

# Energy Best Management Practices from 2005

When Hurricane Katrina ripped through the Gulf Coast last summer, it not only set a record for the costliest natural disaster in U.S. history (estimated at \$100-\$200 billion), it also set in motion a ripple effect on energy prices that will be felt by all of us this winter. Damage to the offshore pipelines and processing plants is causing near-term shortages until full capacity can be restored. For commercial operations, some industry analysts predict natural gas prices will average about \$13 per MMBtu through the winter, assuming normal weather. Extreme cold or further supply disruptions could trigger even higher price spikes.

These short term predictions (and longer term trends) are causing healthcare institutions and other users to ramp up their energy management programs like never before. If your hospital is one of them, ENERGY STAR may be able to help. Each year, we compile energy best management practices from a select group of commercial and industrial partners, many of whom compete for EPA's ENERGY STAR "Partner of the Year" award. Many of these partners are responding to the call from EPA's Administrator to take the ENERGY STAR Challenge and reduce energy use 10% at time. These companies and institutions have created the infrastructure to continually address energy management. Not surprisingly, these leading organizations have made significant reductions in energy use and reduced their exposure to price volatility because they demand less energy – in some cases, by as much as 40% less energy than the average used in their sector.



What follows are some of the common elements found in leading energy management plans and examples of how these partners implemented them within their organizations in 2005.

## **Instituting an Energy Policy at 3M**

3M, a global diversified technology company, created an integrated worldwide energy policy that extends the accountability of the energy program beyond environmental and operations divisions to their research & development department process engineers, and facility design engineers. Their policy sets goals that support the broader goals of the company to drive innovation with energy saving products and optimize capital investment. 3M revised their energy policy in 2004 after soliciting feedback on their policy from manufacturing directors, plant managers, plant operations and executive management. This process paid off when reviewers suggested the inclusion of manufacturing directors in energy management activities because their support is essential to program success. Energy policy revisions showed significant results for 3M in their first year of implementation. Energy efficiency improved by 8.3% in 2004.

## **Assessing Performance at Giant Eagle**

Giant Eagle, one of the largest supermarket chains in the U.S., uses EPA's energy performance rating system ([www.energystar.gov/benchmark](http://www.energystar.gov/benchmark)) to identify stores that are good candidates for retrofit or re-commissioning and to track energy savings over time. It also does more specific energy use analysis to identify areas where reductions can be made.

At Giant Eagle, specific energy-intensive equipment accounts for the majority of energy expenses. For this reason, the supermarket chain allocates special attention to monitoring this equipment.

Energy sub-metering systems monitor equipment such as refrigeration systems, HVAC, and lighting on an hourly basis. Using two months of data, an energy model is created through a regression analysis that accounts for inside and outside temperature and humidity, day of week, and time of day to develop an energy profile for each piece of equipment.

With the baseline energy use established, Giant Eagle stores undergo a re-commissioning that optimizes the set-points, checks proper operation of equipment, and programs schedules for lighting and HVAC units. After re-commissioning, Giant Eagle establishes a new baseline based on the optimal operation of the store. This optimized baseline becomes the performance standard for the store and any 5 percent variation from optimal performance is quickly addressed.

By understanding and addressing energy use where it is concentrated, Giant Eagle is able to verify an average 12 percent reduction in a store's energy use from re-commissioning.

### **Establishing Energy Goals at Toyota**

"Kaizen," which means continuous improvement, is incorporated into design principles for all new Toyota Motor North America facilities. Kaizen is applied to energy use in all facilities, and so Toyota established the goal that each new production plant must be more efficient than the last plant built. Toyota believes this goal is achievable and a critical part of their corporate energy program. They have also found that implementing the Kaizen objective has led to new technological improvements in plant design and construction. Setting specific performance targets for new plants has helped Toyota decrease energy intensity by 26% in 8 years.

### **Creating an Action Plan at Allergan**

Allergan, a major manufacturer of prescription drugs, had an existing energy management structure, but believed it could achieve more. Managers decided to identify opportunities and gaps using ENERGY STAR's Energy Program Assessment Matrix. The matrix evaluation helped Allergan realize that they did not have an energy policy endorsed by senior management, nor any systematic real time monitoring, training, benchmarking, or goal re-evaluation.

Based on this assessment, Allergan updated and enhanced their employee awareness campaigns, and improved the training and certification programs for their engineers. Creating a new energy policy also resulted in the inclusion of the energy program as a

topic in the corporation's Capital Committee. This allowed energy projects to compete for capital on the same level as other projects and helped the energy team understand their financial thresholds and challenges. Improving the overall quality of the energy program enabled Allergan to build a new facility for energy intensive Research & Development work while simultaneously decreasing their energy intensity per square foot by +2%

### **Implementing an Action Plan at Frito-Lay**

Frito-Lay makes energy management training a key corporate priority. Frito-Lay holds an annual Energy Summit to train staff about the importance of energy management and best practice sharing. The Energy Summit is attended by over 300 employees and gives senior management the opportunity to present energy management successes and future challenges to all those involved with energy management. At the multi-day meeting, plant "energy champions" discuss a wide range of specific energy topics, such as "toast oven heat recovery," to facilitate internal best practice sharing. The Summit also features a vendor expo that is attended by major suppliers. Frito-Lay finds that the event really pays off. In 2004, their electric and natural gas usages were 13% and 18% below their 1999 baselines.

### **Measuring Results at Merck**

Tracking the progress and value of their energy program provided unexpected benefits for Merck's Energy Team. By regularly reviewing data on energy demand, Merck's Energy Reduction Initiative Team (MERIT) noticed how efforts to reduce energy usage also lowered demand on heating & cooling.

The corresponding result of the reduction in energy demand enabled MERIT to eliminate or postpone additional capital investments that would have otherwise been needed for higher-capacity equipment. Merck's total capital avoidance from the date of their program's inception totaled in excess of \$26 million. With their Corporate Finance department, the Team was able to demonstrate the resulting cost savings to senior management and make the case that improvements in facility energy use need to be made on a continuing basis.


Because of these benchmarking results, MERIT was able to secure two special financial allocations from management for energy-related projects. These allocations, totaling over \$12 million, were rewarded for projects in 2004 and 2005, and have a payback period of less than 3 years. Not having to compete with other core business projects enabled more energy projects to go forward - a best practice the Merck Energy Team hopes to continue.

## Recognizing Achievements at Colorado School District 11

In 1999, Colorado School District #11 developed a Resource Conservation Management (RCM) program to alter its approach to energy management from one of just paying the bills, to actively working to reduce costs. The program represented a major shift in thinking and required a creative approach for meaningful participation.

The school district's solution was a cash incentive award program. Twice per year, the district awards cash incentives to schools based on its student population and measured energy savings. Building managers have embraced the program and come to rely on the incentive awards for a substantial portion of their annual budget. The schools have developed educational programs such as the "Lights Out Campaign" to raise awareness among teachers, students and staff about conserving energy.

In 2004, the RCM Program saved the school district almost \$800,000 and awarded \$329,000 back to schools for their participation. The 2004 savings are equivalent to the salaries of 27 additional entry-level teachers.

For best practice examples from New York Presbyterian Hospital, EPA's ENERGY STAR Partner of the Year for 2005, see the May/June 2005 edition of *Inside ASHE*. For more examples of organizations meeting the ENERGY STAR Challenge by reducing energy use 10% at a time, visit the [energystar.gov](http://energystar.gov) website. 

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