



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

Treasure Valley Family YMCA

Boise, Idaho

70-kW CHP System



Site Description

The Treasure Valley Family YMCA hosts a Cardio Fitness center consisting of a yoga studio, fitness studio, indoor cycling studio, a Pilates studio; a CrossFit studio including a basketball gymnasium, weight-lifting room, racquetball and/or squash courts, a climbing wall, and multi-purpose rooms; a Youth Activity Center; and an Aquatic Center complete with a 50-meter pool, instructional/recreational pool; steam room, sauna, and hot tub. The 101,000 square foot complex serves 23,000 youth, adult, and family members.

Quick Facts

LOCATION: Boise, Idaho
MARKET SECTOR: Youth development and healthy living
FACILITY SIZE: Serves 23,000 members
FACILITY Total Electrical Energy Use: 2,295,680 kWh/year
EQUIPMENT: 2-35 kW reciprocating engines
FUEL: Natural gas-fired
USE OF THERMAL ENERGY: Domestic and potable water, showers
CHP TOTAL EFFICIENCY: About 83% at full-load. Meets 16% of thermal loads and 25% of site electrical loads
TOTAL PROJECT COST: Not available
YEARLY ENERGY SAVINGS: \$1,200 to \$2,400 per year after debt service and maintenance
PAYBACK: Immediate savings given financing
CHP IN OPERATION SINCE: February, 2019

Reasons for CHP

When two of three large natural hot water heaters that provided hot water for showers and domestic uses failed, the YMCA was looking at replacement cost of \$82,000. Management was interested in alternative solutions.

The YMCA had an energy audit that identified multiple cost-effective gas efficiency measures, but they were purchasing natural gas under Intermountain Gas Company's high volume rate schedule at \$0.49/therm. Customers had to use at least 200,000 therms/year to remain on that schedule and any reduction at the YMCA was expected to trigger a rate switch to the utility low volume rate schedule, increasing the gas price to about \$0.70/therm. In this situation, the YMCA could not implement the efficiency measures without fear of triggering natural gas price increases which would greatly reduce cost savings. A CHP installation offered the best of both worlds: CHP would allow the YMCA to capture and increase energy efficiency benefits while remaining a high volume natural gas user and thus retain access to lower-priced natural gas, which substantially improved the economics of implementing CHP.

CHP Equipment & Configuration

Two 35 kW Yanmar natural gas-fired reciprocating engine packaged CHP units were installed. Due to limited available space in the mechanical room, the CHP project was located outdoors with the recovered hot water plumbed into the existing hot water circulation system. The weatherproofed units do not require placement in a building or enclosure. The CHP system produces about 408,000 Btu/hour of recoverable waste heat, representing 16% of facility thermal loads. Four 120 gallon hot water storage or buffer tanks are charged up at night and used to meet peak hot water needs during the day. The operable 1 MMBtu/hour instantaneous water heater was retained for backup purposes.



Two 35 kW Yanmar reciprocating engines in outdoor enclosures.

“Selling” the CHP Project

Highland West Energy, the CHP equipment distributor, was retained to provide a turnkey project, including engineering, project design, equipment supply and construction management for the new CHP system.

Although the CHP project resulted in \$84,000 in avoided natural gas-fired instantaneous water heater replacement costs, and attractive economic forecasts, the YMCA was risk averse about the added costs for CHP and wanted assurances that the CHP project made financial sense and would operate as advertised. Highland West ultimately assumed all risks through providing financing for the YMCA project. A 7-year lease/purchase agreement was structured so lease payments would be repaid through energy savings while providing the YMCA with an immediate positive cash flow of \$1,000 to \$2,000 per month.

Energy Efficiency Benefits

The two 35 kW units are expected to generate about 582,000 kWh/year of electrical energy—equivalent to 25% of the baseline electrical energy purchases, and produce natural gas savings for water and space heating at the site of 37,880 therms/year or 16.3% of the facility’s historical requirements. The project has also allowed the YMCA to implement low-cost energy efficiency measures such as reducing outside air and night temperature setback. At the same time, the overall increase in facility gas use by the CHP project has enabled the facility to obtain natural gas at an even more attractive rate than previously: with a stable and increased natural gas use of about 250,000 therms/year, the YMCA secured a contract with a third-party aggregator to provide gas at a net price of only \$0.38/therm.

“The CHP system is working great. It performs as expected with energy savings as projected”

***---Mike Conaway
Facilities Director
Treasure Valley YMCA***

Maintenance Requirements

Onsite staff performs daily system checks and performs most maintenance themselves. Maintenance requirements are minimal with the YMCA contracting out for periodic rebuild services.

For More Information

U.S. DOE Northwest CHP TECHNICAL ASSISTANCE PARTNERSHIP (CHP TAP)

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More CHP Project Profiles:

www.nwchptap.org/

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