

Ask the Energy Expert

Testing the Elements of Superior Energy Performance

Dow Improves the Energy Efficiency of Its Texas City Operations by Applying SEP Standards

Dear Energy Expert:

Your company is testing the elements of the Superior Energy Performance energy management certification program. What challenges or benefits have you experienced by implementing a new energy management standard into your existing corporate energy management system?

The Dow Chemical Company (Dow) is a provider of plastics, chemicals, and agricultural products. Dow connects chemistry and innovation with the principles of sustainability to help address many of the world's most challenging problems. The company's diversified industry-leading portfolio of specialty chemical, advanced materials, agrosiences, and plastics businesses delivers a wide range of technology-based products and solutions to customers. Dow's products have presence in approximately 160 countries and in high-growth sectors, such as electronics, water, energy, and coatings. In 2009, Dow had annual sales of \$45 billion and employed approximately 52,000 people worldwide.

Background

Dow has long championed energy efficiency and has institutionalized a corporate energy management system into its operations. The company has achieved remarkable success, improving its energy efficiency 38% since 1990, corporate-wide. As a founding and active member of the U.S. Council for Energy-Efficient Manufacturing—a group charged with developing Superior Energy Performance (SEP), a forthcoming American National Standards Institute-accredited energy management certification program—it naturally followed that Dow would join in piloting the standards of the program (the next and current phase of the SEP project). Dow chose its Texas City, Texas, operations to participate—an integrated site with numerous systems tied together, representing approximately \$50 million in annual energy costs. This balanced well for SEP, as some of the other pilots are smaller projects, running at about \$10 million in annual costs. For Dow, integrating a new—but

not wholly different—energy management standard has been the main adjustment.

Integrating SEP Standards

In general, a crucial component to successfully implementing a new energy management system is strong leadership commitment. Leadership support is imperative to a company's success, as they set the tone for resources, programs, and adopting SEP. One of the challenges we experienced at the Texas City plant was not lack of leadership support, but that the implementation occurred during a time of significant organizational change. However, having a seasoned energy champion on-site helped us maintain momentum and focus during the critical implementation phase. Although Dow has long recognized the importance and benefits of energy efficiency and has operated under a corporate energy management system for many years, our Texas City plant found new benefits in adopting the specific elements of the SEP program. Through application of the standard requirements (MSE 2000), SEP has given us a more complete approach, down to our plant-level operations. It has helped us translate our corporate requirements into site-specific best practices.

SEP offers flexibility in its implementation to accommodate plants that have a mature program in place and have harvested most of the available energy-saving opportunities, as well as those who may be starting the journey or still have ample improvement opportunities.

In Texas City, we felt that the SEP performance improvement approach would enhance the energy efficiency initiatives already in place. We implemented two projects during the SEP implementation effort. The first project was actually initiated prior to SEP implementation, but was identified as having energy efficiency benefits as well. The project installed feed pre-heat on a distillation column utilizing the hot bottoms stream from another distillation column. The original intent of the project was





to address a production bottleneck. By applying SEP's approach to the process, we were able to identify the energy efficiency improvements. This project met Dow's internal rate of return.

The second project involved our isopropanol processes. A recent upgrade of the process control system presented the opportunity to implement advanced controls to the process. The SEP significant energy user concept helped identify the controls that would have the biggest impact on energy efficiency. We identified an opportunity to optimize the amount of sparged steam into the hydrolysis process. We executed a six sigma project and were able to find the optimal sparge steam ratio. A benefit of SEP is that it is not prescriptive or overly burdensome, and we've applied it to our unique needs. It didn't necessarily take away from our existing program, because anyone can benefit from SEP's comprehensive, best practices approach.

Projects were also implemented in the site utilities area. The SEP concept of establishing a baseline helped identify an opportunity to improve the efficiency of a steam turbine generator. Over time, steam turbine efficiencies degrade over extended run times. Monitoring steam turbine efficiency versus baseline data helped justify an overhaul of the machine.

A similar review of boiler data revealed a subtle decline in boiler efficiency. A simple maintenance project to wash the economizer tubes during the next scheduled outage resulted in measureable improvement in boiler efficiency. SEP has been a flexible, results-driven approach that has worked well for scheduled efficiency upgrades, but has also worked for conditions-based upgrades as well.

Conclusion

We believe SEP will have a positive response with industry. It has worked well in Texas City, helping us improve the way in which we manage the energy performance. Dow has a long history of integrating energy management into its corporate culture, but anyone can realize benefits from implementing SEP. When the ISO50001 standard is finalized, we will only have to make minor tweaks to our system. Companies that participate in SEP are provided a road map for achieving continual improvement in energy efficiency.

Ask the Energy Expert is an ongoing column with the intent of providing information and solutions for industry's most pressing questions. This issue's Energy Expert is **Joe Almaguer, Global Energy Efficiency Leader at The Dow Chemical Company.**

Save Energy Now LEADER Mannington Mills Delivers Webcast on the Role of an Energy Manager

Mannington Mills—manufacturer of residential and commercial resilient, laminate, hardwood, and porcelain tile floors—has partnered with the U.S. Department of Energy's Industrial Technologies Program (ITP) as a *Save Energy Now* LEADER, pledging to reduce its industrial energy intensity 25% over the next 10 years.

On July 1, 2010, Richard Miller, corporate energy manager at Mannington Mills, delivered a Thursday Webcast for Industry presentation on the "Role of an Energy Manager." During the Webcast, Miller touched on

- Energy benchmarking
- Goal setting
- Monitoring and verification of energy flows
- Training and communications
- Carbon footprint reduction initiatives.

The Fall 2010 issue's *Ask the Energy Expert* column will feature energy-saving recommendations by Miller.

Learn more about Mannington Mills at <http://www.mannington.com/>.

Access ITP Thursday Webcast for Industry presentations at http://www1.eere.energy.gov/industry/resources/thursday_webcasts.html.