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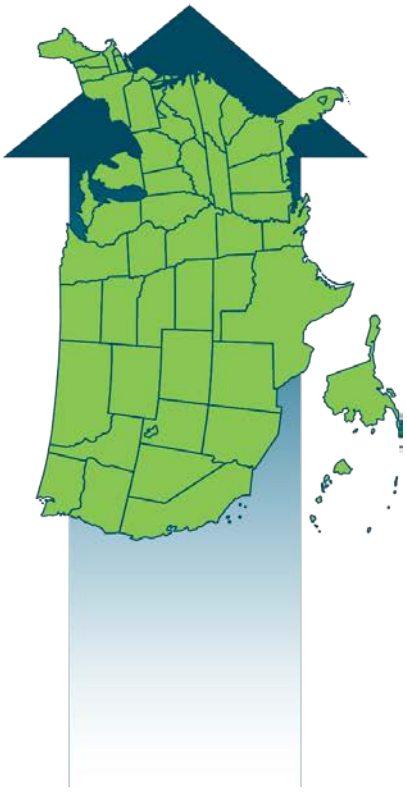

Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector

Executive Summary

Industrial Energy Efficiency and Combined Heat and Power Working Group

March 2014

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Executive Summary

Industry[1] is a key energy-using sector in the United States and accounted for about one-third of the nation's total primary energy consumption in 2012. In addition, the potential cost-effective energy savings in U.S industry is large—amounting to approximately 6,420 trillion British thermal units of primary energy (including combined heat and power), according to a comprehensive 2009 analysis by McKinsey & Company. In the United States, efforts to capture more of the potential energy savings in industry at the state level have grown in recent years as energy efficiency programs that capture cost-effective savings continue to be created and expand.

This report provides state regulators, utilities, and other program administrators an overview of the spectrum of U.S. industrial energy efficiency (IEE) programs[2] delivered by a variety of entities including utilities and program administrators. The report also assesses some of the key features of programs that have helped lead to success in generating increased energy savings and identifies new emerging directions in programs that might benefit from additional research and cross-discussion to promote adoption.

Why Do States Undertake Industrial Energy Efficiency Programs?

Many states have instituted energy efficiency programs funded by the public or ratepayers to achieve a variety of benefits. A core, compelling reason for this is because energy efficiency represents a least-cost option for supplying energy services compared to other prevailing options, providing both consumers and society with cost savings. Additional benefits can include environmental gains (including carbon or water use reduction), improved security against energy supply disruption or rapid price increases, and enhanced economic competitiveness. Most state governments have determined that it is necessary to include programs that cover all customers as part of their overall energy efficiency efforts, with industrial customers often a critical component. Experience has shown that the industrial sector historically saves more energy per program dollar than other customer classes: at the national level, IEE programs had an average cost of saved energy of $0.030 per kilowatt hour (kWh) in 2012—nearly one cent lower than the aggregate average energy efficiency program cost of $0.038/kWh.[3] Many of the well-established ratepayer-funded IEE programs in North America, such as those of Bonneville Power Authority, BC Hydro, Energy Trust of Oregon, or Wisconsin's Focus on Energy, continue to realize reliable energy savings from industry at or below the average costs they face for their programs overall. To realize these low-cost energy savings, however, requires a concerted effort developed specifically for the industrial sector and long-term, focused efforts addressing specific industrial needs and circumstances.

States have found that a larger amount of energy savings potential in industry can be gained from energy efficiency programs than can likely be achieved if industrial energy users pursue energy efficiency individually, with limited program assistance. Industrial companies are often aware of energy savings projects in their facilities and many companies have a solid record of developing these projects to save money; however, energy efficiency often cannot compete with other capital demands, even with similar or better paybacks. Moreover, industrial staff members often report that it is difficult to effectively navigate corporate project decision-making systems to get management endorsement for even quick payback energy efficiency projects. In addition, small- or medium-sized energy savings projects often do not compete well with other projects in garnering management attention and

[1] As defined by the Energy Information Administration (EIA), industry consists of the following types of activity: manufacturing (NAICS codes 31-33); agriculture, forestry, fishing, and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). This report principally focuses on the manufacturing subsector.

[2] The best practices information presented in this report is based on a review of publically available literature on state energy efficiency programs and materials and presentations from related workshops and discussions with industrial energy efficiency experts and program administrators, including: the ACEEE Summer Study on Industry (July 2013, Niagara Falls), the ACEEE Resource Acquisition Conference (September 2013, Nashville), the Industrial Energy Efficiency and CHP Regional Dialogue Meetings (held in 2011, 2012 and 2013), the Midwestern Governor's Association Industrial Energy Productivity Meeting (November 2013, Chicago).

[3] Source: Aden et al. 2013 based on EIA 2012 demand-side management, energy efficiency, and load management programs data for more than 1,000 utilities. Note: To ensure consistency and comparability, these values only include the 182 organizations that reported residential, commercial, and industrial savings and expenditure data; transport sector energy efficiency program data are not included except as a component of the aggregate average.

enthusiasm. Finally, limitations on staff resources and knowhow can further hinder implementation of cost-effective energy efficiency measures.[4]

In states where ratepayer-funded energy efficiency programs are in place, industrial programs can make a significant difference, not only by fostering higher implementation of quick payback projects, but also by providing financial incentives that improve the economics of what would have been longer-term payback projects (3–6 years) that are well outside the typical interest scope of industrial managers. Program incentives to help industrial customers capture the potential for large, additional energy savings can strengthen the alignment of company incentives with the broader interests of energy users statewide in developing low-cost resources for energy service supply. In addition, other intensive but highly cost-effective initiatives of key medium-term interest can be fostered through multi-year programming, such as development of new strategic energy management (SEM) systems in industrial companies.

Even relatively simple programs providing technical assistance, fostering peer exchange, and disseminating practical information can make a difference by supporting facility or company energy management staff in their work and drawing company management attention to energy cost saving possibilities. Increasing awareness of the non-energy benefits (NEBs) that often accompany energy saving projects can help tip the scale in favor of project implementation.

The Wide Spectrum of Ongoing and Useful State Programs

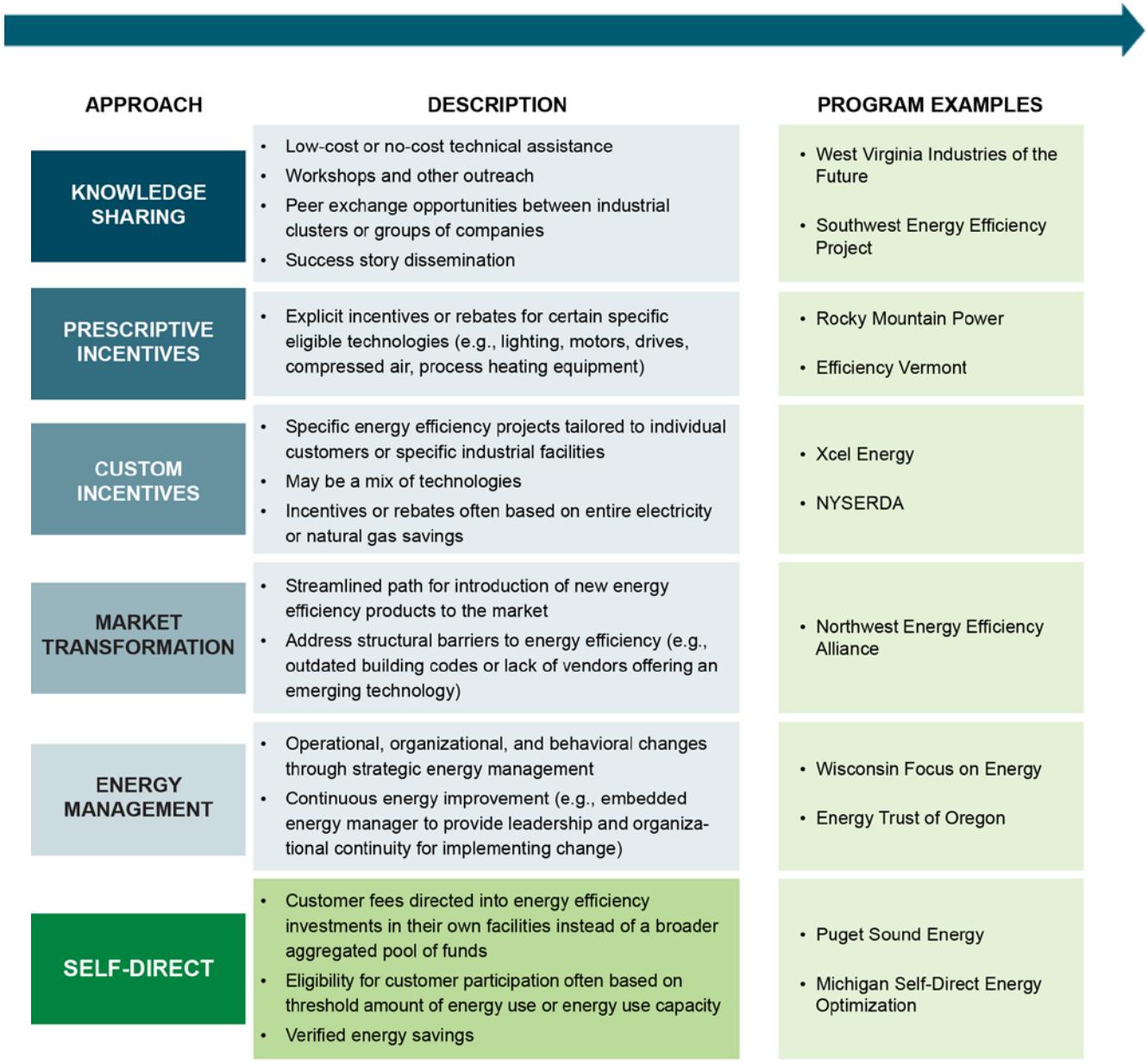
There is wide variation in the types of IEE programs pursued by states, utilities, and energy efficiency program administrators. The dynamics of local economies, existing regulatory frameworks, political interest, and characteristics of local industrial sectors help define what different states feel are the most appropriate approaches for IEE programs. Within this wide spectrum of successful—if diverse—experience, all states can certainly launch new programs, or adapt existing programs, providing cost-saving benefits to industry and the state at large. Moreover, because of the diversity of programs and experience, each state can learn from others about new ideas and lessons learned in program design and implementation.

This report defines a state IEE program in broad terms as a program that provides information, services, and/or financial support to interested industrial facilities within the state for energy efficiency activities. Broadly speaking, there are two main types of IEE programs in the United States:

- Ratepayer-funded energy efficiency programs which are funded through electric and gas customer rates
- Non-ratepayer-funded programs, which are funded by other means (e.g., federal resources, state operating budgets) and are often run by out-of-state energy offices and universities.

This report principally focuses on ratepayer-funded programs, although non-ratepayer-funded programs are also touched upon. Many states also mix a variety of different offerings and funding streams. The National Association of State Energy Officials (NASEO) reports that at least 35 state energy offices operate some type of IEE program separate from, or in support of, ratepayer-funded programs. Forty-one states have ratepayer-funded energy efficiency programs, and just over one-half of states operate ratepayer-funded programs with clean energy portfolio standards/energy efficiency resource standards or utility energy efficiency targets. Some states have chosen to include a self-direct or opt-out option to industrial programs. Self-direct programs are defined in this report as programs that allow qualifying industrial customers to "self-direct" fees that would normally be charged for a ratepayer-funded program directly into energy efficiency investments in their own facilities instead of into a broader aggregated pool of funds collected through a public benefits charge for energy efficiency programs. Not to be confused with "opting out," where the industrial company does not have to participate in the program, self-directed industrial customers are still obligated to spend money and deliver energy savings, either on a project-by-project basis, or over a certain amount of time.

[4] These IEE program challenges were identified through SEE Action Industrial Energy Efficiency and Combined Heat and Power Regional Dialogue Meetings held across the country in 2011, 2012, and 2013 (www1.eere.energy.gov/seeaction/ieechp_dialogues.html).



Source: Categorization adapted from Bradbury et al. (2013)

Figure ES-1. Spectrum of IEE state program approaches with program examples

Financial incentives and technical assistance are often provided to energy users to implement sufficient energy efficiency measures to meet specific statewide energy savings goals or pursue all cost-effective energy efficiency opportunities. The main types of offerings, shown in Figure ES-1, are the following:

- **Technical Assistance and Knowledge-Sharing Programs.** These programs typically offer no-cost or low-cost expertise and advice to industrial companies on new technologies and practices, share analytical tools, disseminate success stories and case studies, and offer networking opportunities.
- **Prescriptive Programs.** Standardized prescriptive program offerings provide explicit incentives for adoption of specified higher-efficiency technologies in applications that are common among a variety of commercial and industrial energy users.
- **Custom Programs.** These program offerings provide financial and technical support, usually for customized, often process-specific, project implementation designed to meet the explicit needs of specific industrial customers. They can unlock substantial energy savings beyond what is possible when targeting only individual pieces of equipment and are usually quite cost-effective.

- **Market Transformation Programs.** These programs aim to streamline the path from market introduction of new energy efficiency products or practices to their promotion and consumer acceptance. Adoption of the new products can be supported through increasingly stringent energy efficiency codes and standards, technical assistance, and/or financial incentives.
- **Strategic Energy Management and Energy Manager Support Programs.** Rather than focusing on technology and equipment, these programs seek to promote operational, organizational, and behavioral changes resulting in energy efficiency gains on a continuing basis. SEM involves the operation of internal cross-organization management systems for companies that need to identify and implement many energy efficiency measures year after year.

Experience from Designing and Delivering Programs

A central finding of this report is that achieving success in IEE programs requires significant upfront investment and steady commitment over a number of years. In practice, the experience of strong IEE programs shows that the dedicated effort required is worth it in terms of generating robust and low-cost energy savings. This is especially true in the industrial sector where energy improvement decisions may be linked to operational or capital cycles.

The industrial sector is heterogeneous; different plants have different needs, all of which takes time and skill to grasp. Industrial plant staff members are generally more sophisticated concerning energy matters compared to residential and many commercial energy users. However, internal decision-making processes in industrial companies concerning energy efficiency investments or energy use behavioral change can be complex. Plant operational cycles must be understood and typically define project scheduling. Often, non-energy benefits, including increased productivity, may provide a key tipping point benefit in favor of pursuing a given line of projects, but such benefits may not be immediately obvious. As detailed further in Chapter 4, the barriers and challenges of the industrial sector must be addressed if IEE programs are to create real value for their customers.

To overcome existing barriers and provide high value to industrial customers, programs require quality market assessments, steady and close interaction with customers, a critical mass of knowledgeable staff and strategically engaged consultants, and operational stability. This requires upfront investment and a multi-year focus.

There are 10 IEE program features highlighted by analysts and practitioners that consistently add value to industrial customers and contribute to program success. These program features are:

1. **Clearly demonstrating the value proposition of IEE projects to companies.**
   There are many direct and indirect benefits from IEE projects. A key point in making the value proposition case to industrial company managers is to lay out in simple and concise terms the operating cost savings and other benefits—including profits—that are being left on the table by not addressing cost-effective energy efficiency improvement opportunities.
2. **Developing long-term relationships with industrial customers that include continual joint efforts to identify IEE projects.** Maintaining relationships with key industrial customers is important in pure technical assistance programs as well as energy efficiency resource acquisition programs. It takes time and a steady relationship for program personnel to understand company circumstances and needs, and for company personnel to understand what a program can offer them. Projects tend to be identified over time, as circumstances change and opportunities arise.

   Maintaining quality long-term relationships is people-dependent. Most programs have found that it is necessary to have a consistent and savvy contact person for industrial customers to interact with, such as an account manager. Satisfaction of industrial customers with program delivery and results often hinges on the level of trust established in relationships with program staff or experts.

   Due to the importance of long-term relationships, substantial program investments in staffing or contracted expert capacity are necessary over a number of years to generate the best results. Contracting for program delivery capacity based on only short-term goals, with frequent changes in contractors, is not likely to succeed. Time and effort is needed to set up effective institutional systems.

3. **Ensuring program administrators have industrial sector credibility and offer quality technical expertise.** Effective IEE programs also develop credibility with the industrial customer by employing staff and/or contracted experts that understand the customer's industrial segment and have the technical expertise to provide quality technical advice and support on energy efficiency options and implementation issues specific to that industry and customer. Addressing industrial companies' core needs requires understanding a plant's production processes, operating issues, and the market context that it operates within. Effective IEE programs will adopt the language, engagement strategies, and metrics that are meaningful to the corporate managers who drive capital investment decisions. Understanding customer needs and their investment decision-making processes allows IEE program administrators to generate trust with their industrial customers, boosting IEE implementation rates while making better use of limited resources.
4. **Offering a combination of prescriptive and custom options to best support diverse customer needs.** A combination of both prescriptive offerings for common cross-cutting technologies and customized project offerings for more unique projects can best meet diverse customer needs and provide flexible choices to industries.
5. **Accommodating scheduling concerns.** Program flexibility to meet industry project scheduling requirements is important to meet industrial customer needs. Typically, scheduling of capital project implementation must consider both operational schedules that dictate when production lines may be taken out of operation and capital investment cycles and decision-making processes. Programs with multi-year operational planning can best accommodate company scheduling requirements and the ebb and flow of company project implementation progress.
6. **Streamlining and expediting application processes.** Industrial customers may perceive the application and implementation procedures for IEE programs to be administratively complex and burdensome. Achieving the right balance between meeting key program administration needs for information and keeping program procedures simple and efficient may often require a continual process of evaluation and improvement.
7. **Conducting continual and targeted program outreach.** Even where industrial programs are well established, various industrial customers may remain unaware of the industrial program offerings that may be most applicable or useful for them due to staff turnover and internal demands. Steady and continual outreach and dissemination of information, such as examples of successful past projects, is important to encourage participation. Effective long-term relationships with industrial customers create better information flow and can assist in program outreach efforts.
8. **Leveraging partnerships.** Successful IEE programs often partner with federal, state, and regional agencies and organizations to leverage their expertise, access to customers, and program implementation support capacities. Partnerships can help programs by providing technical expertise, program design and implementation guidance, and expanding program outreach and implementation channels.
9. **Setting medium- to long-term goals as an investment signal for industrial customers.** Most state IEE programs have found that establishing and reporting on energy savings goals in three-year cycles is effective. Medium- and longer-term goals and coordinated funding cycles set a framework for long-term programming and can signal increased certainty to the market and program administrators.
10. **Undertaking proper project measurement and verification and completing program evaluations.** Effective measurement and verification (M&V) of project energy savings is critical to program administrators and regulators to assess the actual results of program activities and measure the contribution of projects and aggregate programs for achieving their goals. Manufacturers also can obtain clear views of the results of investment. Planning for M&V during the program design phase as well as periodic evaluation and adjustment in M&V approaches is important. If NEBs can be included in project assessments, they can further improve understanding of these often important benefits in conveying the value proposition for future energy efficiency projects. Finally, it is useful for programs to undertake periodic process and/or operational strategy evaluations of their full range of activities to assess where program efficiency and results can be further improved.

Self-Direct Programs

This report's review of self-directed IEE programs found a wide range in program structures. Some programs leave obligations of self-directed industries only vaguely defined, include little reporting, and little or no monitoring of energy-saving actions. Such programs ultimately may be little different in terms of results from provisions allowing industry to opt out of energy efficiency programs entirely. At the other end of the spectrum, some programs require verified self-directed customer investment and energy savings to be achieved in order for payment into the programs to be waived. Clarity in self-directed customer obligations and M&V of results are necessary if the policy goal is to ensure that self-directed industrial customers contribute to overall efforts to ensure least-cost electricity or gas service at a level on par with the contributions of other customers.

Emerging Industrial Program Directions

Most states with active IEE programs continue to devote much effort to expanding and improving their programs. There are four key areas of particular interest for further program evolution.

- **Expanding and strengthening strategic energy management programs in industry.** Efforts to support implementation of SEM systems in industry (and also commercial and institutional) are gaining momentum in state programs and internationally. Successful implementation of SEM in many industries could have a dramatic impact on capturing more unrealized energy efficiency potential. The benefits of supporting internal company platforms for continual identification and implementation of energy savings measures include more comprehensive identification and prioritization of energy savings investments (including across organizations), high-impact and low-cost behavioral changes, and operational and maintenance improvements, all contributing to the company bottom line. For example, use of greater submetering as part of an SEM initiative may allow previously unclear issues and solutions to come to light, or enable a new energy intensity program to be put in place.

  SEM implementation can be effectively supported through technical assistance and recognition programs or through energy efficiency resource acquisition programs. One key common challenge is how to easily convey options for introducing SEM into different corporate environments and the value proposition of these management systems. Experience has shown that company senior management support for SEM initiatives is necessary for success and strategies are needed to garner such support.

- **Providing energy efficiency incentives for whole-facility performance.** Program expansion to assess energy savings from SEM implementation could provide directions for taking energy efficiency programs that encompass process- or plant-wide opportunities (e.g., providing incentives and assessing savings credits for whole industrial facility performance) as opposed to performance of individual investments or measures. Efforts are underway to determine baselines and performance metrics that can provide sufficiently robust measurements of facility savings so that regulators and the public are confident that funds have produced real and new energy efficiency savings.

- **Valuing and expanding quantification and recognition of project NEBs.** Although there is wide variation between projects, several studies have shown that NEBs from IEE projects, such as broader productivity or quality gains, can be as high as or even higher than the energy cost saving benefits achieved by the projects. Awareness of the importance of quantifying or otherwise highlighting key and large co-benefits is growing. Even so, quantification of these benefits tends to occur mainly after project commissioning as part of project evaluation efforts. Some co-benefits, such as water savings, are relatively easy to quantify, while others, such as safety improvements, are more complex to assess. If programs employed systematic ways to assess some of the NEBs for key projects earlier in the project cycle, the clarity added to both the resulting total returns and shorter project payback could tip the scale on a variety of projects from "wait and see" to implementation.

- **Continuing efforts to expand industrial natural gas efficiency programs.** Although natural gas efficiency programs have been implemented in various states for years, effective coverage of the industrial sector is much less common than for electricity efficiency programs, even though industry accounts for about 26%

of total end-use natural gas consumption in the United States. A key challenge is that most large industrial customers purchase their gas through third-party suppliers, rather than their distribution companies. Another challenge is the recent decrease in natural gas prices (even though many gas saving projects are still cost-effective at current prices). Nevertheless, a number of states and Canadian provinces continue to serve as promising examples in delivery of industrial natural gas efficiency programs, which other states may profit from reviewing. In addition, innovative concepts are under consideration to increase the effectiveness and the reach of gas efficiency programs. One such concept proposes to pool gas and electric efficiency funds to allow participating manufacturers to implement larger and more holistic programs with the flexibility to deliver both electricity and gas savings.

The Importance of Cross Exchange

As this report will show, the experience gained by various states in developing and implementing IEE programs is both diverse and rich. Often, however, valuable details of different programs—and the successes, failures, and lessons learned—are not well known or are poorly understood out-of-state, even though other state practitioners could benefit from these experiences. In addition, early ideas on new programs or improvements to existing ones are common among various practitioners. Opportunities for peer exchange on design and operational specifics could further programs' progress. Finally, there are benefits from greater mutual understanding that can be gained from increased cross-state exchange among different types of stakeholders in the IEE program practice, including regulatory agencies, program administrators, and involved industrial energy users in different states, as well as associated experts.

Various formal and informal networking mechanisms exist for further information exchange. In addition, the State and Local Energy Efficiency Action Network (SEE Action) can play a role in organizational and implementation specific activities on program design and implementation topics of greatest interest. Regional IEE organizations also are well-placed to help foster the increased cross-exchange needed to further ramp up the promising results in IEE programs in the states.

Conclusion

Many opportunities remain to incorporate cost-effective, energy-efficient technologies, processes, and practices into U.S. manufacturing. IEE remains a large untapped potential for states and utilities looking to improve energy efficiency, reduce emissions, and promote economic development. Successful IEE programs vary substantially in operational mode, scope, and financial capacity, but also exhibit common threads and challenges.

Gaining industry support for IEE programs is key; one of the best means to gain increased industry support is by demonstrating the high value of efficiency programs to industrial customers. Experience highlighted in this report will show that IEE programs can effectively deliver value to industries in terms of lower costs, reduced environmental impact, and improved competitiveness, and can help alleviate common resistance by industry to pay into ratepayer programs.

The development and operation of a highly valued IEE program requires a close understanding of the special needs of industrial customers, flexibility in program offerings, and sustained engagement. In practical terms, this means helping industry achieve concrete energy cost reduction benefits, improved competitive position, and additional NEBs such as enhanced productivity and product quality well above the costs of paying into the program. Flexibility in addressing project scheduling and investment cycles, provision of high-quality technical expertise, and comprehensive offerings that include both prescriptive and custom incentives are features of successful programs.

In addition to responding to the needs of industrial customers, IEE programs that leverage strategic partnerships, have robust M&V and evaluation methodologies, and seek to introduce more holistic program approaches, such as SEM and pooled gas and electric programs, will ultimately help program administrators operate more effective programs and deliver significant additional energy savings. As this report will show, states' experience in developing and implementing IEE programs is both diverse and rich. There are benefits from greater mutual

understanding that can be gained from increased cross-state exchange among regulatory agencies, program administrators, industrial energy users, and associated experts.

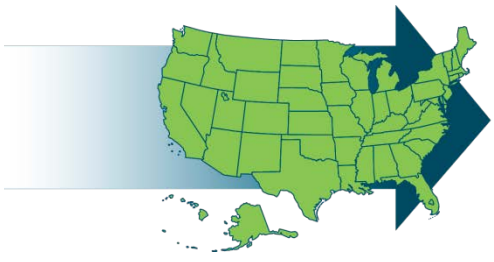
Table ES-1 summarizes the key issues and considerations for regulators and program administrators in designing and implementing effective energy efficiency programs for industry, as well as programs that address that issue. They do not cover all decisions or issues that regulators and program administrators may need to consider because there will undoubtedly be jurisdiction- and case-specific topics that are not anticipated here. However, these considerations provide a starting point for addressing many of the issues that typically arise.

Table ES-1. Summary of Key Issues and Considerations for Regulators and Program Administrators

Topic	Issue	Considerations for Regulators and Program Administrators	Program Examples
The value of energy efficiency projects	Energy efficiency projects may compete with core business investments and decision-making is often split across business units.	• Clearly demonstrate the value proposition of energy efficiency projects to companies • Relay the operating cost savings and other benefits—including profits—lost if energy efficiency improvement opportunities are not addressed.	• Bonneville Power Administration • New York State Energy Research and Development Authority • West Virginia Industries of the Future
Relationships with industrial customers	It takes a long-term relationship for programs to understand industrial operation and needs, and for industrial companies to understand what a program can offer them.	• Long-term relationships with industrial companies enable joint identification of energy efficiency opportunities • Stability in program support and personnel over a number of years is critical.	• Energy Trust of Oregon
Industrial sector credibility and technical expertise	Addressing industrial companies' core needs requires understanding a plant's production processes, operating issues, and the market context the plant operates within.	Effective IEE programs develop credibility with industrial companies by employing staff/contractor experts that understand the industrial segment and have the technical expertise to provide quality technical advice and support issues specific to that industry and customer.	• Efficiency Vermont • Wisconsin Focus on Energy • Xcel Energy (Colorado and Minnesota)
Diverse industrial customer needs	Manufacturers use energy differently than the commercial sector, typically having significant process-related consumption. Focusing on simple common technology fixes alone will miss many of the opportunities.	A combination of both prescriptive offerings for common crosscutting technology and customized project offerings for larger, more unique projects can best meet diverse customer needs and provide flexible choices to industries.	• Rocky Mountain Power • CenterPoint Energy • Xcel Energy
Project scheduling	Scheduling of energy efficiency investments can be heavily dependent on a plant's operational and capital cycle, as proposed equipment changes must be guided through rigorous, competitive, and time-consuming approval processes.	Programs with multi-year operational planning can best accommodate company scheduling requirements, as scheduling of capital project implementation must consider both operational schedules that dictate when production lines may be taken out of operation as well as capital investment cycles and decision-making processes.	• NYSERDA

Topic	Issue	Considerations for Regulators and Program Administrators	Program Examples
Application processes	Industrial customers may perceive the application and implementation procedures for IEE programs to be administratively complex and burdensome.	Achieving the right balance between meeting key program administration needs for information and keeping program procedures simple and efficient may often require a continual process of evaluation and improvement.	• BPA • NYSERDA
Program outreach	Various industrial customers may be unaware of the industrial program offerings that may be most applicable or useful for them due to staff turnover and internal demands.	Steady and continual outreach and dissemination of information, such as examples of successful past projects, is important to encourage participation.	• AlabamaSAVES • NYSERDA
Leveraging partnerships	A range of federal, national, regional, and state initiatives and resources are relevant to state IEE programs, including those provided by the U.S. Department of Energy, the U.S. Environmental Protection Agency ENERGY STAR® program, state energy offices, and the Manufacturing Extension Partnership.	Successful IEE programs often partner with federal, state, and regional agencies and organizations to leverage their expertise, access to customers, and program implementation support capacities.	• AlabamaSAVES • Northwest Energy Efficiency Alliance, Northwest Food Processors Association and BPA
Medium- and long-term goals	Industrial companies and program administrators seek market certainty and reduced risk in ramping up the implementation of cost-effective energy efficiency measures.	Regulators and program administrators can set energy savings goals or targets for the medium- to long-term, coordinated with funding cycles (e.g., in three-year cycles).	• Michigan Self-Direct Energy Optimization Program • Southwest Energy Efficiency Project
Measurement, verification, and evaluation	Effective M&V is critical for program administrators to assess results and measure progress, and is also useful for industrial companies to verify results of their investments.	• Guidelines for M&V need to be clearly defined and periodically reviewed and adjusted • Periodic impact and process evaluations help identify where IEE program efficiency and results can be further improved • Non-energy benefits (NEBs) can be a key element of both project M&V and program evaluation.	• DOE's Uniform Methods Project • International Performance Measurement and Verification Protocol • ETO process evaluations • NYSERDA, Mass-achusetts, and BPA valuation of NEBs
Self-direct programs	There is a wide range in structures of self-direct programs: from those that are only vaguely defined, and include little M&V of energy saving actions, to those that require verified self-directed customer investment and energy savings to be achieved in order for payment into the programs to be waived.	Clarity in self-directed customer obligations and M&V of results are necessary if the policy goal is to ensure that self-directed industrial customers contribute to overall efforts to ensure least-cost electricity or gas service at a level on par with the contributions of other customers.	• Michigan Self-Direct Energy Optimization Program • Puget Sound Energy • Xcel Energy

Emerging Industrial Program Directions			
Topic	**Issue**	**Considerations for Regulators and Program Administrators**	**Program Examples**
Expanding and strengthening strategic energy management programs	Efforts to support implementation of SEM in industry are gaining momentum in state programs.	The challenge of crediting SEM (how to quantify and credit energy savings specifically achieved through SEM), as well as other SEM-related topics, is worthy of further research and cross-exchange.	• AEP Ohio • BPA • BC Hydro • ETO • WFE • Xcel Energy
Program approaches for whole-facility performance	Significant challenges exist in determining baselines and performance metrics that can provide sufficiently robust measurements of facility savings while maintaining practical and easy-to-implement methodologies.	Work on crediting energy savings from SEM could facilitate the provision of incentives and assessing savings credits for whole industrial facility performance, as opposed to performance of individual investments or measures.	• European experience
Capturing non-energy benefits at the project level	Although there is wide variation between projects, several studies have shown that NEBs from IEE projects, such as broader productivity or quality gains, can be as high as or even higher than the energy cost saving benefits achieved by the projects.	If programs employed systematic ways to assess NEBs earlier in the project cycle, the resulting total returns and shorter payback could tip the scale on a variety of projects from "wait and see" to implementation.	• Energy Trust of Oregon
Expanding natural gas programs	• There is less coverage of the industrial sector in natural gas efficiency programs than in electricity efficiency programs. • Most large industrial customers purchase their gas through third-party suppliers rather than their distribution companies. • Most single-fuel utilities administer energy efficiency programs on their own. However, energy efficiency opportunities typically lead to savings in both gas and electric energy use.	• Gas and electric efficiency measures—when delivered together as part of the same project or a combined program—can result in larger, more effective programs that capture more of the technically and economically viable energy efficiency potential. • Innovative concepts are under consideration to increase the effectiveness and the reach of natural gas efficiency programs.	• Efficiency Vermont • ETO • NYSERDA • PG&E • WFE



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