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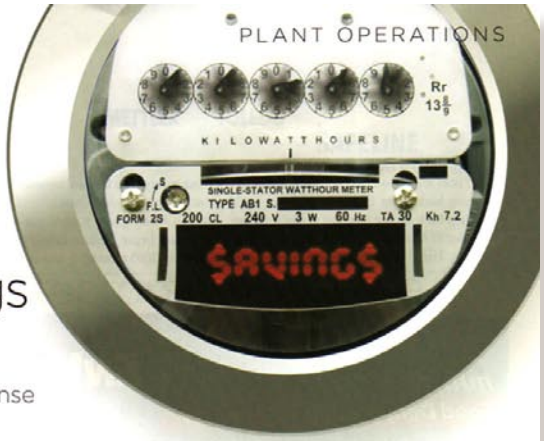

A Can-Do Approach to Energy Savings

Hirzel Canning reduces natural gas and electric costs with incremental, common-sense process improvements.

By Bob Sperber, Plant Operations Editor

Energy cost-cutting is on everyone's mind, but a recession isn't conducive to large capital outlays. An energy-saving program may be even harder for smaller processors, and harder still for ones with seasonal operations.

But if a relatively small tomato canner in Toledo, Ohio, can make a dent in its energy costs, so can you. Following is a look at several ways Hirzel Canning (www.deifratelli.com) trimmed its energy bills despite the seasonality of its operations and overwhelming competition from California vegetable processors.

"Seasonality – that's always hanging over our heads," says Karl Hirzel, director of manufacturing at the family-owned company. "We have some pieces of equipment that only run 40 days out of the year, so traditional return-on-investment calculations and strategies don't always work for us. What works best are small, incremental ways to improve."

Hirzel Canning produces more than 100 tomato products for its Dei Fratelli and Star Cross brands and Silver Fleece sauerkraut from three northwest Ohio locations: a year-round plant at its Toledo (actually suburban Northwood) headquarters and ones in Pemberville and Ottawa that operate from early August to mid-October. Additionally, a storage facility at Ottawa is slated for upgrades that will make it a processing operation.

California's tomato growers, which account for more than 90 percent of the U.S. crop and roughly half the world's supply, affect the little Ohio firm's fortunes as much as any factor – a good crop there can put the squeeze on the Ohio firm. Those are factors certainly outside of Hirzel Canning's control. While the fluctuations of most energy costs also seem beyond the company's grasp, Hirzel Canning has found ways of controlling some of its energy usage.

Partnering for improvements

Hirzel Canning's first energy-saving moves centered on common-sense projects to cut major plant energy hogs. For some of the work, the company looked to outside experts. For example, Hirzel took advantage of energy management services from the local offices of Crescent Electric, a national electrical distributor, that resulted in upgraded lighting fixtures and motion sensors to shut-off lights in low-traffic areas.

Ohio Burner & Boiler Service, Toledo, assisted in tuning and optimizing heat processing and recovery equipment. Help also came from Smith-Boughan Mechanical Services, Lima, Ohio.

There hasn't been a formal full-site energy assessment or audit, although that may be coming as a result of Hirzel's growing relationship with the Edison Center for Innovative Food Technology (www.eisc.org), part of a statewide network supported by universities and the U.S. Environmental Protection Agency. Hirzel Canning's work with the Edison center led to process upgrades including new equipment installations.

Natural gas is a volatile substance, financially speaking. If there was a triggering event that drove Hirzel Canning to take energy saving seriously, 2005's Hurricane Katrina was "the biggest single factor," Hirzel says.

LOOKING TO THE FUTURE

Energy can be saved even before it gets to the plant through smart forward-contracting.

"We're talking about 50 percent savings right now versus contracts that may have been done for a one-year forward term last year, or even Q2 or Q3 of 2008," says Dave Sopko, director of supply origination and structuring for Delta Energy (www.deltaenergyllc.com), a regional natural gas marketer and energy consultancy based in Columbus, Ohio.

Sopko says all food processors should get out of the traditional "box" of buying one-year energy contracts and forgetting about them for the next 10 or 11 months. Current prices, hovering in the range of $5 per million BTUs, may make two-year contracts worth a look.

But when prices are likely to fall, six-month contracts are wiser. Consider how much money companies lost in 2008 if they bought one-year contracts during the spike and ignored the opportunity to sell or renegotiate before prices took a nosedive later in the year.

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Prices spiked to 2.5 times the norm before coming back down in 2006. But "they could go right back up any time just as easily, for any number of reasons," he warns. Like many processors, Hirzel Canning defends against this uncertainty with forward contracting (see sidebar, Looking to the Future.)

To better gauge natural gas demand, the company began tracking hourly usage readings after the 2005 processing season at Toledo, and the following year at the other plants. Now the company knows its usage, which is correlated with the tonnage of product produced. This helps in gas contracting but also helps reduce peak loading plant-wide and in specific areas. Hirzel says this has helped optimize evaporator configurations and better utilize cook kettles.

Hirzel Canning has many energy-intensive operations even though they are used for a brief processing season.

The kettles use large rotary coils that rapidly heat product but also create a large load demand. "By reading that meter every day, every hour, we saw the effects of turning that coil on and opening the valve to let product in," Hirzel says. Valve control and better synchronization of process flows help reduce peak loading.

Throughout its three plants, Hirzel introduced "surges" or intermediate product-holding areas to synchronize production speeds or flows from one step to the next. This smooths production flows as it flattens-out energy demand spikes because equipment can be used at optimal efficiency.

Benchmarking and tracking consumption against product tonnage, Hirzel says "at the two plants where we do our heaviest evaporation, we've reduced natural gas usage 15-20 percent."

It's become a little cheaper to feed Hirzel's gas-fired boiler in the year-round Toledo plant thanks to an economizer. This is essentially a heat exchanger that recovers exhaust gases to preheat feed-water, which is routed to re-heat the boiler, but can be used for other purposes as well. An economizer is planned for the Ottawa plant, as well. However, Hirzel and plant engineers first want to analyze the plant's total heat balance, the level of heat supply and its cost-justification.

The company's falling-film evaporators are another source of energy reduction. While not as intensive as the three- and four-stage evaporators used for tomato paste (which Hirzel does not produce), the company nonetheless has saved energy on its two-stage evaporators by capturing and re-routing heat from the first stage and feeding it to the second. Condensate recovered from the second stage is recycled for cooling systems and other plant water uses.

While Hirzel did not disclose costs, heat and condensate recovery systems vary widely with plant-specific retrofit and custom engineering requirements. According to the U.S. Dept. of Energy, the average plant can save 20 percent on fuel costs related to steam product by using commercially available equipment and maintaining it properly.

Hirzel Canning installed variable-speed drives on as many machines as possible to save energy.

Every day brings new challenges, says Hirzel. Due to fluctuations in agricultural supplies, "There will be days when we have to turn down our lines to two-thirds speed or shut one plant down and move production to another plant." Many of the efforts are little steps, but they add up. Hirzel Canning shows what's good for processing is also good for energy savings.

MORE ON THE WEB

We've done numerous stories on ways to save energy. The most recent was just last month: "Motors' Next Big Act," now at www.FoodProcessing.com/articles/2009/motors.html.

Previous stories include:

"Renovating for Energy Efficiency" (www.FoodProcessing.com/articles/2008/164.html)

"Hormel Cultivates a 'Green' Plant" (www.FoodProcessing.com/articles/2008/342.html)

In fact, searching for "energy" at www.FoodProcessing.com will get you 576 results, including links to EPA and Dept. of Energy resources.