MID-ATLANTIC CHP TECHNICAL ASSISTANCE PARTNERSHIPS

PROJECT PROFILE

HP Hood LLC

14.5 MW CHP System

Site Description

HP Hood Winchester, Virginia

SOURCE: HP HOOD

Quick Facts

LOCATION: Winchester, Virginia

MARKET SECTOR: Food Processing

FACILITY PEAK LOAD: 15 Megawatts (MW)

EQUIPMENT: 14.5 MW gas turbine, HRSG, and absorption chiller

FUEL: Natural gas

USE OF THERMAL ENERGY: Steam for building, process heat, process cooling, and anerobic digestion

CHP SYSTEM COST: $24,000,000

ENERGY INTENSITY: Improved energy intensity (MMBtu consumed per product unit) by 24%

ENVIRONMENTAL BENEFITS: Reduced total CO_2 emissions by 30%

YEARLY ENERGY SAVINGS: Gross cost savings are 28-30%

PAYBACK PERIOD: HP Hood realized instant savings through a PPA with ZF Energy Development

CHP IN OPERATION SINCE: 2015

For more than 170 years, the name Hood® has been synonymous with fresh, quality dairy products that taste great. Founded in 1846 in Charlestown, Massachusetts, by Harvey Perley Hood, the company has since extended its New England roots, and today Hood is a national company distributing dairy products throughout the United States. In fact, HP Hood LLC is now one of the country's largest branded food and beverage companies with 13 manufacturing plants throughout the United States. Their facilities require systems that provide precise temperature and pressure control and reliable power for its operations. To reduce operating costs, HP Hood LLC implemented an energy management and cost-reduction system in its Winchester, Virginia, facility which included a 14.5 MW CHP plant. The CHP system powers the dairy plant, ensures reliability, improves energy efficiency, reduces emissions, and reduces costs for the Winchester campus, which manufactures and packages fluid dairy and non-dairy aseptic, Ultra High Temperature (UHT), and Extended Shelf Life (ESL) beverages.

Reasons for CHP

HP Hood's primary concern was resiliency since even a short loss of power requires the plant to shut down for up to 12 hours to re-sterilize its equipment. The prospect of lost income due to production disruption was a compelling reason to install the CHP enabled microgrid. HP Hood was also driven by the prospect of cutting costs through the reduction in energy costs and the opportunity to generate additional income by selling ancillary services into the PJM Interconnection's wholesale power market.

CHP Equipment and Configuration

14.5 MW Packaged CHP System
SOURCE: ZF ENERGY DEVELOPMENT

The CHP plant incorporated a 14.5 MW Solar Titan 130 combustion turbine and two 30,000 lb. heat recovery steam generators (HRSGs). A 600-ton hot water driven absorption chiller is currently being installed. The project also included a new 13.2 kV substation that gave the facility the ability to operate in island mode.

Part of the design considerations for this project was creating the interconnection to allow Hood to sell excess power back to the grid through PJM. The project developer, ZF Energy Development, is a PJM member, and has fully automated the process for when to operate the plant so that excess power can be sold at a profit. This also allowed Hood to operate the plant such that its capacity and transmission charges from the utility are almost zero, resulting in significant cost savings for Hood.

By connecting the dairy facility to the wholesale power market through its microgrid controller, Hood is able to tap into revenue opportunities, in addition to energy savings. These opportunities flow from the flexibility to operate in several different configurations. The microgrid normally runs in parallel with the grid, matching generation to the facility's load. When energy pricing conditions are favorable, Hood can then ramp up output from its Solar Turbine generator, allowing the system to export power. That flexibility also provides the advantage that when the grid fails, the facility can keep running via its own onsite power. Also, if the CHP system needs to be shut down for required maintenance on the turbine, the facility can run operations on grid power, avoiding any production interruption.

Hood isn't stopping there, with plans to bring further sophistication to its energy plant by transforming it from a cogeneration (heat and power) to a tri-generation (heat, power, and cooling) facility. This means that in addition to creating heat and power, the microgrid will produce refrigeration with waste heat and an absorption chiller. Hood plans to finish installation of the trigeneration project, which includes the 600-ton absorption chiller, by year's end.

"We're in business to make milk. But to make milk as efficiently as possible, we had a lot to gain from upgrading our energy system. Washington Gas and ZF Energy Development were trusted partners in developing our CHP system. They were able to meet an accelerated development timeline to enhance our existing natural gas service necessary for CHP while at the same time, allowed us to remain operational during construction of the project."

Dennis McNutt, Former HP Hood Utility Manager

For More Information

U.S. DOE MID-ATLANTIC CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)

Solar Turbines is a Recognized Packager in the U.S. DOE Packaged CHP Systems eCatalog:
chp.ecatalog.ornl.gov

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