Cogeneration

> **Case History**
Western Milling, USA

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Cummins Power Generation

Where:
Western Milling animal feed facility in Goshen, California, USA

What:
A combined heat and power (CHP) cogeneration system utilizing a 1250 kW lean-burn gas generator

Purpose:
Produce electricity and heat from a single source of energy and parallel with the local utility, helping reduce the facility's energy costs

Primary choice factors:
Local distributor's ability to analyze energy needs and quickly commission a CHP system; seamless power transfer between local utility and on-site power, using PowerCommand® paralleling switchgear

CHP system from Cummins Power Generation Inc. delivers energy solution, economic success and environmental responsibility

GOSHEN, CALIFORNIA, USA — With rates soaring for electricity and natural gas in Southern California, a large animal feed supplier decided it needed to do something to reduce its energy costs. Western Milling, located in Goshen, California, produces a full range of liquid, bagged and bulk animal feed products ranging from organic feeds to food byproducts. It uses large amounts of electricity to run conveyors, mixers, grinders, blenders and pellet mills. In addition, it uses steam and hot water for processing feed and food byproducts.

Cummins Cal Pacific, the local distributor for Cummins Power Generation, analyzed Western Milling's need for more economical energy and recommended a combined heat and power (CHP) cogeneration system running on natural gas. According to Herman Van Niekerk of Cummins Cal Pacific, "CHP systems generally consist of a generator set, heat recovery equipment and control systems. They produce electricity and heat from a single source of energy. Heat produced can be used for space heating/cooling, or for making process hot water, cold water or steam."

This CHP unit from Cummins Power Generation produces 1250 kW of electricity, 2,200 pounds of steam and 30 gal/min of hot water while besting local air quality standards.

Western Milling uses the steam and hot water from its cogeneration system to process animal feed and food by-products.

Niekerk also explained that on-site CHP systems generate electricity about 33 percent more efficiently than central power stations. This is in part because they capture and use nearly all of the heat that central power stations normally lose. The integration of electric and thermal power production with an on-site CHP system can produce savings of up to 35 percent on total energy expenditures.

Cogen system produces electricity and heat, while reducing demand on utility

Western Milling installed a CHP system based on a PowerCommand QSV91G lean-burn natural gas engine generator from Cummins Power Generation. The generator produces 1250 kW of electricity, and the heat recovered from the engine exhaust produces up to 2,200 pounds of steam at 115 psi and 30 gallons per minute of hot water at 190° F. The unit is enclosed in an ISO-style container and located outside the processing facility.

"Every hour the CHP system runs, we save money," says Ejnar Knudsen, executive vice-president, Western Milling.

Knudsen says, "Our processing plant runs 24/7 and we use both electrical and thermal energy to process grains into animal feed." The CHP system was installed and commissioned just 12 weeks after it was ordered, which included working with the local utility on paralleling. "Cummins Cal Pacific and Southern California Edison worked together to resolve all interconnection issues," says Kevin Kruse, chief executive officer, Kruse Investments.

Cummins Cal Pacific's complete turnkey solution included a viability study, system engineering, procurement, permits, construction, single-source warranty, maintenance contracts and round-the-clock automated monitoring systems. The PowerCommand paralleling switchgear facilitates a seamless and redundant supply of electricity between the generator set and the utility, instantly responding to varying load demands.

Meeting California's strict environmental standards

On-site power generating systems in California face the most restricitive environmental standards anywhere in the world. The PowerCommand QSV91G generator set installed at Western Milling is one of the cleanest gas generating sets available today. Without after-treatment, the reciprocating gas engine generator's emissions of NO_X are 111 parts per million by volume (0.85 grams/BHP-hr). However, to meet California's strict air-quality standard of 9 parts per million, Cummins Cal Pacific designed and installed a Selective Catalytic Reduction (SCR) system on the generator set's exhaust that uses a urea injection to reduce the NO_X in the engine's exhaust. After treatment, NO_X in the exhaust stream is reduced to just 5 ppm by volume, half of the amount allowed in the standard.

The CHP system is helping to improve reliability of the electrical service and supply of steam and hot water at Western Milling. With the CHP system operating, the plant can operate on one steam generator, leaving the other one for backup.

For more information about cogeneration power systems or other energy solutions, contact your local Cummins Power Generation distributor or visit www.cumminspower.com/energysolutions.

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