

Competing With Boundless Energy Efficiency

Although every company is feeling the effects of rising energy costs, some manufacturers have gained competitive advantage by making energy efficiency part of their business strategy. It's a sustainability strategy successfully used by the likes of Johnson Controls, Orion Energy Systems, SKF and Toyota.

Regardless of industry sector, companies are being impacted by energy's growing cost significance. While those rising prices signal the need for greater operating efficiency, management's biggest energy challenge is in recognizing and fulfilling its increasing competitive potential.

For some manufacturers energy efficiency as a competitive strategy has been a management tradition. For example, last year such a reputation led President Bush to select Milwaukee's Johnson Controls Inc. (JCI) as the venue for an energy policy address. (Bush's topic: the growing need for energy independence.)

In addition to recognizing JCI's 1885 origins as a provider of building control technology, Bush also was honoring the company's growing global leadership in supplying building efficiency and power solutions. For example, last quarter, for the first time JCI's revenue from its Building Efficiency operations surpassed revenues from its automotive interiors business. In 2006 Building Efficiency sales totaled \$10.2 billion of the company's overall 2006 sales of \$32.2 billion. Automotive interiors accounted for \$18.3 billion and JCI's Power Solutions (vehicle batteries, including hybrids) brought in \$3.7 billion.

With the recent acquisition of York International, the company's energy-efficient offerings also include HVAC equipment and refrigeration.

The Efficiency Difference

The strategic value of energy efficiency is stressed in the thinking of JCI's John M. Barth, chairman and CEO. Care is taken to point out that the focus of energy efficiency (productivity) is different than conservation (doing without). Barth looks at energy efficiency as an enabler for business and society in terms of creating billions in new capital, increasing innovation and significant job creation.

Actually the value is broader, especially if considered over the lifespan of energy-efficiency projects. How broad? The following is JCI's recap of some of the cumulative lifecycle impact of energy-efficiency projects it implemented between 1990 and 2000:

- Aggregate energy cost savings of \$16.7 billion. The estimate includes electric load reductions equal to 2,500 megawatts (the equivalent of six average-sized power

plants) and electric energy savings enough to power all the households of California for more than two years.

- Carbon dioxide emissions reductions of 217 million tons. That's roughly equivalent to the amount of carbon dioxide removed by planting 650 million trees.

Looking ahead, the company estimates lifecycle energy cost savings of \$21 billion for projects implemented between 2006 and 2025.

JCI is not limiting its energy strategy to the efficiency aspect. "The real opportunity for customers involves combining renewable technologies with innovative energy- efficiency strategies," says Bruno Biasiotta, vice president, solutions.

Examples of JCI's renewable energy implementations include a geothermal heating plant at the Utah Department of Correction. The on-site geothermal well provides building heat for prison cell blocks, a furniture manufacturing shop and a dormitory, says Don Albinger, vice president, renewable energy.

A JCI wind turbine implementation at an Erie, Ill., school district has cut electrical energy purchases by 87%. Other renewable energy implementations installed by the company include a digester gas cogeneration plant in Baltimore and biomass boilers in Indiana. Albinger estimates the boilers will annually consume 1.3 million bushels of corn to pare energy consumption by as much as 6.8 million kilowatt hours each year -- the environmental equivalent of more than 2,800 passenger cars not being driven for one year.

What's ahead? "A fundamental change in energy use considerations is taking place," says C. David Myers, president of JCI's Building Efficiency operating unit. "Every organization is re-evaluating the long-term basis of what its role will be in driving the use of energy down through more efficient utilization. It's an increasing acceptance of business strategies based on sustainability. The evidence is in the growing interaction of legislation, independent consortiums and trade associations. The winners will be those manufacturers who can effectively execute a competitive strategy built on energy efficiency."

Orion's Bright Idea

Large companies like JCI have no monopoly on the success -- or the difficulties -- in pursuing an energy-efficiency-focused business model.

Entrepreneur Neal Verfuert personally made those discoveries in founding Orion Energy Systems in 1996, a startup focused on delivering high-efficiency lighting. His first challenge was to counter the all-too-prevalent conventional wisdom about the energy efficiency of fluorescent systems. Typical prospects, having already progressed from incandescents to high-intensity discharge (HID) lamps, do not readily accept Verfuert's claim of energy savings of 50% or more.

About five years ago that credibility gap was dramatized as he arrived at a sales call. "As I drove in the parking lot, I met a forklift bearing all my sample fixtures with the driver announcing, 'There's no meeting today.'"

Fortunately, Verfuert was able to proceed with the demonstration. The result: "Several months later we won the contracts for all the plants, and today their annual energy savings total \$2 million." Those savings reflect both reduced power use by the lighting system as well as reduced air conditioning heat loads.

Verfuert not only gained a customer, Quad/Graphics Inc., the large, privately held printing company, but today its co-founder, Tom Quadracci, is an Orion shareholder and chairman. What helped convince Quad/Graphics is Orion's proprietary metering system that can indicate real-time energy consumption. A test at a Quad/Graphics plant indicated a 50% reduction in energy usage with a 50% increase in lighting levels.

"Quite frankly, I initially did not expect much from Orion since the memory of switching from fluorescents to HID lighting was still a vivid memory," says Quadracci. "Our initial energy reduction goal was just 20%." Quadracci says the full spectrum capability of the Orion system is an important advantage. "In addition, rethinking our lighting approach keeps 600,000 tons of carbon dioxide out of the atmosphere." He says plants with a total of 9 million square feet of floor space were updated.

Orion also offers the measurement and verification technology as a way to manage peak energy consumption. Orion has installed systems at more than 75 Fortune 500 companies, adds Verfuert.

The Toyota Way

Toyota, known for fuel-efficiency achievements in its vehicle lineup, also concentrates on optimizing energy use across its manufacturing plants. In March, its commitment to process energy efficiency in its 11 U.S. manufacturing plants was again recognized by the Environmental Protection Agency's Energy Star program. Toyota became an Energy Star Partner in 2003 and has continued to receive the annual Energy Star Sustained Excellence Awards, says Bruce Bremer, manager of facility engineering at the Erlanger, Ky.-based Toyota Motor Engineering and Manufacturing North America Inc.

Since 2002 Toyota's North American operations have achieved a 30% per-vehicle decrease in energy consumption, says Bremer. During that period carbon dioxide emissions have dropped 25%, he adds.

Toyota's suppliers benefit, too. For the past year and a half, Toyota has been helping suppliers improve energy efficiency as part of a best practices program. Instead of labeling the efforts as energy audits, Bremer euphemistically labels them as "treasure hunts."

"The treasure hunts are typically two- or three-day events intended to help management target energy kaizen goals for the next 12-month period." Bremer says the treasure hunts are designed to help train the trainers -- those who will direct the continuous-improvement projects.

Bremer says Toyota's painting function represents the biggest opportunity for energy optimization. "Painting takes about 50% of all of the energy that we buy." Other key areas

include lighting-system upgrades and heat recovery with newly developed technologies. "It is important to look at both the [introduction of] new equipment and the ongoing production operations in each plant."

On the process side, Bremer says the biggest challenge comes when the need for energy optimization causes disruptive changes in processes well known for their inherent quality. "Since the processes are otherwise optimized, it becomes a challenge to change while maintaining quality and productivity. We have to appreciate that energy optimization is not always a matter of minor tweaks to an existing process." Toyota's solution: Initiate and optimize the changes in pilot programs, and then scale up.

Click here to read the article at:

<http://www.industryweek.com/ReadArticle.aspx?ArticleID=13964>