

INDUSTRIAL TECHNICAL ASSISTANCE

Supports the deployment of energy efficient manufacturing technologies and practices, including strategic energy management and combined heat and power, across American industry through training programs, site assessments, and standards development.



CHP System at Frito Lay facility in Killingly, Connecticut.
Photo courtesy of Energy Solutions Center.

The Opportunity

The industrial sector has an annual energy bill of more than \$200 billion.ⁱ However, there are significant cost savings available in the industrial sector through cost-effective investment in energy efficiency and combined heat and power (CHP), i.e., the concurrent production of electrical power and useful thermal energy from a single fuel source. Many facilities can save 15% or more annually through projects with payback periods of less than 3 years.ⁱⁱ

The industrial sector has the potential to invest more than \$100 billion in cost-effective, energy efficiency technologies by 2020, which would result in total energy savings of 5 quadrillion Btu and annual cost savings of almost \$50 billion.ⁱⁱⁱ A host of market and non-market barriers, such as awareness, financial, policy, organizational, often prevent industrial companies from investing in greater energy efficiency.

Goals and Accomplishments

Industrial Technical Assistance Goals:^{iv}

- Reduce manufacturing energy intensity by 25% over 10 years.
- Support the deployment of 40 GW of new, cost-effective CHP by 2020.

Accomplishments:

- More than 120 companies committed to savings of 25% over 10 years with reported cumulative energy savings of approximately 190 trillion Btu, and 14 facilities were certified under a new program—Superior Energy Performance—that aims to drive continual improvement in energy management.
- AMO has delivered technical assistance to thousands of industrial plants—saving billions of dollars and cutting carbon emissions by millions of tons.
- During fiscal years (FY) 2009–2012, the regional Clean Energy Application Centers (CEACs), now known as CHP Technical Assistance Partnerships (CHP TAPs), provided technical support to more than 440 CHP projects. Nearly 270 of those

projects received Technical Site Evaluations, and the remainder were provided with other types of technical assistance, often on multiple occasions. Of those projects, more than 170 are currently under development or online with an estimated installed capacity of 1.4 GW.^v

Energy-Savings Partnerships

Better Buildings, Better Plants Program & Challenge

The Better Building, Better Plants Program (Better Plants) and Better Plants Challenge are the industrial components of the Better Buildings Challenge. The U.S. Department of Energy (DOE) offers manufacturers two opportunities to engage in Better Plants based on their level of commitment (either as a Program Partner or Challenge Partner). More than 120 Partners, representing more than 1,700 plants and close to 8% of the total U.S. manufacturing energy footprint, have committed to reduce their energy intensity by 25% over 10 years. As of August 2013, Partners have saved about 190 trillion Btu and \$1 billion.^{vi}

Partners are implementing cost-effective, energy efficiency improvements that save money, create jobs, promote energy security, and strengthen the competitiveness of the U.S. manufacturing sector. Any company in the U.S. manufacturing sector may become a Better Plants Partner, regardless of size or level of energy management expertise. By participating in the Better Plants Program, companies receive certain benefits, such as national recognition for their efforts and technical support from DOE.

Efficient On-Site Energy

Combined Heat and Power

AMO's CHP Deployment Program provides stakeholders with resources necessary to identify CHP market opportunities and supports implementation of CHP systems in industrial, commercial, institutional, and other application. Site specific technical assistance is provided through regional CHP TAPs, previously called CEACs. The CHP TAPs promote cost-effective CHP, waste heat to power, and district energy with CHP. Services

include market assessments for CHP; education and outreach to provide information on the benefits and applications of CHP to state and local policymakers, regulators, energy end-users, trade associations, and others; and technical assistance, including project screenings and feasibility analyses, for energy end-users and others to help them consider CHP.

The CHP TAPs also offer technical assistance to the more than 550 major source facilities using coal or oil impacted by the Environmental Protection Agency's Boiler MACT regulation.^{vii}

Industrial Strategic Energy Management

Strategic energy management is a long-term, continual improvement approach to efficiency that includes goals, tracking, and reporting.

Superior Energy Performance

Superior Energy Performance (SEP) is a certification program that provides industrial facilities with a transparent, globally accepted system for verifying energy performance improvements and management practices. SEP enables facilities to achieve continual improvements in energy efficiency while boosting competitiveness. A central element of SEP is implementation of the global energy management standard, ISO 50001, with additional requirements to achieve and document energy performance improvements. Fourteen demonstration plants have achieved SEP certification. Nine of these plants have shown an average energy performance improvement of 10% in the first 18 months of SEP implementation, with an average payback of 1.7 years.^{viii}

Industrial Strategic Energy Management Accelerator

DOE is expanding the Better Buildings Initiative to engage leaders in a set of Better Buildings Accelerators designed to demonstrate specific innovative approaches, which upon successful demonstration, would accelerate investment in energy efficiency. The Industrial Strategic Energy Management Accelerator is designed to demonstrate SEP as a practical and cost-effective energy efficiency program offering. Signatories to this Accelerator are utilities and energy efficiency program administrators that

agree to deploy SEP to a set of industrial customers across their service territories. For more information on this Accelerator, visit eere.energy.gov/buildings/betterbuildings/accelerators/.

Energy Assessments & Student Training Industrial Assessment Centers

Small- and medium-sized manufacturers may be eligible to receive a no-cost assessment provided by Industrial Assessment Centers (IACs). Teams located at 24 universities around the country conduct energy audits to identify opportunities to improve productivity, reduce waste, and save energy. On average, each manufacturer identifies about \$140,000 in potential annual energy savings and implements more than one-third of these savings within the first year of the assessment. When accounting for some persistence of savings, since 1981, more than 16,000 IAC assessments have resulted in nearly \$5.9 billion in energy savings and close to 28 million metric tons in CO₂ emissions reductions.

As a result of performing assessments, upper class and graduate engineering students receive unique, hands-on assessment training and gain knowledge of industrial process systems, plant systems, and energy systems—making them highly attractive to employers. More than 60% of IAC graduates pursue energy-related careers. The IAC program provides industry with a workforce of energy engineers with real-world training who will contribute to improving industrial efficiency throughout their careers.

Software Tools & Training

To accelerate the widespread adoption of energy efficient technologies and practices, AMO provides a range of software tools and training to help facilities manage and optimize energy use of critical equipment such as steam and boiler systems, process heating, compressed air, motors, pumps, and fans.

For More Information

AMO Industrial Technical Assistance program:
eere.energy.gov/manufacturing/tech_assistance

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ⁱ U.S. Energy Information Administration, *Annual Energy Outlook 2012*

ⁱⁱ Data analysis using information from the IAC database.

<http://iac.rutgers.edu/database>

ⁱⁱⁱ McKinsey & Co., *Unlocking Energy Efficiency in the U.S. Economy*, July 2009, Page 75.

^{iv} Department of Energy FY 14 Congressional Budget Request

^v 2012 CEAC Tracking Spreadsheet/ORNL

^{vi} Data analysis using information from Better Plants Partner reported savings.

^{vii} http://www.epa.gov/airquality/combustion/docs/20121221_sum_overview_boiler_ciswi_fs.pdf

^{viii} <http://industrial-energy.lbl.gov/files/industrial-energy/active/O/LBNL-6349E.pdf>