CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

PROJECT PROFILE

AmericInn Lodge & Suites Rexburg, Idaho

38-kW Micro-CHP System

Quick Facts

LOCATION: Rexburg, Idaho
MARKET SECTOR: Hospitality
FACILITY SIZE: 65 guest rooms
FACILITY Total Electrical Energy Use: 475,000 kWh/year
EQUIPMENT: 2-19 kW reciprocating engines
FUEL: Natural gas-fired
USE OF THERMAL ENERGY: Space, domestic hot water and pool heating
CHP TOTAL EFFICIENCY: About 83% at full-load. Meets 100% of thermal loads and 37% of site electrical loads
TOTAL PROJECT COST: $140,000
YEARLY ENERGY SAVINGS: $9,622
PAYBACK: About 8.3 years with incentives and avoided equipment costs included
CHP IN OPERATION SINCE: July, 2015

Site Description

Just 90 minutes from Yellowstone National Park, Wyndham's 35,000 square foot AmericInn-Rexburg lodge is comprised of 65-rooms. The complex features a large indoor pool and hot tub, a 1,500-square-foot conference room, business center, fitness center, and several themed guest rooms. The facility is popular with outdoor enthusiasts due to its proximity to the many parks, lakes, and mountains in the area.

Reasons for CHP

In 2014, the site's three 400,000 Btu/hour condensing hot water boilers providing heat to the lodge were leaking water and barely able to keep up with thermal demands at the inn. The lodge management contacted Highland West Energy, a turnkey CHP provider located in Rexburg, Idaho. Highland West referred the inn to the Northwest CHP TAP for a CHP feasibility screening assessment, to estimate how much the inn might save by installing a CHP system. The lodge had goals of reducing its energy costs and also improving power supply reliability. With a year-around heated pool, the site exhibited continuous concurrent thermal and electrical loads.

The CHP TAP examined annual electrical energy and natural gas purchases and costs and determined that the site had the potential for a cost-effective micro-CHP project. The old boilers were ultimately removed and replaced with two 19 kW EC Power (Lochinvar) XRGI reciprocating engines. A Noritz in-line water heater was installed for redundancy with three 120 gallon buffer storage tanks included to accommodate peak thermal demands.

CHP Equipment & Configuration

The $140,000 micro-CHP project resulted in $25,000 in avoided boiler replacement costs and the project also received a one-time $35,000 incentive from Highland West Energy. Power output of the two reciprocating engines was derated by 19% to account for Rexburg's 4,865 foot elevation.

One of two 19 kW EC Power (Lochinvar) XRGI® Natural Gas-Fueled Reciprocating Engines and Engine in Sound-Proof Enclosure

CHP Design, Installation, and Operation

A CHP equipment distributor was retained to provide a turnkey project, including engineering, project design, equipment supply and construction for the new CHP system. The project included upgrading the site's electrical system and required plumbing changes to the hot water system to accommodate the new backup water heater and 300 gallons of buffer hot water storage tanks. Jacket cooling water from the reciprocating engine is recovered at about 180°F and circulated to the lodge to meet heating and domestic hot water loads. The design firm notes that smaller scale projects are often limited with respect to available space. In this case, hot water storage tanks were installed in a raised frame due to space limits.

Energy Efficiency Benefits

More than 10,000 Danish XRGI® units have been sold in more than 27 European countries. The two units at the AmericInn Lodge are the first to be installed in North America. EC Power XRGI® systems are specifically designed for multiple unit installations as needed to meet loads. The prepackaged XRGI modules and controls make them flexible and economical to operate in parallel with staging (switching units on/off as needed) thus efficiently supplying electricity and heat tailored for all levels of demand. The two 19 kW micro-CHP units supply about 100% of the lodge thermal loads when operating and produce about 175,240 kWh of electrical energy annually. EC Power products are now branded and serviced by Lochinvar in North America, who have had the XGRI systems CSA and UL certified.

Highland West Energy notes that "natural gas-fired packaged micro-CHP projects are so much less complex than larger units or biomass-fired CHP units. You just turn them on and run". They have installed packaged micro CHP units in less than four weeks (from contract signing and permitting to installation and commissioning).

Maintenance Requirements

On-site staff performs daily system checks, with Highland West Energy retained to provide maintenance services and hold spare parts in their inventory. Maintenance requirements are minimal with oil changes required about every 8-months or 6,000 hours of operation. Remote monitoring and operation is available at a minimal cost of $50 per year per machine.

"We were so happy with the operation of our CHP system that we decided to install a third (35 kW) CHP unit to meet our pool, spa, and pool deck heating loads".
---Trish Siepert, AmericInn Lodge

For More Information

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