

U.S. DOE



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

MillerCoors

20-MW CHP System

Site Description

The MillerCoors brewery in Golden, Colorado is the largest single-site brewery in the world. Opened in 1873, the brewery now produces approximately 1.5 million gallons of beer per day, with brands including Coors Banquet, Coors Light, Miller Genuine Draft, Miller Light, Blue Moon, and George Killian's Irish Red Lager.

The Golden brewery has been using CHP since the 1930s—before the end of prohibition. The brewery's onsite combined heat and power system is now owned and operated by GDF Suez Energy North America, which sells the energy produced to MillerCoors.

Reasons for CHP

The Golden plant is a very large brewery, and its thermal and electrical demands are stable and predictable, making it an attractive application for CHP. CHP results in much lower energy costs compared to buying electricity from the grid and producing steam separately on-site. The brewery originally installed CHP in the 1930s for self-sufficiency and better asset management.

Quick Facts

LOCATION: Golden, Colorado

MARKET SECTOR: Breweries

BREWERY SIZE: 1,600 acres

BREWERY PEAK LOAD: ~47 MW

CHP IN OPERATION SINCE: 1930s

EQUIPMENT: GE dual extraction steam turbines
CAPACITY: 20 MW electrical plus additional 20 MW peaking capability; 1.2 MPPH steam

USE OF THERMAL ENERGY: Process steam for brewery heating and refrigeration equipment and for Colorado School of Mines

PRIMARY FUEL: Coal and natural gas

ENVIRONMENTAL BENEFITS: Reduces annual emissions by 250,000 tons of carbon dioxide, 125 tons of NO_x, & 900 tons of SO₂



The MillerCoors Brewery in Golden, Colorado, the largest single-site brewery in the world, has used CHP since the 1930s for cost savings and cost management

CHP System Equipment & Configuration

The energy production assets include:

- One coal-fired boiler, being converted in 2015 to burn coal or natural gas
- Three natural gas-fired boilers
- Two 10-megawatt dual-extraction turbine generators
- One 20-megawatt single-extraction turbine generator (non-CHP, for peaking purposes)

The boiler steam is supplied to a common 800-psig steam header averaging 750,000 pounds per hour. The superheated steam is directly piped to three turbine generators with a total capacity of 40 megawatts (MW). The dual extraction turbines exhaust 400-psi medium-pressure and 50 psi low-pressure steam for process heating needs of the brewery and the can plant. The single stage turbine only produces electricity and condensate (no process steam). Medium-pressure (400 psi) steam is used mainly for steam-driven chillers, which exhaust to the low pressure steam system. Low-pressure steam is used in various processes including brewing, malting, container manufacturing, and domestic heating and cooling at The Colorado School of Mines.

MillerCoors finds it beneficial to have the flexibility of burning either coal or natural gas at their facility. Following a 2013 agreement that the facility would burn no more than 60 percent coal, MillerCoors has maintained its natural gas use at about 40 percent of the total energy use, helping to reduce environmental impacts.

CHP Operation

- The CHP system generates 20 MW of base load electricity which is a little less than half of the brewery's peak load.
- The system is operational 24 hours per day, 7 days per week.
- Control systems have been upgraded to increase efficiencies and add real-time data gathering.
- The boilers typically burn about 60% coal and 40% natural gas.
- Downtime is minimized by shifting to natural gas fired boilers for scheduled maintenance on the coal-fired boiler.
- GDF Suez handles all maintenance in-house.

"We have the most efficient energy-producing system in the brewery network because of cogeneration."

**— Julie Smith
Miller Coors Energy Manager**

Asset Ownership

The CHP system was originally installed, owned, and operated by Coors Brewing Company. In 1995 a joint venture of Trigen Energy Corporation and Nations Energy (a subsidiary of Tucson Electric) acquired the energy production assets in Golden. The agreement with Coors includes a long-term contract for the joint venture to produce on-site energy and ensure MillerCoors a reliable supply of steam and electricity. In 1998, Trigen acquired all but 1% of the joint venture. Trigen is now a wholly owned subsidiary of GDF Suez.

For More Information

U.S. DOE SOUTHWEST CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)
Christine Brinker, Director
720-939-8333
cbrinker@swenergy.org

MILLERCOORS BREWERY
Julie Smith, Energy Manager
303-277-5630
julie.smith@millercoors.com

SUEZ ENERGY NORTH AMERICA,
COLORADO-GOLDEN ENERGY CORPORATION
Dennis Capps
303-277-5449
dcapps@tpicolorado.com
www.suezenergyna.com

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