



“We Did it... So Can You!”

Corporate Energy Management at C&A Floorcoverings

A Corporate Energy Management Case Study
Sponsored by the U.S. Department of Energy, Industrial Technologies Program

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OVERVIEW

Collins & Aikman's (C&A) experience is an opportunity to evaluate successful corporate energy management (CEM) by a mid-sized manufacturer. MSE 2005, a certified national management standard for energy, became a template for an in-house energy management program. At the end of 2004, C&A was close to becoming the first organization to become fully certified per the MSE 2005 standard. As such, C&A has implemented a management system for matching energy efficiency initiatives with business goals. After two years, C&A achieved 10 percent savings on an annual natural gas expenditure of \$824,500.

What was the desired outcome of the CEM effort?

C&A's corporate leadership is keenly aware of the environmental impacts of manufacturing operations. Corporate commitment to energy and environmental stewardship is summarized in a three-part statement of desired outcomes:

- Produce a high quality product using as few virgin raw materials as possible, including energy.
- Produce as few disposable by-products as possible, including direct and indirect emissions from energy usage.
- Lower production costs by using less energy.

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

Although C&A had made significant process in reducing environmental impacts, the company was looking for new solutions to allow further reductions, particularly in the area of energy management. Like many manufacturers, C&A's past efforts to control energy costs took the form of stand-alone projects, undertaken individually, with no serious attempts to document and replicate the results. Energy performance improvements tended to erode over time, because the enabling practices were not committed to operational policy and procedures. In 1999, C&A sought guidance from the Georgia Institute of Technology's Energy and Environmental Management Center. Georgia Tech conducted "third party audits" of two C&A manufacturing plants and introduced C&A to its Management System for Energy, MSE 2005. MSE 2005 is a management standard that merges technical and business criteria for optimizing energy use in response to corporate goals. The MSE 2005 program is accredited by the American National Standards Institute (ANSI) and is based on global management systems developed by the International Organization for Standardization (ISO). It institutes a team-based approach that includes participants from all areas of the organization and incorporates the "Plan-Do-Check-Act" cycle. The management system's formalized structure requires clearly defined responsibilities, documented procedures, ongoing training, internal checks for compliance, corrective and preventative action, management reviews and continual improvements.

What technical, managerial, and behavioral elements were developed?

Work began by assembling an energy-use profile showing sources and uses of energy across all processes. The completed energy-use profile allowed the team to prioritize improvement opportunities according to an overarching energy policy. The team formulated a policy that simultaneously defined desired outcomes and the metrics that indicated success. Specifically, the goal called for reducing natural gas, electricity, and water per unit of product on an annual basis at each plant. With goals and metrics established, the team developed an energy manual, merely nine pages in length, to communicate operational policies for energy and waste minimization. This document is

FACTS & FIGURES:

Collins & Aikman (C&A) Floorcoverings: A member of Tandus, and a major, privately-held manufacturer of commercial carpeting based in Dalton, Georgia. See www.tandus.com.

Scope of operations: Five plants located in the vicinity of Dalton, Georgia. The two largest plants are the yarn & dye plant (162,000 square feet) and the finishing plant (250,000 square feet).

Annual energy use: Annual energy bill of about \$1.7 million in 2001, split evenly between natural gas and electricity. Annual NOx emissions are estimated at 10.6 tons. Energy expenses are on a pace to hit \$2 million in 2004.

Key energy professional: Kent Benson, environmental engineer.

Excerpt from C&A's Mission Statement:

Specific core programs are dedicated to continual improvement and measurement in resource utilization management, air and water quality, energy utilization, and GOAL ZERO programs for waste and emissions.

tailored at the individual plant level to include work instructions and protocol for maintaining performance metrics. Procedural documentation and resulting metrics help to sustain and replicate improvements across multiple sites.

How are empowerment and accountability addressed?

Top-down support fostered the cooperation of plant managers and supervisors. An energy coordinator was appointed and empowered to lead the MSE 2005 process. A cross-cutting team of professionals, drawn from the corporate front office, engineering, maintenance, and purchasing was assembled to implement the standard. Implementation of MSE 2005 also requires an inventory of the related staffing and skill complements. An annual management review meeting allows all stakeholders to evaluate progress so that goals, accountabilities, and procedures can be amended as needed.

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

Energy management at C&A began by soliciting corporate support for the use of MSE 2005 and for approval of the time and accountabilities that this effort would require. Corporate buy-in was predicated on top management's understanding MSE 2005's elements and benefits. Implementation of the MSE 2005 appeared to be a time challenge for busy staff. The energy coordinator was instrumental in assembling input from the MSE 2005 cross-cutting team members. Both the timeline and the selective scope of equipment evaluation were designed to reflect limited time and resources. The implementation was made easier by using an "80/20" rule for analysis, which applied the reasonable assumption that 80 percent of energy consumption is attributed to 20 percent of equipment.

How are results monitored and communicated?

The annual management review meeting is a formal appraisal of MSE 2005's implementation and the results it generates. Annual review ensures that victories are recognized and prioritized for replication. Review also identifies opportunities for corrective action with respect to administering MSE 2005 and the operational procedures that the standard includes. Since documentation is electronic, current procedures and work instructions are available via intranet. When procedural changes impact staffing and skills requirements, the same database identifies training needs for specific operating personnel.

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

C&A achieved a 10 percent reduction in natural gas costs within two years of adopting MSE 2005. Individual process improvements include:

- By reducing the operating temperature of a recycling facility's regenerative thermal oxidizer from 1,525°F to 1,200°F, C&A saved \$9,500 per year on a \$10,000 investment. The temperature reduction was achieved without an increase in emissions liabilities.
- A 55°F decrease in operating temperatures for curing ovens saved \$14,700 per year in natural gas costs and cost virtually nothing to implement. Non-energy benefits included reduced deterioration of equipment thanks to lower operating temperatures.
- As with the curing oven example, operating temperature reductions for thermal oxidizers on a curing range had both energy and non-energy cost benefits. Energy savings alone were \$55,000 per year.

Who is the audience for the results?

Top management reviews energy management results and adjusts strategic direction based on annual reviews. Posters displayed throughout all plants for review by all staff compare actual to baseline energy use. Additionally, C&A tracks and publicly reports its environmental measurements on its web site at www.powerbond.com and through EPA's National Performance Track Program, of which C&A is a charter member.

How do awards and recognition play a part? Internally, the Opportunities for Improvement program encourages employee suggestions in the areas of safety, quality, the environment, and the work-place. Providers of successful suggestions are awarded a certificate or other internal recognition. C&A's Cost Improvement Program requires salaried personnel to submit quarterly suggestions for cost-saving initiatives. This wide-reaching practice covers waste management, vendor selection, purchasing strategies, and other opportunities.

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

Energy management requires collaboration outside traditional chains of command. Without support from top management and the defined accountabilities established under the MSE 2005 energy management standard, utility expense control at C&A would not be nearly as successful.

What remains to be done?

C&A will become the first fully-certified MSE 2005 facility pending the completion of a few outstanding staff training requirements. Certification is granted by third-party approval, a process very similar to ISO 9000 Quality Management attainment.