

Industrial Efficiency Programs Can Achieve Large Energy Savings at Low Cost

Industrial energy efficiency programs can provide significant energy savings to society and the utility system at a lower cost than most programs targeted at other sectors. On a national level, the industrial sector saves more energy per program dollar than do other customer classes.¹ Capturing energy savings through industrial programs is one of the best ways to keep energy prices low for all customers. The amount of electricity saved by industrial programs directly displaces the need to invest in more expensive power plants or transmission and distribution (T&D) system upgrades. If these assets are not built, their costs do not need to be recovered in customer rates, keeping electricity bills low and saving money for all customers in the community.

To achieve these benefits, many states, utilities, and program administrators pursue programs aimed at customers who consume large amounts of energy to power their manufacturing processes and industrial plant operations. These programs can facilitate the use of a range of technologies and management practices to reduce energy consumption in the manufacturing sector, generally measured per unit of production.² Because industrial operations vary widely by product, process, facility size, budget, and technical sophistication, a one-size-fits-all approach is not effective. For this reason, a variety of approaches have been developed. These include programs involving technical assistance and knowledge sharing, prescriptive rebates, customized incentives, market transformation, strategic energy management, and self-direct.³

A SMALL GROUP OF CUSTOMERS CAN PROVIDE THE MOST ENERGY SAVINGS

In many utility systems, industrial customers represent a majority of the energy demand and a significant amount of the energy savings opportunity. For example, among all the customers served by Eversource Energy, one of New England's largest energy providers, only 2% of customers account for about 80% of total energy demand.⁴ By establishing strong relationships with a small number of the largest energy users, utilities and program administrators can access a large opportunity for achieving cost-effective energy savings.

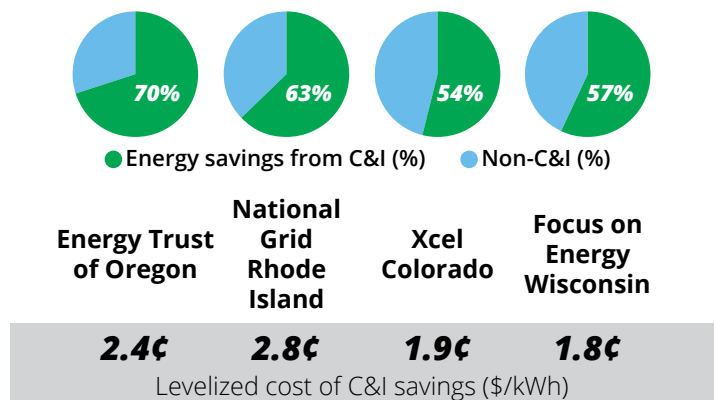
1 SEE Action, Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector (Washington, DC: Prepared by A. Goldberg, R.P. Taylor, and B. Hedman, Institute for Industrial Productivity, 2014). www4.eere.energy.gov/seeaction/publication/industrial-energy-efficiency-designing-effective-state-programs-industrial-sector.

2 US Department of Energy, Barriers to Industrial Energy Efficiency (Washington, DC: DOE, 2015). energy.gov/sites/prod/files/2015/06/123/EXEC-2014-005846_5%20Study__0.pdf.

3 SEE Action, 2014.

4 P. McLean-Connor, "2015 ACEEE Intelligent Efficiency Conference Webinar," 2015. aceee.org/sites/default/files/pdf/conferences/ie/2015/IE15-webinar-ppt.pdf.

Energy savings from commercial and industrial programs



Source ACEEE estimates, based on publicly available program administrator annual reports for 2014. We calculate the levelized cost of the program using the PMT function in an Excel spreadsheet and assume a 13-year measure life and a 5% discount rate.

On average, commercial and industrial (C&I) customers contribute 55% of total energy efficiency program savings.⁵ As shown in the figure, this amount varies and can be higher in some states. For example, C&I programs achieved approximately 70% of Energy Trust of Oregon's savings in 2014.⁶ The variation among states may be due to a number of factors, such as differences in the size of industrial energy savings potential or the existence of a specific regulatory requirement to acquire savings from the industrial class. Regardless, reaching industrial customers is always an important component of a comprehensive strategy for managing energy demand and achieving statewide energy savings targets.

INDUSTRIAL SECTOR SAVINGS CAN BE THE CHEAPEST TO ACHIEVE

Industrial customers often represent the most cost-effective energy savings opportunities and can significantly reduce the overall cost of a utility's energy efficiency portfolio. C&I programs implemented across the country—including those offered by Focus on Energy Wisconsin, National Grid in Rhode Island, and Energy Trust of Oregon—demonstrate that industrial programs can be twice as cost effective as programs targeting the residential sector.⁷ One reason C&I programs cost less on average

5 M. Molina, The Best Value for America's Energy Dollar: A National Review of the Cost of Utility Energy Efficiency Programs (Washington, DC: ACEEE, 2014). aceee.org/sites/default/files/publications/researchreports/u1402.pdf.

6 ACEEE estimate based on 2014 Annual Report to the Oregon Public Utility Commission & Energy Trust Board of Directors.

7 See Appendix A, SEE Action, 2014.

is because these measures tend to have longer lifetimes than many residential measures.⁸ As shown in the figure, the levelized cost of savings from a range of C&I programs implemented in 2014 was less than three cents per kilowatt hour. That means investing in industrial efficiency programs is one-third to one-half the cost of generating the same amount of electricity from traditional power sources. Despite this, most states harness only a fraction of their industrial energy efficiency potential.

10 TIPS FOR DESIGNING GOOD INDUSTRIAL PROGRAMS

Administrators have sometimes struggled to create energy efficiency programs that are responsive to the unique needs of large customers and address claims that customers have already done all the efficiency upgrades possible. However, well-designed programs in numerous states do address these concerns and continue to provide more value than the program costs. According to one customer, participation in Energy Trust of Oregon's industrial program helped achieve higher levels of energy efficiency and cost savings. "We couldn't have accomplished this level of energy efficiency without the financial and technical assistance provided by Energy Trust," said Malcolm Delaney, executive site director for Maxim Integrated Products, a leading manufacturer of integrated circuits. Maxim Integrated received more than \$500,000 in incentives for several process efficiency projects that are expected to save more than 3.5 million kilowatt hours of electricity and \$250,000 in electricity costs each year.⁹

In a recent guide produced by DOE's State and Local Energy Efficiency Action Network (SEE Action), analysts and practitioners highlighted 10 best practices that consistently add value for industrial customers and contribute to utility program success.¹⁰ The most successful industrial energy efficiency programs do the following:

1. **Clearly demonstrate the value proposition.** Programs should teach customers how to understand and quantify the full scope of operating cost savings and other benefits that result from investments in energy efficiency.
2. **Develop long-term relationships.** Programs must provide a consistent contact person and establish a level of credibility and trust with industrial customers to enable joint identification of opportunities and analysis of savings.
3. **Offer quality technical expertise.** Program staff and contractors must have a professional understanding of each plant's core production processes and operating issues to provide quality technical advice and support. This often means hiring contractors with specialized expertise in particular processes.
4. **Provide both prescriptive and custom options.** Programs should offer a combination of simple prescriptive options for

common projects and customized options for more complex projects that require tailored solutions.

5. **Accommodate customer schedules.** Programs must consider the industrial company's operational schedule, capital investment cycle, and decision-making processes so that energy efficiency projects align with internal drivers.
6. **Streamline application processes.** Programs should strike a balance between meeting program administrative needs and keeping procedures easy to understand and applications simple to submit in order to facilitate participation.
7. **Conduct targeted outreach.** Programs administrators should conduct continual outreach to ensure that industrial customers are aware of program offerings.
8. **Leverage partnerships.** Program administrators should seek to partner with federal, state, and regional agencies and organizations such as local trade associations to leverage their expertise, access to customers, and program implementation support capacities.
9. **Set energy savings goals.** Programs should establish and report on medium- and long-term energy savings goals, such as six-month and three-year cycles, which can serve as an investment signal for industrial customers and create certainty for program administrators.
10. **Undertake measurement and verification.** Programs should use accredited measurement and verification (M&V) protocols that are accepted by multiple state regulatory agencies to assess achievement of utility portfolio goals, demonstrate results of the investment to regulators, and help manufacturers see the impact of their investment internally.

INDUSTRIAL PROGRAMS NEED SUPPORT FROM POLICYMAKERS

As program administrators work to incorporate the attributes above, support from policymakers is needed to help encourage the development of good industrial programs that can achieve large energy savings at the lowest cost. The industrial sector is not widely understood, and education of and engagement with the regulatory community are needed to enable better oversight of utility programs. Regulators should set high targets for energy savings from utility programs and support new program models that are responsive to the industrial customer class. Implementing well-designed programs benefits the sector by boosting the productivity of manufacturers and benefits the state by helping attract and retain new business development. Local citizens can benefit too from the highly cost-effective energy efficiency resources that good industrial programs acquire. For a more detailed explanation and examples of programs that have adopted these principles and achieved significant energy savings, see the full SEE Action guide, *Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector*.

⁸ Molina, 2014.

⁹ Energy Trust of Oregon, Chip Fabricator Crystallizes Commitment to Energy Efficiency (2010). assets.energytrust.org/api/assets/success-stories/PE_MaximIntegrated_CS.pdf.

¹⁰ These 10 features were originally identified by the SEE Action Industrial Energy Efficiency and Combined Heat and Power (IEE/CHP) Working Group (SEE Action, 2014).