MALTEUROP: MAKING MALT AS EFFICIENTLY AS POSSIBLE

CASE STUDY
MINNESOTA

At Malteurop's malt manufacturing facility in Winona, Minnesota, the goal is to provide the best malt possible for their brewers around the country. The Malteurop Group is the world's leading malt producer, currently producing more than 2,200,000 tons of malt annually for its many global clients.

Customer service is one of Malteurop's top priorities, but others include supporting sustainable agriculture, ensuring food safety and reducing energy and water consumption, while maintaining a safe workplace. They began tackling energy and water efficiency initiatives a few years ago through Xcel Energy's Process Efficiency program and were happy to learn that rebates could help them offset the cost of investing in new, highefficiency equipment.

Making a plan

Making malt involves taking different types of grains from farmers such as wheat, rye and barley, letting the seeds grow by soaking them in water and then drying them over the course of several days. Once the grains are dried, they can ship the malt to brewers. Because there are many steps to the process, there are also many ways to operate more efficiently.

An internal review of the various plant operations' energy usage, along with benchmarking against other Malteurop plants, produced a laundry list of items to complete. For two years, they worked on projects one by one receiving Xcel Energyrebates every step of the way.

"Energy is the main cost in manufacturing so we had a huge opportunity for savings by looking at more efficient equipment," says Brian Arnold, Process Engineer at Malteurop.

These are some of the process efficiency improvements they've made.

Lighting: They replaced 2,000 lights with LEDs in phases. In some rooms, they had to add light switches to be able to turn the lights off. "This was a great improvement because it included automating the system with motion sensors so employees wouldn't have to worry about turning lights on or off.

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> Process Engineer, Malteurop

PROJECT SNAPSHOT	
Projects	Studies and upgrades to lighting, motors, blowers, humidification and dust collection systems
Electric energy savings	4,145,000 kWh
Gas energy savings	87,000 Dth
Xcel Energy rebates	$718,000
Recognition	Energy Partner of the Year Award

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Motors: They replaced 450 horsepower fans that used to run continuously at constant speed with fans that can be turned down when not in use. They also added variable frequency drives (VFDs) on some of the equipment to further reduce energy use.

Blowers: During the steeping process, barley is mixed with water in large tanks. Malteurop uses steeping tanks that use substantially less water than traditional tanks, and air is pumped into the tank to provide oxygen to the process, and remove CO2 from the steeping tanks. "We used to have a big air compressor that we replaced with a blower system, producing air at a reduced pressure. That cut our energy use by two-thirds," Arnold says.

Heat recovery system: Blowing warm air over the malt during the drying process requires a lot of energy. Arnold says the original system from the 1900's, which they rebuilt in 2004, was still the biggest natural gas load in the plant. They invested in a heat recovery system in 2017 which was significantly more effective than their previous system at recovering heat from the process.

Humidification system: During the germination process, a fine mist is sprayed over the grains to maintain constant humidity. Malteurop installed a new misting system that made smaller water droplets to humidify the air more efficiently. They also connected to a city water source which eliminated the need to use pumps to get the water to the misting systems. The new process saves both water and energy.

Dust collection - malt elevator: In the area where malt is moved out of the plant, there are dust collection systems in place. This project decoupled fans, and installed automation and VFDs, thereby reducing run times and fan speed to reduce the energy needed for this process.

The combined efforts were well worth the investments. They are now saving 4,145,000 kWh of electric energy per year, and 87,000 Dth of gas energy per year. They have reduced their water usage by 60 percent. The work also earned them $718,000 in Xcel Energy rebates and an Energy Partner of the Year award.

Next steps

Malteurop isn't finished making improvements. They continue to work on their long list of energy and water efficiency projects, including production improvements, and are considering solar installations in the future.

"Once we near the end of our road map of efficiency projects, then we can invest in solar and other renewable technology," Arnold says.

The Winona location has been a great example of energy efficiency in Malteurop and these successful projects are being shared globally.

For more information about Xcel Energy's Process Efficiency program and qualifications, please visit **xcelenergy.com/ProcessEfficiency**.

With our Process Efficiency rebates, you can:

- Identify new energy-saving opportunities
- Receive thorough reports that define the potential energy savings at your facility to better communicate your facility's efficiency potential to decision-makers
- Boost your bottom line through long-term energy savings
- Receive engineering and technical studies that can lead to 5%-12% energy savings, with a maximum cost to your company of $7,500
- Benefit from rebates for your capital improvements as well as bonuses for achieving energy efficiency goals

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