Optimizing Your Solar Potential

Dr. Gilad Almogy, CEO, Cogenra Solar

With an uncertain economic climate, processors are now more than ever looking to cut costs and foster long-term financial stability. It’s no surprise that the energy-intensive nature of processing leaves many producers vulnerable to rising electricity and fuel prices. These financial motivators coupled with new environmental guidelines and strict industry regulations are prompting many processors to reassess how to most effectively meet their energy needs. On-site renewable energy installations are an attractive solution for progressive manufacturers looking to take control of their energy future.

Fortunately, technology advancements and generous government incentives have made going green not only an environmentally responsible choice, but also a strategic, cost-saving business move. New financing models tailored for industrial end-users allow processing facilities to integrate renewable energy systems for little or no upfront costs, providing a pay-as-you-go model for onsite energy production that serves as a hedge against volatile utility rates. These models, known as power purchase agreements (PPAs), enable sustainability programs without redirecting capital from core business objectives.

Not all renewable energy technologies are created equal

While most plant managers agree renewable energy could be an effective solution to meet sustainability objectives and improve the bottom line, selecting the right technology can be an exhausting process. There are essentially two fundamental solar technologies available for industrial manufacturers: solar photovoltaic (PV), traditional solar panels that generate electricity, and solar thermal, systems that generate heat for hot water and other processing operations that are typically fueled by burning natural gas. Both solar PV and solar thermal supply a valuable energy resource, so why choose between the two?

Introducing solar cogeneration, renewable heat & electricity

For the processing industry where the demand for process heat often meets or exceeds the demand for electricity, solar cogeneration is the ideal solution. Solar cogeneration combines proven solar PV and solar thermal technologies in a single system to deliver both electricity and hot water. While the electronic component connects to the facility's existing power supply, the thermal end heats water for washing and sanitation, cleaning, pasteurization, fermentation, boiler pre-heating and other practical applications.

The Nitty Gritty — Heating Up with Solar Cogen

By using solar cogeneration, processors reduce a large portion of their natural gas consumption and gain access to clean electricity to sustainably power plant operations. Solar cogen modules are quickly assembled on site and designed to seamlessly integrate with existing hot water boiler equipment. The water is heated through a closed-loop heat exchanger to temperatures around 70° C (160° F), depending on the facility needs, and can be utilized immediately, fed into boilers to be elevated to higher temperatures or temporarily stored and applied during non-sun hours.

Solar cogeneration is the most environmentally responsible solar solution on the market, eliminating greenhouse gas emissions at nearly three times the rate of traditional PV panels while also reducing local VOC (volatile organic compounds) and NOx (Nitric Oxide and Nitrogen Dioxide) emissions released from the onsite burning of natural gas. In some air quality districts, avoidance of VOC and NOx pollutants can obviate regulatory burdens and associated fines.

A Closer Look at Solar Cogen for the Dairy Industry

The U.S. dairy industry has made an aggressive commitment to promote sustainability and identify best practices for processing operations. The energy used for milk pasteurization, packaging and distribution contributes nearly five million metric tons of greenhouse gas emissions nationally each year. In an industry call to action, the Innovation Center for U.S. Dairy announced in January 2009 a voluntary goal to reduce greenhouse gas emissions from the production lifecycle of each gallon of milk by 25 percent by 2020. A partnership with the EPA and the agency's ENERGY STAR program was formed early last year to rally industry participants and determine transitional guidelines to meet this goal.

The industry's energy-intensive cleaning practices, fueled by high-temperature heat, were identified as one area for major improvement. Processing equipment and piping systems in milk plants require frequent cleaning to keep milk fresh and abide by FDA regulations. To meet these standards, the inner surfaces of pasteurization equipment and pipes are cleaned daily and raw milk storage tanks are cleaned every 72 hours. Consequently, more than half of a milk processor's energy consumption is devoted to cleaning equipment and pipes.

The Next Generation Cleaning project was tasked with finding new solutions that lower a processing plant's fuel demands and greenhouse gas emissions. Recently, the Innovation Center recognized solar cogeneration as a viable solution to maintaining the high-temperature cleaning processes without the large carbon footprint and high fuels costs.

"As a leader in the dairy industry and an active member of The Innovation Center for U.S. Dairy, we are always interested in technologies that can help us reduce our impact on the environment and the world around us," explains Howard Depoy, director of power refrigeration and sustainability for LALA USA. "Solar cogeneration could enable us to meet our threefold objective: reduce our carbon footprint and our reliance on fossil fuels, decrease our fuel costs and, of utmost importance, continue to provide our consumers with safe and nutritious dairy products."

Under the Next Generation Cleaning project scope, the Innovation Center will continue to collaborate with Cogenra Solar to determine the impact of solar cogen on the dairy industry at scale.

Solar cogeneration is by far the most efficient and environmentally sustainable solar solution for processors. Supplying two valuable industrial resources — electricity and hot water — solar cogeneration delivers five times the energy output, three times the greenhouse gas reductions and twice the financial savings compared to traditional solar panels.

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For more information on solar cogeneration, visit www.cogenra.com [1] *or visit Cogenra Solar at the California League of Food Processors' Expo & Showcase of Processed Foods in Sacramento, Calif. Feb. 1-2, 2011. Dr. Gilad Almogy will give a presentation on the value of solar cogen on the panel "Solar Energy, Has the Time Come?" on Wednesday, Feb. 2 from 12:00 – 1:00 p.m.*

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