

Sysco Portland Inc. reducing energy consumption: 3.6 million kWh since 1995



Customer Need

Sysco Portland, one of many food storage and distribution centers in the Sysco Corp. network, has long been committed to an “earth friendly” approach that emphasizes sustainability and minimal environmental impact. A key part of that commitment has been an effort to continuously reduce its energy consumption, even as its overall facility has gone through major expansions over the years.

Logix Solution

In 1995, Sysco Portland installed a Logix refrigeration control system to manage all of its cold storage rooms and equipment. As the distribution center expanded its cold storage capacity in 1997 and again in 2008, it also expanded and upgraded its Logix control network.

Business Value Delivered

The Logix control system has been a central player helping Sysco Portland to reduce its energy consumption by 3.6 million kWh since 1995, even as it added 98,000 square feet of cold storage space. The Portland facility has consistently ranked among the most energy efficient among more than 100 Sysco distribution centers in the U.S. and Canada. Furthermore, the Logix system’s ability to provide operators with instant visibility into plant operations, long-term trend data for analysis, and precise control of refrigeration equipment has greatly simplified refrigeration management and helped Sysco Portland meet its objective to continually reduce its energy usage.

Controls, Feature Set Critical to Success

The Logix control capabilities and feature-set the system provides are critical elements underlying Sysco Portland’s successes.

Since it went public in 1970, Sysco Corp. has grown into the world's largest supplier of food, food supplies and food equipment. For fiscal 2010, the company reported sales of \$37.2 billion, it employs 46,000 people, distributes more than 400,000 products, and has sales and service relationships with approximately 400,000 customers. These customers include restaurants, nursing homes, hospitals, hotels, motels, schools, colleges, cruise ships, sports parks and even summer camps. To promptly serve their customers' needs Sysco operates out of more than 170 locations throughout the U.S. and Canada, including more than 100 large distribution centers.

Despite being just one part of the large Sysco distribution network, Sysco Portland is a significant business in its own right. Its 390,000 square feet of building space include more than 95,000 square feet of freezer space and more than 40,000 square feet of cooler storage. In addition, the facility has more than 26,000 feet of cooler dock space maintained at a constant 45-degree Fahrenheit temperature. Sysco Portland stocks approximately 13,000 products and, on average, picks 65,000 product "pieces" each day for distribution. The company's fleet of 100 tractor-trailer delivery trucks travels approximately 3.5 million miles each year.

Even as it strives for continued growth and profitability, however, Sysco Portland has some other key objectives. The operation's managers have long pursued an "earth friendly" approach that aims to minimize the environmental impact of Sysco Portland's operations, to promote renewable resources, to encourage sustainable food-growth and



harvesting practices, and to offer its customers eco-friendly food choices. As part of these efforts, Sysco Portland obtains up to 65% of its produce from local farms in peak season, uses biodiesel to fuel its truck fleet, and is constantly looking for ways to improve the energy efficiency of its expansive plant.

In its first major effort to reduce its operation's energy consumption, in 1995 Sysco Portland contracted with Cascade Energy Engineering to analyze its energy usage and to suggest ways in which it could improve energy efficiencies. Cascade, with offices throughout the Northwest, works with a wide range of clients to formulate energy-efficiency strategies and to identify suitable vendors to help achieve the clients' energy objectives.

Among Cascade's recommendations, Sysco Portland implemented several designed to reduce the energy consumption of its large refrigeration plant. These included improved equipment control strategies and installation of variable-frequency drives (VFDs) on freezer evaporator and condenser fans. After interviewing several vendors, Sysco Portland also chose to install a Logix Refrigeration Control System to optimize performance of all the refrigeration efficiency measures adopted.

The comprehensive energy-efficiency project generated immediate benefits: in the year following the 1995 effort, Sysco Portland's energy usage dropped by 1 million kWh, according to Randy Edmiston, facilities director at the Sysco plant. Its success at the time was recognized by Portland General Electric, the company's utility provider, which gave Sysco Portland the "Power Smart Innovator Award" in recognition of its achievement.

Not content to rest on its laurels, Sysco Portland continued to search for new energy-efficient products and operational processes. With the intelligent Logix system as a foundation, the company was able to fine-tune its refrigeration plant even as that plant grew considerably. Sysco Portland went through two major expansions, one in 1997 and another

Intelligent Controls Foundation for Fine-tuning and Reduced Energy

The Logix system helped Sysco Portland fine-tune its refrigeration plant and reduce its energy usage by an additional 2.6 million kWh, even as its cold storage and freezer space expanded by 98,000 square feet.

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Randy Edmiston
Sysco Portland

"Logix has been at the forefront with us in developing some advanced compressor sequencing algorithms that take advantage of the characteristics of VFDs on fans."

Aaron Frechette
Cascade Energy Program and Project Engineer



Sysco Portland Tops in Energy Efficiency Among Peers

The Portland facility has consistently ranked among the 10 most energy efficient of all 108 Sysco distribution centers in the U.S. and Canada.

completed in 2008, and each time upgraded its Logix control system to manage its growing capacity. In combination with other efficiency efforts – such as lighting – the Logix system helped Sysco Portland reduce its energy usage by an additional 2.6 million kWh, even as its cold storage and freezer space expanded by 98,000 square feet above where it stood in 1995.

Although difficult to isolate the exact amount of energy reduction attributable to the Logix system itself, the control capabilities and feature-set the system provides are critical elements underlying Sysco Portland's successes, says Aaron Frechette, program and project engineer at the Cascade consultancy. "A lot of the refrigeration energy savings orbit around the Logix system," he says, explaining that even sophisticated VFDs, evaporators, compressors and condensers won't realize their full energy-saving potential unless they are properly configured and controlled.



To this end, Cascade Energy and Sysco Portland have found the Logix system's ability to provide detailed historical trend data to be particularly valuable. In one instance, for example, the trend data on compressor sequencing indicated that one pair of compressors wasn't working well as a team. Logix and Cascade engineers jointly troubleshot the problem, and worked out a solution to correct it.

"Logix has been at the forefront with us in developing some advanced compressor sequencing algorithms that take advantage of the characteristics of VFDs on fans," Frechette says. "From our observations, we're very pleased with the way these and other Logix controls schemes have worked out."

Beyond the operational optimization that such trend data analysis permits, facilities director Edmiston says the real-time information that the Logix system provides is extremely helpful. "From an operational perspective, it's much easier to receive and understand data using the Logix system, versus doing everything manually," he says. "With the way the Logix graphical user screens are formatted, you can get all the data you need at a glance."

If Edmiston had to pick the Logix features that have most benefited him and his crew, however, it might well be the system's ability to warn of potential problems, combined with a remote notification and system access capability, that lets Edmiston and other operators often correct problems from afar. "I can't stress enough the value of the alarms," he says. "In the past, we'd get calls like 'Man, it's really warm in the freezer.'" Given how long it takes to warm up, that could have meant that we had a problem for two days before somebody actually noticed it."

With the Logix controls, Edmiston is able to set parameter ranges that will generate alarms if temperatures or other variables move outside of spec. "Operationally, we used to have to wait until somebody got to the plant to know if there was a problem," he says. "Now the Logix system calls us at home if something goes outside of our parameters, and we can often can fix it at home. That's huge."

The success of Sysco Portland's many energy-efficiency efforts became especially clear several years ago when Sysco Corp. hired Cascade to perform energy evaluations of its 108 distribution centers, and to then work with each to reduce its energy consumption. At the time, Sysco Corporate also set an objective for all of its distribution centers to reduce their energy usage by at least 5% per year into the future. Since then, Cascade has continued to work with all 108 of the facilities to fine-tune their operations.



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Energy Savings Potential from Equipment Tied to Proper Control Strategies

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Central to Cascade's evaluations is a formula they created to rate and compare the energy efficiencies of different facilities. Developed over several years, and with the support of many customers who provided Cascade with their historical operational data, the formula represents the energy efficiency of each facility by a measure of kilowatt hours consumed per day per 1,000 cubic feet of cold storage. According to Cascade, the efficiency number is then corrected to account for differences in relative volumes of freezer, cooler and dry storage space, plus the application of a Cascade-developed function to correct continuously for ambient average wet bulb temperature. By using its formula, Cascade is able to fairly compare facilities of different sizes and across different geographical regions.

Since the start of the Sysco network evaluation and tune-up project, Cascade has measured the energy efficiency of all 108 distribution centers on a monthly basis. Sysco Portland has consistently ranked among the 10 most energy efficient of all of the plants; in May 2010, for example, Sysco Portland ranked fifth out of the 108 facilities. Sysco Portland was one of the most efficient from the start, and the high ranking is particularly impressive given that some of the other Sysco sites are much newer than Sysco Portland and have more modern equipment.

Through its ongoing efforts, Sysco Portland has been able to maintain its position in the top tier of Sysco's energy efficiency rankings even as its peers have launched aggressive energy reduction initiatives of their own. The margins of difference have narrowed considerably among the top facilities to a point where there's just a few percent difference among the top performers. In fact, the overall energy-efficiency project has sparked friendly – and beneficial – competition among some of the Sysco distribution centers as they strive to one-up each other in the monthly rankings.

Logix and its control systems mesh well with Sysco's effort to continuously reduce energy usage, says Cascade's Frechette. "Logix has been willing to really take a hard look at their system and continually improve it over the years," he says. Nonetheless, Frechette notes, even the best control systems won't reach their full potential unless they're well run and managed by experienced operators. "The personnel at Sysco Portland and at Logix have proven to be a good combination," he says.

Sysco Portland facilities director Edmiston agrees, saying he has received excellent support from Logix across the board, from installation and optimization assistance to ongoing phone support. "It's absolutely been a positive experience, and we've referred them many times to others," he says.

Perhaps the best testimonial, though, has been Sysco Portland's willingness to continue relying upon Logix control systems as it has gone through major plant expansions and as it strives to push its energy efficiency to the limit. These demands might have caused Sysco Portland to consider other refrigeration controls solutions at times, Edmiston admits. "But Logix has never given us reason to shift to anybody else," he concludes.

