot programs. In all cases, the onsite energy manager initiative is perceived not as a goal in itself, but as a means to an end. Sponsorship of energy manager salaries and related costs allows participating companies to reveal—often for the first time—the scope of value embodied in their energy use. Their traditional concern has been the *cost* of analysis and remediation. They are now able to move beyond cost to evaluate potential cash flows. Program sponsorship dispels the perceived risk of wasted time and resources that would result from the unprecedented expense of energy management. In effect, program sponsorship accelerates the learning curve experienced by organizations that progressively adopt strategic energy management competencies.

## Introduction and Background

Energy program sponsors are beginning to support the placement of full-time energy managers within non-residential facilities. Most of these programs are pilot initiatives with short histories. These programs are appearing because many facilities, especially in the industrial sector, are unable to spare the managerial expertise needed to identify and fully exploit their energy improvement potential.

Traditionally, industrial energy efficiency programs have focused on hardware and equipment. Program efforts may entail energy assessments of facility buildings and their major mechanical and electrical systems. It is also common to provide feasibility and design studies to support individual energy projects. Assistance of this nature has certainly prompted the implementation of many energy efficiency improvements. However, evidence suggests that much efficiency potential across industry remains untapped (Russell 2010), due in large part to conflicting organizational priorities that prevent proposed changes. These are "change management" issues—tasks that cannot be addressed with technical skills and hardware alone. The role of an energy manager is to determine *what* improvements an organization can achieve, and *how* staff can work collectively to achieve them.

Strategic energy management—as a dedicated, ongoing pursuit—anticipates a *process* of continuous improvement, relying as much on organizational procedures as it does capital projects. This approach demands more than simply creating random projects as time and resources permit. Energy can be managed just like labor, cash, raw materials, and other industrial resources. Energy management requires the ongoing inventory of energy consumption, benchmarks for optimal energy performance, and a protocol for directing how and when to implement improvement opportunities. Proposed equipment changes must be guided through rigorous and competitive capital expenditure approval processes. The changes resulting from energy management will impinge upon other organizational agendas. Someone must negotiate these changes when they seem to threaten the long-standing habits and procedures of facility staff. In addition to technical acumen, energy management requires durable leadership and diplomacy skills needed to inspire collaboration while otherwise minimizing resistance to change.

Industrial energy solutions are almost always achievable, both technically and financially. However, a lack of awareness and the capacity to act can stall many of these opportunities. Most organizations are not certain of energy improvements' cost-benefit results relative to other business investment opportunities. Given the competitive pressures imposed on industry today, many organizations are hard-pressed to obtain or reassign staff with the skill set required to be a true energy manager. Without anticipating the potential for organizational change, industrial leaders typically perceive energy efficiency as a mechanical pursuit to be delegated to tradesmen. Unfortunately, tradesmen are rarely prepared or motivated to tackle the change issues that come with energy performance improvement. As organizational challenges accrue, industrial facilities may not be able to pursue energy improvements, even if the measures are adequately documented and supported by investment incentives. To overcome this inertia, some energy efficiency programs are beginning to place energy managers onsite in industrial facilities.

Administrators of five such pilot programs were interviewed for this report in early 2013 (see Appendix A). The survey sought best practices and lessons learned from program activity to date. The findings are intended to guide the design and execution of future programs that foster onsite energy management competencies at industrial facilities.

The programs profiled in these case studies are referred to throughout the text by these abbreviations:

- *(BCH) BC Hydro.* This program covers 75 percent of the cost of each single energy manager placement. About 40 managers are currently placed. The scope of work includes strategic planning, awareness communications, reporting, project feasibility studies, and development. Targets include upgrades of equipment that has not yet reached end of life, as well as operational and behavioral initiatives.
- *(BPA) Bonneville Power Administration.* This program relies on a third-party vendor to recruit facilities that wish to develop an energy manager position. The vendor guides facilities through the application process, which requires the creation of an energy manager comprehensive plan to include updates every three to six months. Companies are reimbursed a fixed rate per kWh saved, subject to a funding cap. This program usually supports the reassignment of existing employees to the energy manager role. A total of 28 managers have been placed to date.
- *(DTE) Detroit Edison.* The DTE program was created to generate additional revenue for the utility. Participating facilities pay DTE to have an outside hire placed on site to generate improvements that yield savings in excess of fees. Not to be confused with an energy service contract format, 10 facilities have enrolled in the 20 years since inception.
- *(WFE) Wisconsin Focus on Energy.* This program provides a staffing grant to facilities that have already documented their major energy improvement needs. Reimbursements are paid upon implementation. The focus is emphatically on projects as opposed to continuous energy improvement protocols. Twenty-eight facilities have been served to date.
- *(UMO) University of Missouri, Missouri Pollution Prevention Intern Program.* Participating facilities pay to have an engineering summer intern placed on site. A quality assurance plan articulates the roles and objectives for the intern's scope of work. Twenty-three interns have been placed to date. This program claims to have identified $1 million worth of annual energy and water savings.

These pilot programs have emerged independently, in isolation from each other both regionally and conceptually. This provides a unique opportunity to examine the features and lessons learned from each example.

## Core Principles

As a business employee, an energy manager seeks to optimize the organization's relationship with the energy it consumes. The energy manager's scope of work is multidimensional, advocating energy performance as it may be advanced through the management of inputs, assets, talents, and procedures. This effort creates value through waste minimization as well as the containment of safety and emissions compliance risks.

The energy management agenda may be summarized as follows (Russell 2008):

- *Resource management.* To the extent that energy is an ingredient of industrial production, energy commodities are subject to procurement criteria such as cost minimization and assurance of content supply and quality.
- *Asset management.* Effective energy use considers not just the inputs of energy commodities, but the strategies for selecting and maintaining the assets that cause energy consumption. This frequently involves a trade-off between hardware costs versus the rate of energy consumption.
- *Risk management.* Industrial facilities are absolutely dependent on energy consumption to achieve their output goals. To the extent that energy supply and quality may be unreliable, production goals are at risk. Similarly, to the extent that energy conversion and use creates safety or environmental liabilities, facilities can face large, unplanned settlement or remediation expenses. Energy management addresses these risks. In the absence of energy management, energy is perceived as a fixed, uncontrollable cost. Facilities adhering to this perspective effectively abdicate their potential to manage risk.
- *Human and organizational management.* Broadly speaking, this entails initiatives to alter operating procedures and behavioral choices in ways that contribute to energy optimization. It explicitly requires the cooperation of managers and staff throughout an organization. Due to organizational complexity, these other managers may have competing priorities that can compromise an energy management agenda. The energy manager's success in this dimension depends largely on his or her analytical and persuasive skills.

## Program Evolution

Government and utility energy programs for the industrial sector have since their inception in the 1970s offered technical support for diagnosing, designing, and engineering energy solutions. By its very nature, technical support stimulates onsite industrial program interaction. To the extent that interaction is confined to discrete projects or events, the assistance can be provided by consulting experts during episodic facility visits. However, intermittent assistance tends to yield intermittent results. Also, the episodic nature of itinerant consulting means that it takes more time for a facility to build confidence and trust in energy program assistance. An energy manager, integral to a company or facility, provides the leadership and organizational continuity for implementing change.

### *FUNDAMENTAL RATIONALE AND FEATURES*

In some regions of the United States, the demand for energy is projected to outstrip the existing capacity for generation and distribution. Utility regulators for these regions can respond in one of two ways. One solution is to boost capital investment in additional energy infrastructure. Such investment drives up the cost of energy provision, imposing a greater burden on ratepayers. Also, the planning and construction of such assets are subject to protracted regulatory scrutiny. The utility industry's concept of integrated resource planning optimizes a blend of supply- and demand-related energy assets. This approach offsets the need to build incremental supply capacity by encouraging consumers to invest in energy-efficient applications. When comparing the per-unit cost of energy provision,

energy efficiency measures are generally cheaper to implement than the construction of new generation and distribution capacity (Chittum & Nowak 2012).

The decision to invest in one power plant, for example, is replaced by a variety of equipment upgrades to be achieved at hundreds or even thousands of energy-consuming facilities located within a utility service territory. At the facility level, energy efficiency upgrades are one of many tasks competing for organizational time and resources. These choices are proprietary and cannot be compelled by law or regulation. Each individual facility's inclination to make efficiency upgrades is balanced against other priorities. Successful implementation is the result of someone's ability to advocate energy improvements to the balance of the organization. An energy manager acts as this advocate, coordinating concept design, engineering, capital budgeting, and—increasingly—procedural and behavioral changes. From an energy policy and program perspective, energy managers contribute to energy reduction goals while also creating competitive cost advantages for their own facilities.

A policy that creates value through the employment of industrial energy managers will serve both regulatory and business agendas. Today's competitive pressures, plus an aversion to the risks associated with change, discourage many organizations from adding labor. The pilot programs described here allow companies to become accustomed to energy management practices with reduced immediate risk. Even the short histories of these pilot programs show that many industrial facilities enthusiastically renew their annual program support contracts. Some facilities are making permanent hires of individuals who were originally program funded.

If energy management is valuable to industry, why should company efforts be subsidized through energy programs? The answer to this question is reflected in the career self-interests of industrial managers. There are always risks involved when proposing change, even if top management direction is given. The very act of creating an energy manager position means that existing resources, authorities, and influence have to be reapportioned. The cost of an energy manager has to be carved out of an existing budget. To be successful, an energy manager will foster both alliances and probably some enemies within the organization. Even if the courage and the will are present, the funds are usually not. The individuals who seriously pursue energy management will invest their own credibility (i.e., "political capital") while facing the risks that come with creating change. To the extent that industry expects energy managers to be recruited from the ranks of tradesmen, we understand why energy managers are few in number. The placement of professional energy managers via program subsidy and support can be a way to facilitate industry's familiarity and comfort with an energy management agenda.

### *COMPARATIVE ANALYSIS OF STRATEGY ELEMENTS*

The onsite energy manager programs studied for this report generally share the following characteristics:

- *A policy mandate.* In every case studied for this report, onsite energy manager programs have been devised for the purpose of supporting larger industrial energy

efficiency agendas promulgated either by utility regulators, a regulated utility company, government policy, or a combination of these.
- *Voluntary participation.* In all cases, industry can opt in at its own discretion. It is not compulsory.
- *Contracts.* A formal agreement document defines and secures the relationship between participating facilities and the program providers. Contracts are for a prescribed period of time, usually for one year, with specified performance goals and deliverables. Most contracts also establish a protocol for progress reviews. Contracts may be with one or more facilities (sites) of a participating company.
- *Financial resources*. In three out of the five programs studied here, the onsite energy manager program provides at least partial compensation to participating facilities to cover labor and related costs. In the remaining cases, the recipient facilities pay for program assistance.

There is wide variation in strategy elements even among the five program examples. In all cases, the onsite energy management initiative is perceived not as a goal in itself, but as a means to an end. It is a service adjunct to a comprehensive energy policy and program portfolio. Three providers (BCH, BPA, and WFE) do not evaluate the onsite energy manager program in isolation. Rather, their program cost-benefit evaluations focus on the overall results of a program portfolio, which may also include incentives, rebates, financing, trade ally relations, and technical support. Accordingly, BCH and BPA manage program funding on a portfolio basis, with the onsite energy manager initiatives receiving flexible funding in response to overall portfolio performance. The WFE program providers vary payouts according to the current availability of worthy proposals. Consequently, the energy manager program funding is variable within the overall WFE program portfolio.

Table 1 provides an at-a-glance comparison of program features and goals.

Expectations of the energy manager vary. BCH remains committed to the continuous energy improvement concept, recognizing the need for consistent leadership to effectively manage the organizational change issues that are the consequence of energy management. The BCH approach requires energy managers to design and maintain performance *metrics*. The remaining programs mark progress by the completion of *projects*, either as asset upgrades or reconfigurations. In addition to its project focus, the BPA program keeps a pulse on total facility energy consumption trends with continuous energy improvement offerings ("Track and Tune" and "High Performance Energy Management;" see Appendix A-2). The remaining programs may consider behavioral and operational change measures, but projects are the first priority. The emphasis on projects is most pronounced in the WFE and UMO programs. Through grant funding, WFE supports tenures of limited duration so that an energy manager can pursue a short list of projects that the facility has already identified and evaluated as a pre-requisite to grant application. As a practical matter, the 10-11 week tenure of student interns means the UMO program is limited to project definition and design.

**Table 1: Comparison of Program Features**

| PROGRAM PROVIDER | YEAR OF INCEPTION | CUSTOMER PAYS | PROVIDER PAYS | INTERN | PROFESSIONAL | OUTCOMES SOUGHT | DELIVERABLES |
|---|---|---|---|---|---|---|---|
| BC Hydro (BCH) | 2002, current incarnation since 2008 | 25% of staffing cost | 75% of staffing cost | | X | long-term strategy, maximize use of incentives | diagnose, prescribe, implement |
| Bonneville Power Administration (BPA) | 2009 | Provider pays staff and project costs up to $0.025 per kWh saved, up to $250,000 max/facility. Customer pays any extra. | | | X | capital projects | diagnose, prescribe, implement |
| Detroit Edison (DTE) | 1993 | 100% of energy manager salary | Insignificant back-office program costs | | X | emphasis on capital projects; behavioral when feasible | value of energy savings in excess of cost for service |
| Wisconsin Focus on Energy (WFE) | 2009 | All preliminary project diagnostic, engineering, and capital costs | 100% of staffing cost for prescribed list of projects | | X | emphasis on capital projects; behavioral initiatives when feasible | project management for projects previously prescribed |
| University of Missouri (UMO) | 2008 | 100% of intern salary | Small amount of customer revenue goes to program overhead. | X | | capital projects | diagnose and prescribe only |

Eligibility criteria for program participants vary in their degree of scrutiny. Criteria are formulaic only to a limited extent. Often, the programs seek participants that are merely "large customers." WFE further refines grant applicants by scoring them on a 0–100 scale, with points accumulating as follows: (40) cost effectiveness; (25) need for support; (20) staff qualifications; (10) quality of feasibility studies compiled in advance of the application; (5) likeliness of on-time performance, and a 10 point bonus provided to first-time applicants. Program administrators attempt to prioritize their outreach to potential applicant facilities. Toward this end, utility company key account managers are especially helpful since most have accumulated familiarity with the people and history of these facilities. In several cases (BCH, BPA, DTE), subjective input from account reps is used to augment any formulaic criteria for qualifying program applicants.

When a company considers creating an energy manager position, only a few employees are engaged in the decision. Other key decision-makers are likely unaware of the pending new hire and are not yet invested in the outcome. This explains why three programs (BCH, BPA, and WFE) provide funding to pay for most or all of the cost of the energy manager. A facility staff's acceptance of the energy manager concept may rely on *who the person is*, as well as *what the person will do*. Program administrators usually offer funding support plus ample communication from the onset to "sell" the program concept. BPA and WFE purposely attempt to make the concept more palatable by appointing an energy manager from the ranks of existing facility staff whenever possible. There is some comfort in having a "known entity" as opposed to an outsider with an unknown (and therefore threatening) presence and agenda. Also, the incumbent employee has the advantage of already being familiar with the facility for both its physical and organizational features.

The same challenges inspired a different strategy at DTE and UMO. These programs ask participants to pay for the service. Applications and contracts are still used. Both programs place outside hires. The UMO program places a summer intern engineering student, while DTE places either a consultant or a DTE employee. The UMO intern, however, has a tenure of only 10-11 weeks. This has both pros and cons. On one hand, the intern is far less threatening to incumbent staff interests. The intern is necessarily project-focused, having neither the time or influence to effectively address any change management issues.

Contracts are central to provider-participant relationships in all programs. The contracts establish roles and deliverables and some description of preferred outcomes. While contracts attempt to structure the program roles and responsibilities, the providers also realize that an additional mechanism is needed to accommodate the unexpected. The BCH and BPA programs have particularly strong protocols for periodic progress reviews.

Depending on the program, a contract's scope may cover one or multiple facilities for one company. Some applicants may anticipate using the energy manager to serve multiple facilities, some of which are located outside the provider's service territory. As a practical matter, program success depends largely on the energy manager's ability to forge working relationships with other stakeholders throughout their organization.

Program goals can be demanding in some cases. BCH, BPA, and WFE contracts stipulate that compensation to participating facilities is linked to performance, that is, the volume of savings accomplished by installed measures. The DTE and UMO programs do not set performance goals. Rather, a participant is obligated to pay for service in anticipation that some unknown value will be created. Note that both the DTE and UMO programs require the applicant to document an improvement agenda, or to at least describe the outcomes they anticipate from program participation. The WFE program is demanding in its requirement that an applicant must secure project feasibility studies refined to a +/- 10 percent performance estimate as a prerequisite to winning a staffing grant award.

Reimbursement strategies also vary widely. In addition to investment incentives (up to 70 percent of project costs), BPA pays out $0.025 per kWh saved for all other costs including the energy manager salary and relevant training, as projects and measures are implemented. The savings are tabulated according to the feasibility studies compiled for specific projects and revised according to final monitoring and verification of achieved savings. BCH

payments are disbursed by formula as hours are applied by the energy manager. Specifically, 50 percent of BCH disbursement covers reporting and planning, 15 percent covers awareness communications and energy monitoring, and 10 percent covers project management. The remaining 25 percent is the facility's responsibility. This scheme effectively splits the duties and the risk between the program provider and the participating facility. BCH essentially pays for the "new" administrative duties that energy management creates, while the costs of implementation fall more directly to the facility.

The programs vary in their approach to impact evaluation. Most of these programs are still too new to have collected comprehensive energy savings metrics. Due to capital budget cycles and a host of other factors, the lag time between the identification of improvements and their actual implementation can take months, if not years. The poor economy that has prevailed over the 2008–2012 period has had mixed effects on industrial energy programs: on one hand, industry is more interested in identifying cost-saving potential (Randazzo, 2013). Conversely, capital shortages are blamed for a slower rate of implementation.

Only some programs are able to offer descriptions of energy saved. The UMO program relies on participant surveys to self-report their implementation activity. Information collected this way describes over $1 million in annual savings, which includes water and electricity. BPA has achieved 16.6 average MW savings through March 2013. The WFE program similarly relies on self-reported data from facilities, although this effort is backed up by random sampling performed by program administrators. WFE program results for 2010 describe 278,872 in annual MMBtu savings implemented (plus 737 kW capacity reduced) at a staffing grant cost averaging $0.91 per MMBtu. The DTE program is an anomaly. By virtue of its concept, the DTE program focus was to generate revenue for the utility while boosting customer satisfaction. Success simply meant that a customer would renew the energy manager contract for another year. This is currently changing as DTE is beginning to track program efforts that support regional energy policy targets.

Because energy savings data are currently lacking, program success for the pilot efforts may be best measured by enlistment rates. The BPA program claims a re-enlistment rate above 50 percent, with some facilities in the second or third contract year. While BCH indicates no program drop-outs to date, there is little evidence that energy manager positions have become self-sustaining. The UMO program claims success in that some of the intern positions become full-time jobs.

## Challenges

Energy competes with production, safety, quality, and other issues for management attention. Most program providers wish to engage top company or facility leaders to support this initiative, but often to no avail. Energy managers must then elicit the buy-in of various middle managers by building on iterative rounds of small successes. Top management attention and support is more likely after some initial success is evident. Facility culture is also a factor. Some have already developed best practices and standard operating procedures that foster efficiency criteria. Others simply lack such a culture, and program providers are learning to triage prospective applicants accordingly.

Many applicants still perceive energy optimization as a distraction from "business as usual." Energy program administrators sometimes labor against the perception that a successful energy manager will simply work him or herself out of a job by completing a punch list of projects. The BPA program administrator notes that program drop outs are often those facilities that see energy efficiency as nothing more than projects. Program providers may still engage such facilities, hoping that the energy manager can persuade the balance of the facility to evolve its thinking to embrace continuous improvement.

If energy cost control is perceived as an episodic "project," the durability of results are at risk as facility staff may lapse into old habits. This reiterates the need for the sustained, holistic approach embodied in strategic energy management. While BCH especially tries to encourage continuous energy improvement, most other programs effectively surrender to the project-based approach. Administrators of the WFE program are particularly wary of the persistence of behavioral and procedural change. In effect, some programs rely on hardware upgrades to achieve program goals. Procedural change may also require more layers of approval than the straightforward capital project, especially when changes run afoul of collective bargaining agreements. Political expedience may be what causes industry's lingering affinity for capital projects.

A number of administrative challenges emerged in the survey:

- Inconsistent classification of energy improvement measures (WFE). To facilitate coordination with utility rebates and other assistance programs, it is helpful to standardize the classifications used when recording the implementation results recommended improvements (i.e., "projects") as they typically appear in an energy audit report. Also, care should be taken in selecting performance metrics for their clarity, relevance, and reproducibility over time and across multiple facilities.
- Poor data collection by applicants. Program providers often encounter incomplete applications and justifications. This leads to one or more rounds of follow-up contacts. BPA has enlisted a third-party program administrator in part to address this difficulty.
- Onerous application procedures. Some contacts at industrial facilities suggest that energy efficiency programs are beginning to impose an ominous volume of qualification and compliance documentation. Documentation of corporate charters, insurance, labor practices, and other certifications are increasingly required. The sheer volume and complexity of paperwork are problematic enough to discourage some facilities from participating. While such comments are mostly directed toward grants or financing programs, industry may anticipate the same for other assistance programs (Barazotto 2013). The prospective applicant may be jaded by past experience with difficult utility program relationships. This underscores BPA's use of a third party (Cascade Energy) to harmonize administration across programs and to manage the interface with customers.
- Overhead cost administration. Program budgets for fee-based programs should reflect overhead costs. Training and coaching may be among these costs. This requires thoughtful planning of the pricing structure.

- Consistency of enticements. Sometimes, discounts or incentives are used to enroll prospective participants. If offered without coordination across account reps, this may cause some cost accounting problems.
- Qualification of outside hires. Energy experts recruited as a new hire may be subject to qualification by both the provider and the applicant facility. If nothing else, this suggests an opportunity to blend the cost and effort associated with recruitment. While inside hires tend to require more energy-specific training, outside hires require time and mentoring to become well-versed in organizational structure and procedures.
- Industry budget cycles. It is useful to recognize industry's annual budget cycles and to plan program recruitment calendars accordingly.

In total, these observations suggest that challenges to industrial energy efficiency are more organizational than technical. But while the challenges can be surmounted, they will require administrative skills that have not been traditionally found in engineering and maintenance departments. Competent energy management will usually require the placement (or reassignment) of a professional with the requisite skill set.

## Comments and Observations from Participants

At the time of this report's compilation, limited feedback was available from participating facilities. Several isolated anecdotes are:

- Energy manager and energy engineer positions at Simplot (agri-business) were facilitated first by a commitment to the U.S. DOE's Save Energy Now program, ratified by Simplot's CEO and each facility general manager (Hoopes 2012). The energy director's enthusiasm for energy program support reflects the magnitude of the opportunity paired with the ability to improve the triple bottom line of "people, planet, and profit." Prior to the advent of sponsored positions, Simplot staff were fully tasked with production issues; very few people had time to describe the potential for energy reduction, much less implement improvements. Monitoring activities help ensure that energy does not remain "an invisible raw material input." While the pulse on energy use serves efficiency purposes, it also becomes a leading indicator for reliability issues, for example, when the pending failure of a motor drive becomes evident in power consumption trends. Simplot also notes that energy improvements realized as "projects" often do not have durable impacts when they are not complemented with behavioral change. As a result of their sponsored program experience, Simplot is currently retaining and expanding its staff of energy managers and engineers (Sturdevant 2013).
- A Canfor Taylor wood pulp mill in British Columbia reacted to BCH awareness outreach. "Lots of times you do studies and find out what you can do and how much you save, but you can't do anything with it," claims their environmental supervisor. "Finding out BC Hydro was prepared to fund a position inside the mill… was an opportunity to jump into." With existing energy audits and a subsequent energy management assessment, the newly funded energy manager could pursue a sustainable energy management plan. Through today, these efforts enabled the identification of $1.28 million (40 gWh) of annual energy savings (Berger 2013; see website in citation).

- Freybe Gourmet Foods of British Columbia was at first skeptical about energy management. However, early success stories helped to overcome management's fears. Standard practice for project justification at Freybe is to seek the utility's approval for rebates before securing corporate approval for the ensuing project (Vinje 2012).
- Kraft Foods, Kirksville, MO: "I don't see why you wouldn't want to take advantage of (the Missouri Pollution Prevention Intern Program). "You have a student who is doing all of your research for you, showing you a realistic ROI, and presenting their findings to senior staff for you. It's a win/win for all involved." (Steinwachs 2013; see website in citation)

## Innovations and Lessons Learned

The programs studied for this report reveal instructional lessons. This is true for program administrators and participant facilities alike. Until additional research can be conducted, the following is offered:

- An innovation by WFE and BPA allows multiple facilities, related only by proximity, to pool their applications so that they qualify collectively. This strategy makes more sense for a program that emphasizes projects. This approach may be an easy way to foster industry's appetite for energy improvements, boosting small facilities' comfort level needed to commit resources to energy management. It is also a way to encourage service providers to become an energy manager for multiple facilities.
- Another WFE program innovation is its approach to cost sharing. WFE provides 50 percent cost sharing for studies, but does not require a study for projects with a staffing grant application. However, projects are required to have documentation and calculations that show the estimated savings.
- Energy efficiency policies and programs pave the way to better resource and materials management in general. The skills and procedures developed by an energy agenda should be transferrable to other resource areas. In addition, the energy manager can contribute to corporate marketing efforts by applying for awards generated by the U.S. EPA's ENERGY STAR and other authorities. Awareness of these additive benefits may assist in marketing the energy manager program concept.
- Currently, many industrial organizations do not properly anticipate the scope of work for an energy manager, much less the roles and responsibilities commensurate with a formal energy management standard. Program-sponsored energy manager initiatives are an opportunity to develop a cadre of expertise needed to support industry's uptake of strategic energy management. The policy rationale for the onsite energy manager program evolves accordingly. The need for technical competencies remains. But instead of just facilitating energy projects, these programs can become the conduit for developing the leadership needed to cause the adoption of strategic energy management standards. Implicit in this suggestion is the need for skill sets to navigate the communication and coalition-building initiatives that energy managers must practice within their own organizations.

## Conclusions

The concept of energy management—and the energy manager—is still new to most industrial facilities in North America. With unfamiliarity comes a perception of risk. Program sponsorship allows industrial facilities to build energy management competencies with minimal risk of time and resources. While intermittent assistance from outside consultants is helpful, episodic visits of this sort cannot address the organizational change issues that so often stall the implementation of efficiency initiatives. An incrementally more progressive program approach would allow energy program administrators (and their qualified trade allies) to provide facilities with sustained energy optimization support for an interim period, allowing host organizations to achieve initial savings while gaining comfort with the approach. At least in theory, this should reduce the organizational learning curve for establishing a full time, on-site energy manager. Due to insufficient data from the pilot programs studied here, this concept is worthy of future investigation.

Energy managers will play a pivotal role in the adoption of strategic energy management protocols such as ISO 50001 (ISO 2013). The most effective energy managers will be individuals with sufficient gravitas to persuade their colleagues to invest in the effort that such protocols require. While the external marketing of these programs is helpful, industry's acceptance will largely depend on the professional acumen, insight, and motivation embodied in its energy managers.

The pilot programs piloted in this report are varied in their content and approach. Of the five programs studied, three pay the staff cost of energy manager placement. The others ask recipients to pay. There is not yet enough history to proclaim that one format is better than another. The pilot programs demonstrate that applicant facilities should be screened for their ability to accommodate efficiency efforts in general, and for hosting an energy manager in particular. Program administrators often rely on input from utility account managers for this purpose.

The program relationships with facilities are best organized around a contract. In effect, this is a roadmap that establishes goals, accountabilities, and expectations. Since it is impossible for a contract to anticipate all eventualities, a calendar for routine progress reviews is recommended.

Strategic energy management practices will be adopted one company at a time. Frequently, it's not the company that chooses—it is the choice of one or two managers who invest their time in this effort. But to be truly effective, a strategic energy manager effort must engage staff across departmental lines and have top leadership support. Very often, the newly-appointed energy manager will be tasked with creating awareness and support where there currently is none. This suggests that an energy manager should be equipped with the skills of communication and persuasion. Not all organizational stakeholders will be technical people. With money being the common denominator, the energy manager's financial acumen will assist in securing buy-in from diverse departments within an organization.

The viability energy management standards such as ISO 50001—and of energy policy in general—are largely dependent on a visible and supportive constituency. Energy managers can be the constituency for future industrial energy policies, programs, and standards.

Their collective influence grows with their numbers. Onsite energy manager programs are paving the way for the growth of that constituency.

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# Appendix A: Descriptions of Program Providers

## A-1. PROGRAM PROVIDER/ORGANIZER: BC Hydro

Tamara Berger, Program Manager, Industrial Marketing

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| PROGRAM TITLE & CONCEPT | **Strategic Energy Management Program.** BC Hydro (BCH) will partially fund the cost of a full time energy manager dedicated to a participating facility. The energy manager is tasked with implementing a long-term energy management strategy. |
| ELIGIBILE ENTITIES, TYPES OF INDUSTRIES SERVED | Any industrial facility with an annual energy spend of $1,000,000 or more. The program prefers to serve facilities with energy consumption of 20 gWh per year or more. Smaller facilities are not as cost effective for the program. Representative industries include, pulp and paper, wood products, mining, cement, food processing, fisheries, and municipal water plants. |
| NUMBER OF FACILITIES PARTICIPATING | Currently (2013), the program places about 40 energy managers. A few of these individuals cover multiple sites. The usual configuration is one manager per site. |
| INCEPTION & PROGRAM HISTORY | Pilot program originated 2003-03, using consultants as part-time coaches. These individuals tended to be technically knowledgeable, but their part-time status meant they were not fully connected with facility business decisions. The current program format has been in place since 2008, realizing the need for a full-time, dedicated presence with 100 percent commitment to a facility. |
| ANNUAL PROGRAM BUDGET | Seventeen percent of overall industrial program costs, excluding the budget for incentives. Funds are applied to energy manager salaries and related professional training and coaching. These funds also cover monitoring, targeting, and reporting efforts. |
| PROGRAM FUNDING MECHANISM | BCH organizes its outreach agenda and program budget around a "business case" specific to its various customer segments. A business case establishes financial performance targets for energy savings and program costs. The Industrial Energy Manager Program is merely one line item in BCH's industrial business case. BCH pays up to 75% of the energy manager's salary, as follows: 50% to reporting, strategic plan development, workshop planning, |

## A-1. PROGRAM PROVIDER/ORGANIZER: BC Hydro

Tamara Berger, Program Manager, Industrial Marketing

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| | and quarterly reports; another 15% covers behavioral initiatives such as energy awareness events, newsletter communication, lunch & learn sessions, monitoring, and reporting; and the next 10% is devoted to project feasibility and development. The final 25% is paid by the host facility. This breakdown is for compensation, not hours. About half of the hours are on projects. |
| SAVINGS GOALS, TARGETS, MILESTONES, TIME LIMITS | A business case may include some "enabler" items that impose a cost without providing a direct return, such as feasibility studies. The Strategic Energy Manager program is similar. Program performance targets are for a business case in its entirety, not for its component activities. |
| ELIGIBLE ENERGY IMPROVEMENTS | Incentives emphasize upgrades of existing equipment that has not yet reached end-of-life. Eligible applications may vary by industry. Support for new construction is offered, but used as frequently as the retrofit option. |
| ENROLLMENT PROCESS | Participating facilities sign a contract that describes their program duties and deliverables. Senior manager signatures are preferred. Because they enjoy a historical relationship with industrial facilities, BCH's account managers play a key role in prioritizing program applicants, based on the account manager's knowledge of the facilities' past performance. Account managers also steward the application process. |
| SCOPE OF WORK, EXPECTATIONS | Contracts attempt to establish a work plan with accountabilities and protocols for progress reviews. |
| CURRENT STATUS | The program is still relatively new. The current challenge is to ensure that the balance of staff at participating facilities are aware of and can support the energy management effort. Energy competes with safety, quality and other agendas for attention. The program has not yet created demand for self-sustaining energy manager positions. A few facilities have opted to leave the program because they either cannot find an improvement opportunity or because they cannot commit to the program deliverables now that participation demands strategic energy planning, as opposed to simply pursuing capital projects. The learning curve for facilities is slow—perhaps |

## A-1. PROGRAM PROVIDER/ORGANIZER: BC Hydro

Tamara Berger, Program Manager, Industrial Marketing

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| | 10 years. |
| ALIGNMENT BETWEEN FACILITY & PROVIDER AGENDAS | Achieved primarily through contract language. |
| CAPITAL PROJECTS APPROACH | Capital project implementation is the culmination of rigorous energy auditing and feasibility analysis. Note that a project-focused program approach was offered until cancelled in April 2013 in favor of the strategic energy manager approach. |
| NON-CAPITAL MEASURES APPROACH | Non-capital changes to process work usually require senior management approval. Union rules are often a factor when implementing change. |
| MONITORING, REPORTING, VERIFICATION | A typical metric is cumulative summation of change in energy consumption, or "Q-sum." This is the cumulative total of monthly deviations in consumption as it varies from a pre-improvement baseline. Baselines are usually determined by a consultant who performs a site assessment as well as feasibility for targeted capital projects. |
| IMPACTS | n.a. (too new) |
| LESSONS LEARNED | Senior management support is crucial, but difficult to get up front. Their buy-in becomes easier after some initial results are available. By late 2013, the BPA program will integrate senior management deliverables into its support contracts. Good contract language is helpful from the inception to shape the energy manager engagement. Screening prospective participants is a continual learning process. Some facilities already have an efficient culture, so they are immediately more amenable to having an energy manager. In other cases, the energy manager will be tasked with boosting efficiency awareness, thus paving the way for implementation of improvements. |

## *A-2. PROGRAM PROVIDER/ORGANIZER: BONNEVILLE POWER ADMINISTRATION (BPA)*

Todd Amundson, Energy Management Engineer

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| PROGRAM TITLE | Energy Smart Industrial Partner – Energy Project Manager Co-Funding. The program goal is to increase end user management and engineering efforts devoted to electrical energy projects/activities and increase the implementation of industrial energy efficiency measures. The enabling policy for this program are the 1980 Northwest Power Act and the subsequent Northwest Power and Conservation Council, which collectively allow for regional energy planning, including efficiency and conservation gains. These plans anticipate that up to one third of industrial sector power savings can be obtained through energy management. |
| ELIGIBILE ENTITIES, TYPES OF INDUSTRIES SERVED | Eligible entities are those with a three MW average power load or greater. Guidelines are flexible, however, as applicants are also considered for their past performance in previous energy programs. Participants are typical of the region: pulp and paper, food processing, aircraft manufacturing, waste water treatment, primary metal production. |
| NUMBER OF FACILITIES PARTICIPATING | This program has placed 28 energy managers since 2009. There is no stipulated maximum. Forty sites currently participate. At least six managers are responsible for multiple sites. |
| INCEPTION | This program began with a 2006 pilot effort that served the Grays Harbor non-integrated paper mill. The relationship was facilitated by the fact that plant engineers there had been working with Grays Harbor PUD (municipal utility) and BPA program staff. With energy improvement proposals not getting sufficient support, BPA decided to test the energy champion concept at this facility in partnership with NEEA and Grays Harbor PUD. Initial pilot efforts simply covered technical support and feasibility studies for capital projects. The scope expanded to provide a third-party energy manager to develop key performance indicators and manage energy projects. Full time funding support for this energy manager came by 2008. The success of the pilot led to replication as a program offering. |
| ANNUAL BUDGET | The energy manager co-funding activity is a component of BPA's overall Energy Smart Industrial (ESI) program. The |

### *A-2. PROGRAM PROVIDER/ORGANIZER: BONNEVILLE POWER ADMINISTRATION (BPA)*

Todd Amundson, Energy Management Engineer

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| | ESI program provides administrative flexibility to move funds between allied activities, so there is no funding cap on any one activity. |
| PROGRAM FUNDING MECHANISM | Currently, BPA disburses funds to its member utilities, which then apply funds though their programs in rate periods, currently at two consecutive fiscal years. |
| SAVINGS GOALS, TARGETS, MILESTONES, TIME LIMITS | The program goal is to reduce participating facility energy consumption. The minimum goal is one million kWh annually. While the primary focus is on electricity, evaluations will also recognize water and fossil fuel savings. Contracts are subject to annual renewal, with negotiable extensions if conditions warrant. About half of current contracts have 12-18 month terms. |
| ENROLLMENT PROCESS | To implement the program, a third-party vendor works with BPA's member utilities to promote the program to industrial consumers. The vendor also helps to select prospective participants and to guide them through the application process. |
| SCOPE OF WORK, EXPECTATIONS | Program dollars are applied at a rate of $0.025 per kWh saved, up to the energy manager's fully loaded salary, not to exceed $250,000 per year per facility. Any costs beyond this cap are paid by the participant. |
| INTEGRATION WITH HOST ORGANIZATION | In most cases, the program pays the facility to reassign an existing employee to an energy focus. This can be a new employee or contractor, as needed. Energy managers are chosen for their practical experience. |
| ALIGNMENT BETWEEN FACILITY & PROVIDER AGENDAS | Very often there are implementation issues not anticipated in the scope of the contract. The periodic program milestone review meetings help with resolving these issues. |
| CAPITAL PROJECTS APPROACH | The program seeks to identify and facilitate any improvements that reduce energy waste and/or boost productivity. These improvements are evaluated with cost-benefit ratios. |
| NON-CAPITAL MEASURES | While the emphasis is on capital projects, the program does |

## *A-2. PROGRAM PROVIDER/ORGANIZER: BONNEVILLE POWER ADMINISTRATION (BPA)*

Todd Amundson, Energy Management Engineer

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| APPROACH | support behavioral initiative where feasible. BPA organizes non-capital assistance for the industrial sector primarily through two programs. CO-funded energy managers have access to these program resources. They include (1) the Track and Tune program, which pays incentives based on actual energy reductions achieved through a continuous improvement discipline of energy metering and monitoring; and (2) the High Performance Energy Management program, which builds on the Track and Tune principle by integrating organization-focused Lean and Six Sigma disciplines. |
| MONITORING, REPORTING, VERIFICATION | M&V for capital projects follow BPA M&V protocols, which adhere to IPMVP. Energy improvement projects proposed under program auspices are subject to BPA approval prior to implementation. BPA program administrators perform participant evaluations approximately every three months. For ESI behavioral projects, performance monitoring, targeting and reporting will continue for 3-5 years in accordance to ESI MT&R guidelines that adhere to IPMVP. Evaluation is based on whole facility consumption (IPMVP Option C) as opposed to isolated application monitoring (IPMVP Options A and B). |
| IMPACTS | Capacity savings averaging 16.6 MW have been implemented through March 2013. Over 50% of program participants apply for term renewals. Some facilities are currently in years 2-3 of their participation. In some cases, those that don't renew feel they've done all they can by pursuing a fixed number of projects (they don't perceive energy management as a continuous improvement activity). |
| LESSONS LEARNED | Program administration can be challenging when funding and administration varies by jurisdiction, when activities are coordinated for companies that operate facilities in multiple jurisdictions.<br><br>Considering that there are dozens of energy manager pilot program participants for engagement s of 12 to 18 months, and longer; well thought out program contact language is invaluable from the inception for the offerings to be successful, and create an allowance for biannual revisions as needs arise, as they often do. |

## *A-3. PROGRAM PROVIDER/ORGANIZER: DETROIT EDISON (DTE)*

Ken Randazzo, Manager

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| PROGRAM TITLE | Energy Partnership & Services.<br><br>This DTE initiative places energy managers in customer facilities as a fee-based engagement, with a scope dedicated to implementing energy improvements. The purpose is also to accelerate the customer's uptake of utility incentives and rebates—activities that might otherwise be forfeited due to the customer's lack of time and ability. |
| ELIGIBILE ENTITIES, TYPES OF INDUSTRIES SERVED | All customers are eligible, but the "ideal" is a facility with a large annual energy spend. An ideal customer is also one with multiple sites, which may provide economies of scale through replication. The program's priority is to examine electricity savings, but will also consider gas, and steam applications. School and hospital facilities are also a sector of interest. |
| NUMBER OF FACILITIES PARTICIPATING | A total of ten facilities have been served by this program. Five are currently enrolled. Most are industrial. |
| INCEPTION | Program has a 20-year history. The recent economic recession has actually been good for driving customer interest in this service. More customers realize that in this economy, energy emerges as one of the few controllable costs. |
| ANNUAL BUDGET | Currently about $2 million. |
| PROGRAM FUNDING MECHANISM | The program's annual budget is funded primarily through customer fees. Fees are generated through an annual contract that defines the energy manager's scope of work. Some back office costs are allowable ratepayer expenses. |
| SAVINGS GOALS, TARGETS, MILESTONES, TIME LIMITS | This program helps DTE to meet its regulatory saving targets. The program also intends to make revenue for DTE through fees charged to customers. The current annual goals are (1) to optimize customer use of DTE's energy efficiency incentives, and (2) generate $400,000 revenue per energy manager. |
| CREDIT FOR IMPLEMENTATION | "Success" for this program has historically meant generating fee income. The renewal of annual contracts is an equally important goal. Accordingly, this program has no concerns about free ridership (the risk of incenting |

## *A-3. PROGRAM PROVIDER/ORGANIZER: DETROIT EDISON (DTE)*

Ken Randazzo, Manager

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| | implementation that would have happened on its own). |
| ENROLLMENT PROCESS | DTE's key account managers connect their customers with this program. Contracts are for one or two year's duration, with a 30-day out clause. The key account managers' knowledge of potential participants is crucial for eligibility screening—eligibility is in many ways a subjective evaluation. |
| SCOPE OF WORK, EXPECTATIONS | The energy manager performs project identification and feasibility analysis. The energy manager looks at equipment upgrades, new construction, and replacement repair. Studies generate project cost estimates and simple payback. The customer may generate additional analysis. The DTE energy manager may also provide grant writing and ENERGY STAR recognition applications. |
| INTEGRATION WITH HOST ORGANIZATION | Staffing varies with the facility: while all energy managers are "outside hires" to the facility, some are DTE employees while others are contractors. |
| ALIGNMENT BETWEEN FACILITY & PROVIDER AGENDAS | Contracts happen because someone at the customer facility wants it to happen. Multi-site facilities may not have buy-in across all facilities. It falls to the energy manager, plus the customer's point of contact, to build the relationships to get buy-in. |
| CAPITAL PROJECTS APPROACH | Note that DTE's service is not to be confused with performance contracting. There are no performance guarantees, nor is compensation tied to performance. The contracts are simply subject to annual renewal at the customer's discretion. |
| NON-CAPITAL MEASURES APPROACH | While the emphasis is on capital projects, the program does consider behavioral initiatives where feasible. |
| MONITORING, REPORTING, VERIFICATION | Because of the business model for this program, performance evaluation has historically focused on accounting labor hours, not energy savings. Only recently has it begun to tabulate implementation rates. |
| IMPACTS | Past implementation rates are unknown, since the historical goal was to generate fees. Efforts are underway to track customers' implementation of energy manager |

### *A-3. PROGRAM PROVIDER/ORGANIZER: DETROIT EDISON (DTE)*

Ken Randazzo, Manager

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| | recommendation. |
| LESSONS LEARNED | Coordinate more on what shall be given away for free to jump-start the program. Develop a business plan for growing the business. Avoid blending the roles of supervisors with the actual energy manager program work, as this creates problems with cost assignment. |

## *A-4. PROGRAM PROVIDER/ORGANIZER: WISCONSIN FOCUS ON ENERGY (WFE)*

via John Nicol, Industrial Program Manager & Senior Engineer, Science Applications International Corporation

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| PROGRAM TITLE | Staffing Grant. These grants cover the first-year cost of hiring a professional to oversee the implementation of existing energy-efficiency and renewable energy project recommendations. Energy managers also facilitate the capture of rebates and incentives. Staff can be new hires, re-purposed staff, or consultants. |
| ELIGIBILE ENTITIES, TYPES OF INDUSTRIES SERVED | These staffing grants help businesses, manufacturers, schools, and government facilities throughout Wisconsin. Eligible facilities are those with power capacity in excess of one MW, or those with a peak monthly energy spend in excess of $60,000. The applicant must have already documented their potential energy efficiency projects. The potential savings value must be in excess of the grant amount. A single grant cannot be more than 40 percent of annual predicted savings. |
| NUMBER OF FACILITIES PARTICIPATING | An average of seven to eight facilities have received grants each year since the program inception. To date, 28 facilities have been served. |
| INCEPTION | This program dates back to 2009, starting with the pulp & paper industry. Other industries are now eligible. |
| ANNUAL BUDGET | Budget is part of incentive budget. Draw is flexible, varies with quality of proposals. Annual appropriations are approx. $500,000 to $750,000. |
| PROGRAM FUNDING MECHANISM | Funding is through ratepayer public benefit charges. The maximum staffing grant for industrial is $80,000. Commercial businesses, schools, and governments are eligible to apply for up to $40,000. Average grant requests are for $50,000 - $60,000. Funding for the staffing grants is based on the energy savings from these projects. |
| SAVINGS GOALS, TARGETS, MILESTONES, TIME LIMITS | These grants are of limited duration—allowing the pursuit of documented improvement recommendations that would not be possible with existing staff capacity. Applications are scored on a scale of 100, with subtotals for cost effectiveness (40), need for support (25), staff qualifications (20), quality of feasibility studies (10), and likeliness of on-time performance (5). First-time applicants are eligible for |

### *A-4. PROGRAM PROVIDER/ORGANIZER: WISCONSIN FOCUS ON ENERGY (WFE)*

via John Nicol, Industrial Program Manager & Senior Engineer, Science Applications International Corporation

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| | 10 bonus points. |
| CREDIT FOR IMPLEMENTATION | Grants are paid out as individual projects are completed. Participants absorb the risk of any costs that exceed the stipulated grant amount. |
| ENROLLMENT PROCESS | Applicants pursue a formal RFP application process. Grants can be used to cover the salary and benefits of a full- or part-time employee or consultant. Partnering or neighboring companies are encouraged to submit a joint application and share an employee or consultant between the businesses. |
| SCOPE OF WORK, EXPECTATIONS | When applying for a staffing grant, businesses must include a list of potential energy-saving projects. Applicants must also clearly articulate the current implementation constraints. |
| INTEGRATION WITH HOST ORGANIZATION | In most cases, the appointed energy manager is an existing staff person, which greatly reduces start-up issues. The staff person tabbed for the energy position is also the one tasked with grant application. There's always satisfaction in securing extra revenue. |
| ALIGNMENT BETWEEN FACILITY & PROVIDER AGENDAS | The application requires clear documentation of the point of contact and chain of command pertinent to the energy manager. |
| CAPITAL PROJECTS APPROACH | Participating companies are required to document discrete projects as a precondition to winning a staffing grant. |
| NON-CAPITAL MEASURES APPROACH | The program's emphasis is on discrete project implementation. Operational change initiatives are occasionally supported. Some low- or no-cost options are suggested by program administrators. From a policy and program perspective, persistence is a concern. |
| MONITORING, REPORTING, VERIFICATION | Utility incentive programs require pre- and post-implementation inspections, achieved through random sampling. Also, applicants are required to submit feasibility studies refined to +/- 10 percent savings estimates. Ultimately, implementation rates are self-reported by facilities and through project invoices to |

## *A-4. PROGRAM PROVIDER/ORGANIZER: WISCONSIN FOCUS ON ENERGY (WFE)*

via John Nicol, Industrial Program Manager & Senior Engineer, Science Applications International Corporation

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| | program administrators, but verified with onsite inspections for larger projects. Metering is too costly. Many improvement opportunities can be met with prescriptive measures, which eliminate the need for investment analysis. |
| IMPACTS | Program administrators shared data for 2010 results only for this report. During that year, staffing grants were awarded to eight facilities. Of these, seven were able to implement at least some of their proposed improvements. Results for those seven facilities are summarized as follows:<br><br>Number of projects completed by seven award recipients; while all projects were facilitated by the staffing grant, the energy savings totals include some projects that were not eligible for additional investment incentives:<br>• Total: 35<br>• Average per recipient: 5<br>• Range over seven award recipients: 1 - 9<br><br>Energy savings implemented by seven award recipients:<br>• Total: 278,872 MMBtu<br>• Average per recipient: 54,823 MMBtu<br>• Range over seven award recipients: 5,486 – 86,653 MMBtu<br><br>Staffing grant expenditure value per MMBtu saved; note that specific project investment incentives were additional:<br>• Average, all award recipients: $0.91<br>• Range over all award recipients: $0.30-$9.39 |
| LESSONS LEARNED | Many facilities are aware of potential energy savings, but feel that it's not worth diverting time and attention away from core business activities. Having a staff person dedicated to energy allows a facility to sustain an energy agenda that would otherwise not develop.<br><br>Organize grant offerings with an application deadline as opposed to rolling admissions. Recognize industry's prevailing budget cycles, and time the RFP process accordingly. This usually means receiving applications in July in anticipation of a January start. Coordination is an issue: the codification of project types can be inconsistent |

### *A-4. PROGRAM PROVIDER/ORGANIZER: WISCONSIN FOCUS ON ENERGY (WFE)*

via John Nicol, Industrial Program Manager & Senior Engineer, Science Applications International Corporation

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| | across programs. Many applications lack sufficient detail and require administrator follow-up. |

### *A-5. PROGRAM PROVIDER/ORGANIZER: U.S. EPA, UNIVERSITY OF MISSOURI ENVIRONMENTAL ASSISTANCE CENTER.*

Marie Steinwachs, Director

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| PROGRAM TITLE | Missouri Pollution Prevention Intern Program.<br><br>The program places upper-level engineering students at large facilities for summer engagements. The interns offer affordable expertise to help facilities reduce energy and hazardous materials, cut waste, conserve water, and save money. Similar programs are in AZ, CA, CO, DC, FL, GA, IL, IA, KS, MD, MA, MI, MN, MT, NE, NH, ND, OH, PA, TN, TX, and WI. |
| ELIGIBILE ENTITIES, TYPES OF INDUSTRIES SERVED | Industrial, institutional, municipal and water treatment facilities have been served by this program. Participating companies include ABB, AT&T, Boeing, Cargill and Kraft. |
| NUMBER OF FACILITIES PARTICIPATING | The program serves from two to 10 facilities per year. |
| INCEPTION | Since its inception in 2008, 23 interns have participated in the program. |
| ANNUAL BUDGET | The Missouri program budget is $160,000 to $260,000 per year, provided by EPA grants, university matched services, and program income. Intern salaries paid by facilities are reflected as a budget match. |
| PROGRAM FUNDING MECHANISM | Participating facilities pay the interns a minimum of $15 per hour, with no benefits, unless a facility's human resource policy allows for any additional accommodation. |
| SAVINGS GOALS, TARGETS, MILESTONES, TIME LIMITS | Participating facilities are not obligated to achieve any specific reduction measures. This program merely helps to find, measure, evaluate and document potential improvements. Interns' summer engagements are for 10-11 weeks, typically from late May to mid August. |
| CREDIT FOR IMPLEMENTATION | n.a. The host facility is free to implement or dismiss the intern's recommendations. However, the program recognizes only implemented measures when accounting program results. |
| ENROLLMENT PROCESS | Participating companies must show that they have an improvement agenda, or at least can describe the outcomes they want. Students can apply to the intern program after |

### *A-5. PROGRAM PROVIDER/ORGANIZER: U.S. EPA, UNIVERSITY OF MISSOURI ENVIRONMENTAL ASSISTANCE CENTER.*

Marie Steinwachs, Director

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| | fulfilling course requirements including energy efficiency, pollution control measures, and cost analysis. The program administrator screens the applicants for professional and academic experiences, attempting to match them with companies for activities that meet the student's interests. The program administrator's matching effort includes a visit to the facility. Interns must also pass through the host facility's hiring process. |
| SCOPE OF WORK, EXPECTATIONS | Students are tasked with actual project design and implementation activities. They complete feasibility studies and make improvement recommendations. |
| INTEGRATION WITH HOST ORGANIZATION | The quality assurance plan spells out the intern's chain of command, points of contact, and data collection and assurance responsibilities. The host is required to provide the intern with a computer, phone, data access, and vendor access. |
| ALIGNMENT BETWEEN FACILITY & PROVIDER AGENDAS | A quality assurance project plan (QAPP) serves as a roadmap for coordinating the expectations of the intern, the host facility, and the program administrator. |
| CAPITAL PROJECTS APPROACH | The intern's mandate is to identify and scope discrete projects for potential implementation. |
| NON-CAPITAL MEASURES APPROACH | While the program emphasis is on capital projects, behavioral and administrative measures can also be examined. |
| MONITORING, REPORTING, VERIFICATION | Participating companies are not responsible for reporting their implementation efforts, but they do respond to periodical follow-up calls from the program administrator. A study by a similar program in Nebraska finds that savings results are better than originally estimated. |
| IMPACTS | From its inception, the program has identified potential improvements worth over $1.04 million in annual savings. This includes 13.7 million gallons of water and five million kWh of electricity savings. |
| LESSONS LEARNED | Ensure that the intern salaries include an overhead premium to cover program administration costs. Partner |

### *A-5. PROGRAM PROVIDER/ORGANIZER: U.S. EPA, UNIVERSITY OF MISSOURI ENVIRONMENTAL ASSISTANCE CENTER.*

Marie Steinwachs, Director

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| | with utilities to organize data for energy performance monitoring and verification purposes. Difficult to restore program fees if these are initially discounted to attract first participants. |