



Columbia Energy Center

455 MW Combined Cycle CHP Plant

Project Overview

LS Power is a developer and operator of power-generating sites that purchased the Columbia Energy Center from Calpine Corporation in 2014. The Columbia Energy Center in Gaston, SC operates a 606 MW combined cycle power plant with CHP. It went online in May 2004, providing power to the local utility and steam to a nearby chemical plant.

Two General Electric gas-fired combustion turbines provide 171 MW each. The heat is then recovered by two heat recovery steam generators, which provide steam to one steam turbine. The heat from the turbine is then exhausted to provide steam at 1 million lbs/hr to DAK Americas, one of the largest integrated producers of PET resins in the world and the main producer of polyester staple fibers in the Americas. LS Power sells the steam to DAK under a long-term contract expiring in 2024.

Reasons for Installing CHP

In the late 1990s Eastman Chemical, the first owner of the chemical plant, began searching for more efficient sources of energy. Preferring to focus on their core business and not electricity generation at the specific site, the company initiated talks with potential energy providers. In October 2000 Eastman partnered with SkyGen Energy LLC, which was acquired by Calpine shortly thereafter, to build the Columbia Energy Center. Purchasing steam from the center allowed the chemical plant to retire several old coal fired boilers.

Current fuel efficient technologies demonstrate that power companies can generate electricity reliably while dramatically decreasing emissions and conserving natural resources. Combined cycle power plants that employ CHP reach higher operating efficiencies and further reduce emissions. LS Power operates several electricity generating facilities fueled by natural gas throughout the US.

Quick Facts

LOCATION: Gaston, South Carolina

MARKET SECTOR: Power Generation

IN OPERATION SINCE: May 2004

MAX GENERATING CAPACITY: 606 MW

THERMAL OUTPUT: 1 million lbs/hr

FUEL: Natural Gas

EQUIPMENT: (2) GE combustion turbines

(1) Toshiba steam turbine

(2) Nooter/Eriksen Heat Recovery

Steam Generators

USE OF THERMAL ENERGY: Sold to adjacent chemical plant

USE OF ELECTRICAL ENERGY: Sold to wholesale market

ENVIRONMENTAL BENEFITS: Reduced carbon dioxide emissions by 142,000 tons per year



Columbia Energy Center during construction

Equipment and Configuration

Equipment

- Two GE 7FA Gas Turbines (171.7 MW each)
- Two Nooter/Eriksen Heat Recovery Steam Generators
- One Toshiba Steam Turbine

Operation

Electricity is generated by the two natural gas fueled combustion turbines, while their hot exhaust is utilized in two heat recovery steam generators. The generated steam drives a steam turbine that produces additional electricity to be sold to the grid. Heat from the turbine is also exhausted to generate steam that is then piped to DAK's plant for use in their manufacturing processes. With an operating efficiency of around 54%, the CHP system at the Columbia Energy Center needs about 31% less fuel than typical separate onsite thermal generation and purchased electricity.

The combustion turbines installed in the energy center have combustors that produce very low NO_x and CO emissions, further reducing total system emissions. Specifically, the installed combustor produces less than 9 ppm NO_x and CO, thereby minimizing the need for exhaust clean up systems.



Columbia Energy Center's entrance

Economic Impact

Throughout the construction process, the plant had a large economic impact on the region. Over \$41 million was spent in salaries for 650 employees, \$90 million on construction materials with the majority purchased from local vendors, and \$18 million on subcontractors and other miscellaneous services like surveying, permitting and housing. In addition to the Columbia Energy Center, LS Power operates the 98 MW Cherokee Energy Center in Gaffney, SC. Combined, the two plants put out more than 700 MW and represent a significant investment in South Carolina.

Additional Facts

- The Columbia Energy Center created more than 200 new jobs during construction and now employs 25 people full time.
- The site has reduced carbon dioxide emissions by 142,000 tons per year.
- In 2008, the plant won an EPA Energy Star CHP award.
- At 54% operating efficiency, this plant is approximately 10% more efficient than other generators in the state.

For More Information

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