

Written by Jane Alexander, Editor with Cassie Quaintance, Schneider Electric  
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**What's not to love? What's not to emulate? This global manufacturer realized \$3.7 million in energy savings in just the first three years of a corporate energy optimization initiative.**



**As a global leader in electrical distribution, monitoring and control equipment, Schneider Electric (Schneider) has helped thousands of customers around the world save money and protect the environment through reduced energy consumption. In 2004, however, the company began an energy optimization project for what was to be its most important customer yet—its own operations.**

Focused primarily on its North American Operating Division, Schneider used its own solutions within 21 of its facilities across the United States, Mexico and Canada. The program set out with an ambitious goal of reducing energy consumption per employee by 10% from 2004 to 2008.

By applying many of its own Square D® brand solutions, as well as those of its affiliate companies such as Juno Lighting Group and TAC, LLC, Schneider successfully has created one of the more energy-efficient manufacturing operations anywhere. Energy savings from 2005 through 2007 totaled more than \$3.7 million. The reduced electrical demand resulted in 30,000 less tons of CO<sub>2</sub> being produced by electric utilities, amounting to a 9% reduction in greenhouse gases. Perhaps most noteworthy, the company's goal of reducing energy consumption per employee by 10% by 2008 was met a full two years ahead of schedule.

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### Front-end analysis

As the first step in the energy optimization project, Schneider turned to its energy analysis and management services known as Square D Total Energy Control. These energy experts examined the energy usage patterns and demands of the company's major North American facilities. After identifying all possible opportunities to improve energy efficiency, they prioritized them based on the initial cost and expected payback period. Projects with the greatest potential savings and quickest payback were among the first to be undertaken. Those projects could be categorized into five areas: heating, compressed air systems, lighting, air conditioning and specific manufacturing processes.

Once projects were initiated at each of the sites, facility managers began reporting new energy usage patterns and the resulting savings on a monthly basis. During quarterly conference calls, energy teams at each of the facilities now share information on new and existing projects. Additionally, they meet in person once a year to discuss best practices that have been established and how they can be replicated companywide.

### Modifying behaviors

The first energy-saving steps recommended by Schneider's in-house experts were also some of the simplest. Often requiring little or no investment, a focus was placed on possible behavioral changes that could reduce consumption at each facility.



For example, project leaders took steps to optimize the heating or cooling temperature within the manufacturing plants. Facility managers regulated temperatures so that they were no warmer than 68 F in the winter and no cooler than 75 F in the summer. Given the size and number of all work areas, keeping room temperatures within the appropriate range was an important part of optimizing the overall efficiency. In fact, fuel consumption increases by 1.5%–2% for every degree of over-heating.

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Other simple behavioral changes that were undertaken included actively shutting down production equipment when not in use, activating computer and monitor energysaving software and reminding staff to shut outside doors or turn off lights when rooms are not in use.

Controlling peak demands was another step that came as a result of the energy usage analysis provided by the Total Energy Control program. By examining each facility's overall consumption and adjusting processes to shed loads and avoid usage peaks, the facilities were able to procure better rates by the utility and, in the end, complete the same amount of work at a lower cost.

The Total Energy Control experts also were helpful in reviewing utility contracts and ensuring that each facility's current demand profile matched its existing contract. Where contracts did not accurately reflect usage patterns, contract renegotiations were initiated, resulting in more favorable rates.



### **Process improvements**

While Schneider's energy-efficiency initiative focused mainly on buildings and their environmental controls, the company's energy teams also looked at major energy users within the manufacturing processes. Insulation levels within paint curing bake ovens were increased. Air compressors used on the manufacturing line were adjusted when possible to use a lower PSI and, as a result, less electricity. All major energy consumption points within the manufacturing process were examined for energy-saving opportunities.

"I think some of the most effective things we've done were related to modifying the manufacturing process," notes Dennis Edwards, manager of facility maintenance for the Schneider North American Operating Division. "In one plant, for example, we were able to eliminate the second shift paint operation. In another plant, we installed a more advanced boiler and changed the painting schedule, which allowed us to shut the boiler down five days a week.

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Those process changes amounted to major savings.”

### **Better monitoring and managing**

Numerous equipment upgrades were undertaken that contributed to the overall energy savings. Among the first were the installation of several Square D PowerLogic® circuit monitors, allowing for up-to-the-minute energy usage and quality readings as well as long-term trending. These monitoring systems let managers set energy usage benchmarks within each facility, make system or process adjustments and track possible savings against the original levels.

Today, more than 180 separate devices in Schneider facilities are using the circuit monitors. This metering is proving critical in identifying demand savings opportunities. In addition, it gives managers the data necessary to verify utility bills and ensure that all energy expenses are accurate.

### **Lighting the way to savings**

High-efficiency lighting fixtures and lighting control also represent significant savings in the project. By leveraging Juno Lighting Group products and its mix of high-efficiency fixtures, Schneider facilities reduced its electricity consumption by more than eight million kilowatt hours over a year's time, resulting in more than \$580,000 in annual savings—and \$196,000 in associated tax benefits.

Rich Widdowson, Schneider's vice president of Safety, Real Estate and Environment, confirms that the lighting portion of the company's energy-efficiency program has been of great importance to the company. “We found that by replacing our high-pressure sodium lights with T8 fluorescent Juno® fixtures, we can cut our consumption in half. We can change a 400-watt light to a 200-watt light without losing anything and improve the quality.”

Besides lowering its electric bill, Schneider's lighting replacement project resulted in another—somewhat unexpected—benefit. Swapping out the higher-wattage yellow lights with lower-wattage, more illuminating white lights was especially well-received by those working in the facilities. As Dennis Edwards put it, this was one of the few programs that he's been involved with as a facility manager where people actually were standing in line asking, “Can you do my area next?” The difference in light color really was significant.

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According to Widdowson, approximately 7000 Juno lighting fixtures were installed. This part of the project alone cut Schneider's North American overall electric bill by more than 4%.

Multiple lighting controls also were installed within the participating facilities, including Square D occupancy and light-level sensors, Clipsal® lighting controls, and PowerLink® branch circuit lighting controls. By integrating this mix of control tools through the PowerLink software, lights are automatically turned on and off using either a predetermined schedule or manual overrides. In either case, the PowerLink system ensures that lights are turned on only when needed and off when they are not.

### **Improving HVAC**

Schneider also set out to reduce the power consumption of the motors used in its HVAC system and manufacturing process by installing its Altivar® brand variable frequency drives (VFDs). Since January 2004, over 50 VFDs were installed at 10 of the company sites. The new drives provide improved control over motor operations and the ability to run at only a percentage of the motor speed, resulting in less power being used in the application.

In addition to improving the HVAC system through VFDs, Schneider sought to fully automate several of its buildings through its TAC brand solution offering. Using TAC building automation software, i/net, the Schneider facilities were able to reduce energy consumption through better building controls. These new systems now allow the facility managers to integrate, control and monitor their HVAC, security, lighting, fire and other building systems through a single comprehensive application. With better control has come greater overall efficiency.

**Establishing An Energy-Efficiency Mindset**

***Building awareness...gaining commitment***

**Dennis Edwards** maintains that helping facility managers to adopt an energy-efficient mindset has been

**"Training is key," Edwards** says. "In many cases, you need to teach your building operators the important

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Being creative—and encouraging creativity—certainly can be part of the educational process that Edwar

### **The payback**

The resulting savings from Schneider Electric's energy initiative have been nothing short of amazing for the company's facility managers and their energy teams. Electricity consumption within the target facilities dropped 9% from 2004 to 2007, despite significant production increases during that same period and sales increasing more than 40% during that three-year window. Since 2004, electrical savings have amounted to more than 35 million kilowatt hours—a savings of more than \$2.55 million.

Schneider's natural gas consumption also decreased 9% from 2004 through 2007. This considerable savings was realized despite the increase in sales, abnormally cold winters and a new painting process requiring a high amount of natural gas that was introduced at several facilities in 2007. The three-year savings totaled more than 106,000 dekatherms—a savings of more than \$1.2 million.

### **Going forward**

In the case of Schneider Electric's corporate energy-efficiency efforts, success really does appear to breed success. Plans now are underway to expand this energy optimization project to include 21 additional Schneider Electric-owned facilities in the next few years—while also continuing at the original project sites.

"It's really a continuous process," Edwards explains. "It's not like you're going to look at an energy action plan, implement a list of projects and then you're done. Technology changes, and there is always something that you can improve. You have to continuously be working in this process, because new things are always coming."

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