



New Belgium Brewery

290-kW Renewable CHP Application

Project Overview

New Belgium Brewery, located in Fort Collins, Colorado, is the third largest craft brewery and the seventh largest brewery in the nation. They produce over two dozen different beers including “Fat Tire Amber Ale.” The brewery currently produces about 530,000 barrels of beer annually. The beer is distributed to 22 states. The company prides itself on environmental innovation, energy efficiency, conservation, and recycling, striving to make each of these a key component throughout the brewery.

Reasons for CHP

The City of Fort Collins was charging the brewery a large “plant investment fee” for the construction of infrastructure to process all of the brewery’s high-strength wastewater in the municipal water system. Instead, New Belgium took the money they would have had to pay the city and put it towards a process water treatment plant, including anaerobic digestion. New Belgium uses the methane produced by the digester to generate renewable electricity and heat.

In addition, New Belgium saw renewable biogas-fueled CHP as a way to be more environmentally sustainable. “We do subscribe to wind power, but any time we can diversify our energy supply, and even better, produce our own power, that’s a more optimal situation,” said Brandon Weaver, head treatment plant technician at New Belgium.

While wastewater cost savings and renewable energy production were the primary drivers, energy cost savings were another. New Belgium and other similar businesses in Fort Collins pay not only an energy use charge (\$0.03 per kWh) and a fixed demand charge (\$4.399 per kW for the first 750 kW and \$3.012 thereafter) but also a coincident peak demand charge (\$13.3722 per kW). The coincident peak demand is the amount of power New Belgium is using at the time when Platte River Power Authority (Fort Collins Utilities’ generation and transmission supplier) hits its system-wide peak. The energy cost savings of \$5,000 per month are mainly from cutting the coincident peak demand.

Quick Facts

- TOTAL PROJECT COST:** \$13 million (including the original process water treatment plant and capacity upgrade)
- MONTHLY ENERGY BILL SAVINGS:** \$6,300
- EQUIPMENT:** 290-kW engine with heat recovery from Continental Energy Systems
- FUEL:** Biogas produced from the brewing process wastewater and autolyzed yeast
- FACILITY SIZE:** 200,000 sq feet, 325 employees
- FACILITY PEAK LOAD:** 1400 kW
- FACILITY AVERAGE LOAD:** 800 kW
- CHP IN OPERATION SINCE:** 2003



New Belgium Brewery’s facility in Fort Collins, Colorado

CHP System Equipment & Configuration



290-kW engine retrofitted to run on biogas, from Belgium-based Continental Energy Systems

The cogeneration system is a 290-kW engine with heat recovery from Belgium-based Continental Energy Systems. The system was provided as part of the first phase of New Belgium's process water treatment plant designed and built by a German company Von Nordenskjold. The engine is fueled by biogas from the brewery's process water treatment plant, but it is capable of running on natural gas as well. The biogas is not scrubbed, but its moisture is removed before use. This drying is achieved simply through a series of drop legs located on both ends of the pipeline.

The recovered heat is used to heat the wastewater leaving the brewery to assist in maintaining a target temperature of 35 degrees C in the digester. In the summer, the digester can't use all the waste heat from the cogen, and New Belgium is looking into other ways to use the excess heat.

CHP Operation

- The cogen runs 10–15 hours per day, depending on the amount of available biogas and the time of day.
- The cogen system is set to start up when the methane storage balloon nears 100% capacity and “burns down” until the volume is at 20%.
- Strategic programming is also in place to assure the cogen is running during the utility's peak loads
- New Belgium has the capability of feeding power back to the Fort Collins grid but very rarely generates more than the brewery is consuming.
- New Belgium staff performs all required maintenance on the unit.
- In 2007, Woodward Governor provided a new control package which it consistently and with many more engine safeguards in place.



New Belgium Brewery's 225,000 gallons/day process water treatment plant with anaerobic and aerobic digestion

For More Information

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New Belgium Brewery says it would highly recommend cogeneration to other regional businesses. “Creating energy from our process water treatment plant is great because the fuel is created by a waste product. If you have the ability to use a free fuel source, it makes sense to take advantage of it.”

*– Jenn Orgolini, Sustainability Director,
New Belgium Brewing Company*