

Implementing an Industrial Energy Efficiency Program in Minnesota

Industry accounted for approximately 30% of all the energy consumed in Minnesota in 2005. In order to support the Minnesota state legislature's requirement that utilities meet an energy savings goal of 1.5% of gross annual retail energy sales, the state has implemented an efficiency program focused on industrial energy usage. To achieve the program goals, the Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota has coordinated, organized, and implemented training sessions, energy assessments, technology demonstrations and pilots, and technical assistance services.

Minnesota has identified seven high-energy-use manufacturing sectors on which to focus efforts: chemical manufacturing, ethanol production, food processing, metal casting, metal fabrication, mining, and pulp and paper. MnTAP is supporting these industrial sectors and their subsectors by identifying barriers to efficiency implementation, opportunities for overcoming barriers, and other mechanisms—including utility incentives—that aid in efficiency technology and best practices implementation. MnTAP is also utilizing a “technology diffusion” model as a multistep risk-reduction methodology to accelerate innovative technology adoption. This model has been proven to increase the technology implementation rate from 30% to 50%.

Progress and Milestones

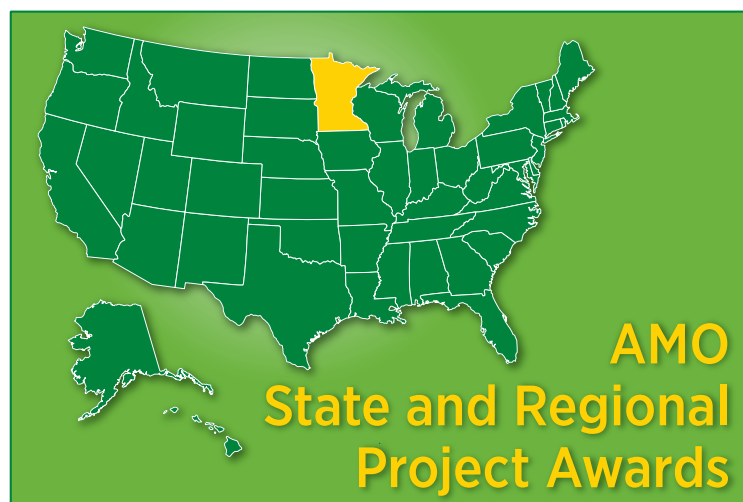
Activity Description	Goal	Completed to Date
Assessments	15	24
Identified Energy Savings (Trillion Btu)	.42*	.37
Implemented Energy Savings (Trillion Btu)	.02*	0.02
Trainings	3	3
Individuals Trained	60	129
Pilots / Demonstrations	3	3
Plants Impacted	**	784

NOTES:

* Phase II only; no goal set for Phase I

** For training and technology demonstration metric, goals were related to number of attendees rather than unique plants.

(As of June 2011)



Project Description

Funding Amount: \$875,568

Funding Source: American Recovery and Reinvestment Act

Program Period: 9/30/2009 to 3/31/2013



Project Success Highlights

- Three workshops were delivered—one each on steam, compressed air, and fan systems—hosting more than 100 participants total and resulting in 1,030 million Btu and \$17,300 annual savings.
- Three technology demonstrations were delivered—one each on compressed air, power co-generation and steam systems, low-temp conversion coating. The events were attended by more than 30 participants.
- Completed 10 more assessments than planned (25 total), resulting in approximately 21,515 million BTU and \$240,454 in energy savings.
- As a direct result of the training and assessments, one company will host MnTAP 2011 summer interns. A second company will host a summer 2012 intern.
- Following the steam assessments, three energy teams were formed to focus on implementation of assessment recommendations.

Primary Investigator

Minnesota Technical Assistance Program, University of Minnesota, Minneapolis, MN

Project Partners

Center for Energy and Environment, Minneapolis, MN
Iowa State University Industrial Assessment Center, Ames, IA
Minnesota Department of Commerce, Office of Energy Security, St. Paul, MN

The Technology Diffusion model is a multi-step risk reduction process that accelerates the penetration and adoption of pollution prevention technology innovations into the marketplace. In essence, the model suggests the following sequential steps:

1. Identify best practices.
2. Identify opinion leaders.
3. Recruit mentors.
4. Establish demonstration sites at opinion leader facilities.
5. Provide demonstrations to customers.
6. Conduct pilot trials.
7. Adopt innovation.

Five criteria, as outlined in the table below, are used and weighted relative to each other to determine whether to pursue a technology. For this project, the criteria in the table below have been used to determine system areas on which to focus project efforts.

Criteria for Pursuing Technologies

Criteria	Definition
Relative advantage	Better idea than before, better quality, lower price
Compatibility	Supports existing values, past experiences, comfort level, needs, fits current operations
Complexity	Fits workforce and culture; not difficult to understand or use
Observability	Understandable, visible and available to others
Trialability	Ability to experience and experiment with

The project has positively impacted collaboration among state, utility, and company project partners. As a result of the efforts of MnTAP, there has been increasing motivation among project partners to achieve the State of Minnesota goal of reducing annual energy retail sales by 1.5% (Next Generation Act of 2007). The project has developed a strong reputation and established relationships between MnTAP, the State Energy Office, Minnesota's utilities, and manufacturers, leading to a collaborative effort that will ensure successful project completion. Additionally, the program's regional outreach approach has succeeded in reaching many members of Minnesota's diverse manufacturing community.

In support of MnTAP goals to reduce energy consumption, onsite energy assessments have been conducted to identify reduction opportunities and provide companies with an action plan for energy reduction. The program continues to promote the Center for Energy and Environment (CEE) and Iowa State University-Industrial Assessment Center (ISU-IAC) assessments. As a result of this marketing effort, ISU-IAC conducted two industrial energy audits, and an additional three CEE assessments were completed.

In addition to conducting energy assessments, the project is working toward increasing rates of post-assessment project implementation. Implementation teams continue to work with two companies—PM Beef and Pace Dairy—in partnership with

Benefits

- Train and educate Minnesota manufacturers about energy-reduction opportunities.
- Assist manufacturers in identifying energy-saving opportunities through assessments.
- Provide manufacturers technical assistance to implement energy saving opportunities.
- Display energy efficiency benefits to companies through technology demonstrations.

Applications in Our Nation's Industry

This project will establish an industrial efficiency collaborative in Minnesota that will help the state meet its economic and environmental goals. In addition to the U.S. Department of Energy (DOE), the key partners include Minnesota's Center for Energy and the Environment; the Minnesota Office of Energy Security; the Iowa State University Industrial Assessment Center (IAC); and utility, industry, and trade associations. This project will also solidify the MnTAP collaborative as an important resource for Minnesota industries and utilities. MnTAP will utilize the project's experiences to assist utilities without efficiency programs and help increase the overall implementation of industrial efficiency technologies. The reduction of industrial energy intensity in Minnesota would achieve 2% of the DOE Advanced Manufacturing Office (AMO's) goal of reducing industrial energy intensity by 25% over 10 years.

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

Minnesota Energy Resource Corporation (MERC) following two separate steam assessments. The teams meet with PM Beef and Pace Dairy on a monthly basis to support the companies as they move forward with project implementation. PM Beef has achieved savings equal to 42% of the total million Btu identified during the assessment; Pace Dairy has achieved 395% of identified energy savings, exceeding the goals for that project.

System specific training events and technology demonstrations have been administered to educate end-users on energy saving technologies, ways to identify energy saving opportunities in facilities, and quantifying savings utilizing DOE tools. Targeted systems were power co-generation and steam systems, low-temperature conversion coating and compressed air, and fan systems. A total of three training sessions and three demonstrations were held, reaching 167 individuals.

For Additional Information:

Sarah Haas

Project Lead

Minnesota Technical Assistance Program (MnTAP)

University of Minnesota

McNamara Alumni Center

200 Oak Street SE, Suite 450

Minneapolis, MN 55455-2070

Phone: 612-624-5119

Fax: 612-624-3370

E-mail: haasx132@umn.edu

Laura Babcock

Director, MnTAP

Minnesota Technical Assistance Program (MnTAP)

University of Minnesota

McNamara Alumni Center

200 Oak Street SE, Suite 450

Minneapolis, MN 55455-2070

Phone: 612-624-4678

Fax: 612-624-3370

E-mail: lbabcock@umn.edu

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

EERE Information Center

1-877-EERE-INFO (1-877-337-3463)

www.eere.energy.gov/informationcenter

DOE/EE-0633 • December 2011

Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 10% post consumer waste.