



Rolling Up the Savings: Corporate Energy Management at Continental Tire

A Corporate Energy Management Case Study

Contact: Christopher Russell, Director of Industrial Sector, (202) 530-2225 crussell@ase.org

OVERVIEW

Like most manufacturers that seek to control energy costs, Continental Tire's Mt. Vernon, Ill. facility pondered a fundamental choice -- partner with an energy consultant or use in-house staff and resources. Continental eventually did both, and to good effect. Modular Process Control (MPC), an energy service provider, implemented both technical and organizational improvements. Continental's first round of energy savings, while in partnership with MPC, generated over half of the total savings that the company would eventually capture. MPC turned over day-to-day energy management to Continental's newly-formed in-house team, which picked up additional savings. Compared to a 1995 base line, Continental currently enjoys 31 percent energy savings per tire produced.

What was the desired outcome of the corporate energy management (CEM) effort?

Continental's Mt. Vernon facility staff recognized that energy management was a way to trim costs and help the parent company remain competitive.

What issues (or symptoms) led to the implementation of CEM?

Continental began pursuing energy-efficiency opportunities in 1994 to the extent that its staff time and expertise permitted. The Mt. Vernon facility secured the services of Modular Process Control (MPC) in 1995, which implemented an energy management system tailored in cooperation with Continental's management.

What technical, managerial, and behavioral elements were developed?

MPC's activities included (1) creating an energy consumption baseline for Continental's process activities; (2) submetering of energy within the facility to better understand energy value-added with each stage of production; (3) establishing a metrics protocol for monitoring and controlling energy usage at key stages of production; (4) establishing organizational structures for managing energy performance; and (5) raising awareness of energy-efficiency opportunities, victories, and rewards through in-house communications.

Energy management is a part-time pursuit for all members of the energy team. The facility engineer devotes about 10 percent of his time, or about 30-45 minutes per day, to energy. Other team members apply about 2-3 percent of their time to energy management.

How are empowerment and accountability addressed?

Unlike most other cases in this series, Continental's energy management lacks consistent corporate backing. Corporate interest in energy consumption was most acute during the 2001 run-up in natural gas prices, but interest subsided with the subsequent drop in prices. While corporate directors don't review energy performance on an ongoing basis, energy cost control does play a role in their strategic decision-making. For example, Continental recently suspended production at a Kentucky plant because of inefficiencies that included high energy costs.

Since 2001, key personnel at the Mt. Vernon facility, including the powerhouse supervisor, have sustained energy management initiatives. Energy use is routinely factored into the evaluation of any major asset upgrade. Energy management efforts to date have been focused more on awareness and behavior. There has not been a lot of resistance

FACTS & FIGURES

Continental Tire North America: The North American subsidiary of Germany-based tire manufacturer Continental AG makes tires for cars, light- and heavy-duty trucks, motorhomes, SUVs, and agricultural and industrial vehicles.

Revenues: \$849.5 million (est.) in 2003 for total N.A. operations

Scope of operations: U.S.: Continental maintains three U.S.-based manufacturing operations and one in Mexico. This case study refers only to the Mt. Vernon, Ill. facility, which has 54 acres of floor space.

Energy management team: Seven staff contribute to the Mt. Vernon plant's energy management: the facility engineer, the plant engineering manager, the maintenance manager, an electrical engineer, the powerhouse supervisor, the purchasing manager, and an accounting professional.

Annual energy spend: Continental's Mt. Vernon facility spends about \$14-15 million on energy, which is equivalent to nominal energy spending in 1994. Note, however, that production has increased 25 percent and fuel prices have risen markedly since then. Energy consumption includes electricity and natural gas, primarily for raising steam.

Key energy professionals:

- Jim Boczek, facility engineer at Continental Tire's Mt. Vernon facility.
- Mike Pappas, vice president, MPC Energy LLC.

From Continental's 2003 Annual Report:

"We continually optimize our processes, products, quality, and product benefits to improve our environmental performance.... Our consideration to the care of the environment goes beyond observing environmental laws and requirements of the authorities."

from staff. The maintenance and engineering managers hold a lot of authority in the plant, so their energy awareness resonates with personnel. Energy practices have been monitored by management walk-thru's, although electronic energy monitoring is on the rise at Continental. Managers collect energy monitoring data for trend analysis more so than for monitoring spot use. There is very little coordination of energy information among Continental's North American plants.

Energy management requires ongoing decision-making. Organizational structures were created to assign tasks and mobilize staff toward certain goals. A suggestion program ensured the continuous infusion of new ideas. An Action Team assigned accountabilities to key staff. An Assignment Log program helped track and prioritize improvement opportunities so that they could be pursued in a strategic fashion.

What were the barriers to implementation, and how were they overcome?

Given the mind-set of the Mt. Vernon facility's management and staff, there was actually little resistance to increased energy management. They thought they were doing a pretty good job at energy cost control, until prospective energy service vendors began to prove otherwise. MPC was selected due to its quality of salesmanship and approach: MPC gives the prospective client a proposal only if MPC thinks it would provide value.

How are results monitored and communicated?

MPC provided an initial process-wide energy inventory to serve as a benchmark for subsequent improvements. Submetering provided windows on energy usage throughout the process. The flow of metering data became a continuous pulse on operations, validating the impact of initial improvements and uncovering new opportunities as they arose. The role of staff coordination cannot be overemphasized. It forced people to see beyond the confines of their traditional job descriptions. Energy improvement at Continental then assumed economic momentum—savings from the initial round of improvements paid for subsequent rounds. This strategy ensured that energy management activities were continually responsive to Continental's overall business performance goals.

What are the tangible results to date (consumption, emissions, financial, etc.)?

Continental's immediate technical energy improvement opportunities included the following:

- Staff had incorrectly assumed that the newest of four boilers was the most efficient, and prioritized this boiler for steam supply. MPC's analysis discovered that this boiler's oxygen control system had been improperly commissioned. Years of fuel waste were avoided when this deficiency was corrected.
- Product yields were enhanced by optimizing humidity levels in the plant. Unprecedented attention to the heating, ventilation, and air conditioning system gave plant operators control over this variable.
- Process time studies led to optimization of steam use (a fuel cost impact) and curing times (a productivity impact).
- With over 2,000 steam traps in place, a system-wide trap repair program provided plenty of easy, no-risk savings.
- An energy procurement protocol reduced the impact of fuel price volatility while capturing locally available alternative energy sources.
- A partnership with Nalco, the water treatment experts, brings two Nalco staff onsite for an entire day each week to monitor and improve steam performance. City water usage at the plant has dropped by approximately 40 percent as a result of projects initiated by the water treatment team.
- Each maintenance supervisor was challenged to fix a quota of air leaks per year. The results allowed the shut-down of at least one continuously-running air compressor.

Continental's first phase of energy savings, accomplished while in active partnership with MPC, included a 22 percent decrease in steam and an 18 percent decrease in natural gas, both on a per-tire basis. Electricity consumed per ton of material decreased by eight percent. After MPC's start-up phase, energy management at Continental shifted to an in-house team that subsequently reduced energy consumption per tire produced by 31 percent from a 1995 baseline. As of January 2005, natural gas consumption for heat and boilers was down 30 percent per ton of product, and electricity consumption was down 14 percent.

Who is the audience for the results?

While corporate attention is more focused on bottom-line performance than on energy details, simple testimony to the Mt. Vernon facility's success is that it remains open with increasing production, while less efficient plants have been closed.

In what way have Best Practices and related U.S. Department of Energy resources contributed to energy management?

The engineering staff find great usefulness in DOE's BestPractices material, particularly the tip sheets.

What are the threats to the durability of the CEM effort, and how are these addressed?

No threats to Continental's energy management are currently perceived.

What remains to be done?

The facility engineer notes that "there's always room for improvement." Lighting upgrades were underway at the beginning of 2005. The Mt. Vernon facility could expand its efforts to hedge energy purchases. A big opportunity awaits Continental if it attempts to replicate Mt. Vernon's successes across related plants.