



# New Belgium Brewing Company

## 760-kW Biogas CHP System



New Belgium Brewery's two dozen craft beers are brewed with the support of a CHP system fueled by organic waste from the brewing process—saving costs and improving sustainability.

### Quick Facts

**LOCATION:** Fort Collins, Colorado

**MARKET SECTOR:** Breweries

**FACILITY SIZE:** 200,000 sq feet, 670 employees

**FACILITY PEAK LOAD:** 1,400 kilowatts (kW)

**TOTAL PROJECT COST:** \$12 million (including the original process water treatment plant and capacity upgrade)

**ANNUAL ELECTRICITY COST SAVINGS:**  
\$100,000–\$130,000

**EQUIPMENT:** 264 kW and 500 kW Guascor engines with heat recovery from Continental Energy Systems

**FUEL:** Biogas from onsite treatment of brewing process wastewater

**CHP IN OPERATION SINCE:** 2003

### Site Description

New Belgium Brewing Company, located in Fort Collins, Colorado, is the fourth largest craft brewery and the seventh largest brewery in the nation. It produces over two dozen different beers including the popular “Fat Tire Amber Ale.” The brewery currently produces about 960,000 barrels of beer annually. The beer is distributed to 39 states and growing. 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” (PIF) for the construction of infrastructure to process all of the brewery’s high-strength wastewater in the municipal water system. New Belgium took the money it would have had to pay the city for the PIFs and invested in a 225,000 gallons/day onsite process water treatment plant, including anaerobic digestion. New Belgium uses the methane produced by the digester to generate renewable electricity and heat in a combined heat and power (CHP) system.

In addition, New Belgium saw renewable biogas-fueled CHP as a way to be more environmentally sustainable. New Belgium has developed an internal energy tax, through which the organization taxes itself on its energy usage, using the funds to implement energy efficiency and onsite renewable energy projects on its campus. The brewery currently produces roughly 20% of its annual electricity needs onsite from biogas and photovoltaics.

Energy cost savings were another driver for CHP. New Belgium and other similar businesses in Fort Collins pay not only an energy use charge and a fixed demand charge, but also a coincident peak demand charge, which applies when Platte River Power Authority (Fort Collins Utilities' generation and transmission supplier) hits its system-wide peak. The electricity cost savings are largely from reducing the brewery's coincident peak demand charges, and these savings vary greatly from month to month.

## CHP System Equipment & Configuration

The first phase of New Belgium's CHP system was a 264-kW engine with heat recovery, initially located within the Brewhouse and at the brewery's process water treatment plant. The engine was manufactured by Guascor, and the system was designed by a Belgium-based Continental Energy Systems. The engine is fueled by the methane-rich biogas from the brewery's process water treatment plant.

The second phase of New Belgium's system is a 500-kW Guascor engine, located adjacent to the Brewhouse. This second engine, too, is fueled by biogas. Natural gas is used to start up and shut down the engine to mitigate corrosion risk from methane. The engine is programmed to react to coincident peak notifications, and operates approximately 12 hours per day. Heat generated by the engine is transferred into a hot process water storage tank, which provides water for the brewing process. At the same time that the 500-kW engine was installed, the brewery added a second methane storage balloon to the process water treatment plant, expanding the brewery's methane storage capacity.



"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, says Jenn Vervier, Sustainability Director for New Belgium Brewing Company. Above: the brewery's process water treatment plant with anaerobic digestion. Below: One of two engines fueled by biogas from the water treatment plant.

## CHP Operation

The CHP system runs 10 to 15 hours per day, depending on the amount of available biogas and the time of day. It is set to start up when the methane storage balloon nears 100 percent capacity and continues to operate until the methane volume is at 20 percent. Strategic programming is also in place to assure the CHP is running during the utility's peak loads. New Belgium staff performs all required maintenance on the unit. Colorado-based Woodward Governor provided a control package for the CHP system, which has allowed for more consistency of operation.

## For More Information

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DATE UPDATED: 2015