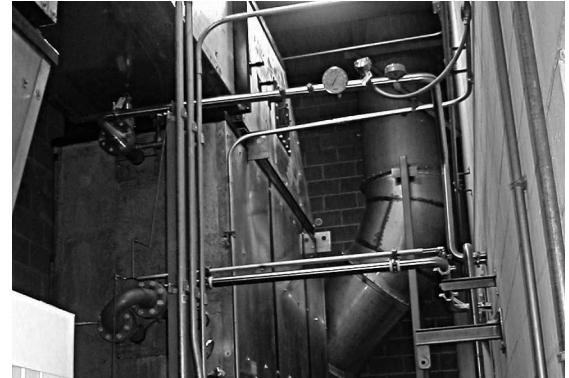


Nestlé USA saves energy with new condensing-economizer system

CASE STUDY

With today's high energy costs, it's no surprise that companies are searching diligently for ways to improve energy efficiency. With a financial incentive from Focus on Energy, Wisconsin's statewide program for energy efficiency and renewable energy, Nestlé USA's infant formula plant in Eau Claire was able to turn what had once been wasted air into daily energy savings of \$550 with the installation of a condensing economizer system. The condensing economizer captures the latent heat from water vapor in the flue gas.



New condensing economizer and exhaust stack.

because it extracts heat that cannot be recovered by a conventional economizer alone. In addition, the system's fan is controlled by a variable-frequency drive (VFD) to optimize energy efficiency. These controls mean the fan only operates when there's a sufficient level of heat to warrant it. Other systems throttle the flow with a damper instead of slowing down the fan.

Net energy savings for the project were 13,500 million Btus, which equals the natural gas savings less the corresponding increase in electricity used by the economizer fan. All estimated savings were based on a conservative average load of 37 percent and are expected to be higher during the heating season. A Focus on Energy Measurement and Verification (M&V) study conducted in April 2006 showed that actual savings were very close to projections.

Nestlé USA first began to investigate installing a condensing economizer system in early 2005. These systems transfer a substantial amount of sensible and latent heat from the hot flue gases to the boiler make-up water. In Nestlé USA's case, the energy is used to pre-heat cold boiler water. Rising natural gas prices—which have jumped by nearly 90 percent since 2001—made the equipment a top priority, and a financial incentive from Focus on Energy meant that system payback was less than three years.

Nestlé USA installed a condensing-economizer system on two water-tube boilers. The condensing economizer was chosen

THE OPPORTUNITY

Many of Nestlé USA's production processes rely on heated water; water comes out of the main at roughly 50 degrees fahrenheit and requires a substantial amount of energy to heat.

Nestlé USA Food Company is headquartered in Vevey, Switzerland and is the world's largest food and beverage company, with 250,000 employees worldwide. The Eau Claire facility is a branch of Nestlé USA, the company's U.S. division. Nestlé USA has worked with Focus on Energy, in partnership with Xcel Energy, since 2002. Efficiency upgrades have been completed at locations throughout Wisconsin including Eau Claire, Hager City, Jefferson, Burlington, and Stoughton. Improvements at the Eau Claire plant alone have saved nearly \$200,000 in energy costs, and this facility received the Governor's Award for Excellence in Energy Efficiency in 2006. This award recognizes the company's efforts to reduce dependence on fossil fuels, stimulate the economy, and preserve the environment.

PROJECT SUMMARY	
Project Cost	\$340,000
Therm Savings	141,864
Energy Savings	\$110,675
Focus Incentive	\$40,386
Energy Payback	2.7 years



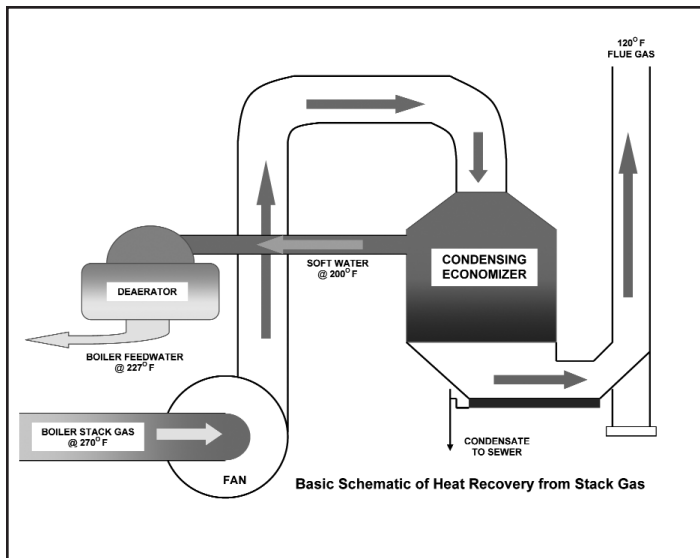


Figure 1: Schematic of a heat flow through condensing economizer system.

The company had considered installing a condensing-economizer system in the past to heat water more efficiently, but relatively low natural gas prices and high equipment costs made the payback period prohibitively long.

THE SOLUTION

Rising natural gas prices meant that it was critical to install more energy-efficient equipment, and the Focus on Energy financial incentive helped tip the purchase decision. Nestlé’s new system has a number of energy-optimizing features including a condensing economizer and a VFD-controlled economizer fan. The system draws hot flue gases from the boiler stacks and recycles it to pre-heat boiler make-up water. “Using the exhaust to pre-heat the make-up water can add as much as 120 degrees of heat—and creates substantial energy savings,” said Ken Williams, Focus on Energy’s business programs director.

PROJECT BENEFITS

“Beyond the huge energy savings, our new condensing economizer system helps our operation run more smoothly with little worry of being able to meet our steam needs,” said Larry Willi, facilities engineer at Nestlé USA.

Pre- and post-installation measurements by Focus on Energy showed an annual savings of nearly 142,000 therms, which is offset somewhat by an increase in electricity use of 208,823 kilowatt-hours (kWh) per year to operate the economizer fan. The net energy savings are 13,500 million Btus per year. Post-installation measurements were taken during April 2006; and system savings are expected to be even higher during the heating season.

The estimated cost to develop and install the economizer was \$340,000 and the project qualified for a \$40,386 Focus on Energy financial incentive. Annual energy savings were estimated at \$110,675 based on a blended rate of \$0.05 per kWh and \$0.80 per therm (which was a two-year cost average at the time). This figure includes the deduction for increased electrical use by the economizer fan.

In addition, the ability to deliver hot water more rapidly to the production process helps to ensure that production flows smoothly. “It’s almost like increasing your boiler capacity,” said Williams.

“The implementation grant from Focus on Energy, along with the presence and support of its energy advisor, helped us move this project to high priority,” said Willi.

HOW CAN FOCUS ON ENERGY HELP YOU?

Looking for ways to improve energy efficiency at your production facility? Focus on Energy can help. Our experienced and knowledgeable industry-specific energy advisors can offer best practice support in a number of areas including project evaluation assistance, measurement, evaluation of savings, financial assistance for stalled projects, training opportunities, tools to manage energy, and third-party reviews. To learn more, call **800.762.7077** or visit **focusonenergy.com**.