SOUTHEAST

CHP TECHNICAL ASSISTANCE PARTNERSHIPS

PROJECT PROFILE

Eight Flags Energy CHP Plant

20 MW Utility CHP System / Pulp & Paper Facility Partnership

Project Overview

In 2010, Florida Public Utilities Company (FPU) faced electric rates that were 50% higher than 2007 prices. In order to better serve its customers, FPU derived a solution to stabilize electric rates by establishing a partnership with Rayonier Performance Fiber in Fernandina Beach, Florida to develop a combined heat and power (CHP) system. The new system will augment Rayonier's existing CHP plant's steam production. Combined, the two systems will produce the entire thermal load of the mill and more than 100% of its electric demand. Rayonier will sell the excess electric power from their CHP plant to FPU for distribution to the utility's 16,000 customers on Amelia Island.

FPU's parent company, Chesapeake Utilities Corporation, formed a new subsidiary, Eight Flags Energy, LLC to build, operate and maintain the CHP plant. The plant, which is scheduled to be completed in 2016, will be built on property adjacent to and owned by Rayonier Performance Fibers.

Reasons for Installing CHP

Florida Public Utility Company provides electric service to approximately 31,000 customers in two distinct areas: 16,006 customers on Amelia Island and 15,155 customers in Marianna, Florida. The company currently does not own any generation facilities and relies on a wholesale power contract with the City of Jacksonville's utility, JEA, as its main source of electricity. Additional sources of power include two local Qualifying Facilities: Rayonier and RockTenn. The Eight Flags Energy CHP Plant will also be a PURPA Qualifying Facility providing baseload power that will reduce the overall cost and increase the reliability of electricity for FPU's retail customers on Amelia Island. The CHP system is expected to reduce CO, NOx, VOC, and SO_2 emissions compared to the current purchased power as it will be offsetting coal generation resources.

Quick Facts

LOCATION: Fernandina Beach, Florida
MARKET SECTOR: Utility / Pulp and Paper
EXPECTED OPERATION DATE: July 2016
FUEL: Natural Gas
GENERATING CAPACITY: 20 MW
THERMAL OUTPUT: up to 200,000 lb/hr steam
EQUIPMENT: Solar Turbines Titan 250
Rentech HRSG
Duct burner
800 ton inlet air chiller
USE OF THERMAL ENERGY: Rayonier's process steam and hot water
USE OF ELECTRICAL ENERGY: Distribution to Florida Public Utility Customers
ECONOMIC BENEFITS: $28 million in NPV savings to rate payers over 20 years
EMISSIONS REDUCTION: NOx: 165 tons/yr
SO_2: 105 tons/yr
CO_2: 160,000 tons/yr
CHP PLANT EFFICIENCY: ~ 75%

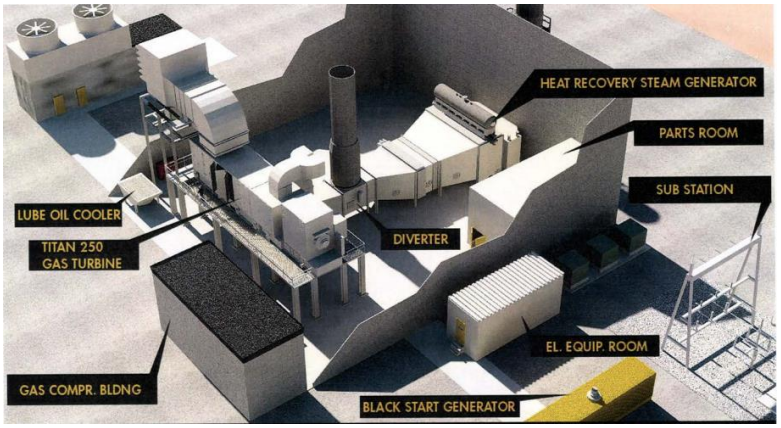
Model of the CHP Plant, Expected to be Completed In 2016

Equipment and Configuration

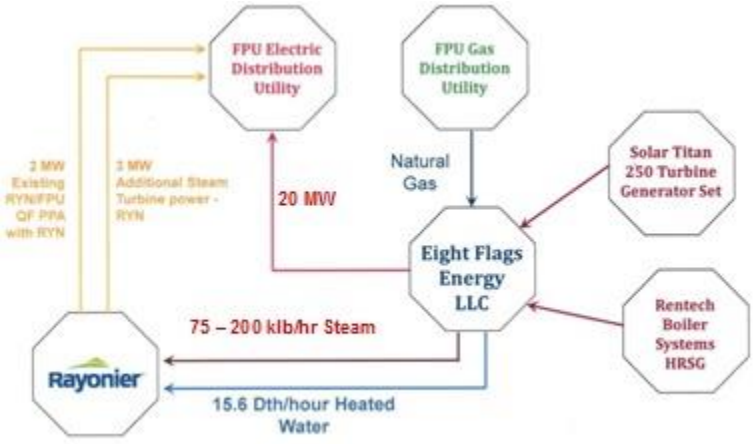
The CHP system is based on a Solar Turbines Titan 250 gas turbine coupled to a Rentech HRSG with a duct burner capable of producing 75,000 lb/hr without supplemental firing and up to 200,000 lb/hr with supplemental firing. The steam is sent to the Rayonier facility through a 500 foot steam line to augment the existing 150 psig steam. This steam will displace the steam currently extracted from the turbine, and will allow Rayonier to either condense this displaced steam to produce up to an additional 3 MW for export to FPU or increase pulp production in the future.

The Eight Flags combustion turbine will be equipped with inlet air cooling to increase electric output during summer months. An 800 ton chiller will provide cooling for both the inlet air and the lubrication oil. Overall, the CHP system will be 80% efficient (HHV) and will operate at greater than 94% capacity factor.

This project was made possible by a new natural gas pipeline put in place by TECO and FPU. In 2012, FPU announced the 33 mile natural gas pipeline from Jacksonville to Amelia Island to serve the community. FPU will provide natural gas to the Eight Flags CHP system from natural gas transported to the site through this new pipeline.



CHP System Model and Major Components



Eight Flags Energy Partnership Structure

Reliability

The addition of the Eight Flags facility on Amelia Island will provide 50% of the island electricity requirements and will improve reliability and emergency power. The system will be designed to handle a class 3 storm surge with the gas turbine, switchgear and auxiliary equipment elevated 10 feet above grade. The single combustion turbine will be capable of supporting essential services on Amelia Island such as hospital, fire, police, water and sewer following a storm.

CHP as a Cost Effective Energy Resource

FPU estimates that the projected all-in cost of power from JEA in 2016 will be $95.40/MWh while for the Eight Flags facility the cost will be $84.30/MWh. Savings are projected each year and overall the agreement is projected to have a NPV savings of $28 million.

For More Information

U.S. DOE SOUTHEAST COMBINED HEAT AND POWER TECHNICAL ASSISTANCE PARTNERSHIP

CHESAPEAKE UTILITIES CORPORATION
Eight Flags Energy
http://www.chpk.com/eight-flags-energy/

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