



The Long Island Home

1.25-MW CHP System

Site Description

The Long Island Home is a 325,000 square foot healthcare facility operating South Oaks Hospital, a 197-bed inpatient behavioral health hospital as well as valuable outpatient and ambulatory programs and Broadlawn Manor Nursing and Rehabilitation Center, which encompasses a 320-bed skilled nursing and sub-acute center and a 7-day a week Adult Day Health Center. The Long Island Home has been an integral part of our community providing healthcare since 1882. The Long Island Home is located in the suburban town of Amityville located on the Nassau/Suffolk border and is a member of the North Shore-LIJ Health System.

Reasons for CHP

The Long Island Home (LIH) reinvested in a new CHP system that came online in 2007, replacing their previous CHP system that operated from 1990 to 2006. Reinvestment in CHP allowed LIH to continue realizing energy cost savings and resiliency benefits, to improve efficiency, and to meet new emissions regulations.

- Financial benefits to LIH from the previous CHP system (1990 – 2006) totaled \$9,166,000.
- Projected energy cost savings for 2013 from the current CHP system are estimated to be \$537,500.
- LIH's CHP system is designed to continue powering the campus during macrogrid power disruptions. During Superstorm Sandy, the CHP system powered LIH's campus for 15 consecutive days while the surrounding area was without power.

"Because of our system we can isolate from the grid at any time due to a utility outage or a major storm such as Sandy. This allows us to become a "SHELTER IN PLACE" facility providing all services to our patients and staff and assist the community well beyond the code requirement of 96 hours."

Bob Chester, Director of Engineering

Quick Facts

LOCATION: Amityville, New York
MARKET SECTOR: Healthcare
FACILITY SIZE: 300,000 square feet
FACILITY PEAK LOAD: 1.1 megawatts (MW)
EQUIPMENT: Five 250-kW IntelliGen engines, 400-ton hot water absorption chiller
FUEL: Natural gas
USE OF THERMAL ENERGY: Building heat and cooling, domestic hot water, laundry
CHP IN OPERATION SINCE: 2007
TOTAL PROJECT COST: \$3.1 million
ESTIMATED PAYBACK: <10 years
ENVIRONMENTAL BENEFITS: Significant reduction in NO_x and carbon emissions



Figure caption.

Resiliency Benefits

LIH's CHP system has allowed the campus to maintain full operations through major storms and power outages. LIH's CHP system fully powered the campus through the Northeast blackout of 2003 and through Superstorm Sandy, while much of the surrounding areas suffered a prolonged power outage. When Superstorm Sandy hit the region in October of 2012, LIH isolated from the grid and operated in "island mode." The CHP system supported 100% of the power demands of the campus for 15 consecutive days, providing electricity, heat, and hot water. LIH's freezers and refrigerators kept food and medications stored safely while the kitchens, on-site laundries, and all other operations continued uninterrupted.



LIH's resilient CHP system provided benefits to the surrounding community as well. LIH was able to take in patients from other healthcare facilities in the area that were forced to evacuate. Nearby residents were able to charge cell phones and refrigerate medications. Staff remained at the LIH facility while their homes were without power. Because of LIH's resilient CHP system, it is recognized as a (facility able to shelter in place – Bob mentioned this in his DOE PPT.)

LIH's CHP system is designed to carry 100% of the facility's load. Normally, the CHP system operates in parallel with the utility grid. However, when LIH decides to isolate from the grid the transition to "island mode" is seamless, meaning that patients and staff experience no interruption of power or heat when power supply from the macrogrid is interrupted. The CHP system at LIH is fueled by natural gas from the regional gas distribution system. As a result, LIH can fully rely on power from its on-site CHP system for extended periods of time and is not limited by on-site fuel storage.

System Description

- LIH's current CHP system came online in 2007, replacing a CHP system that operated from 1990 to 2006. Five natural gas fueled engines generate 250 kW each, for a total of 1.25 MW. The facility has room to expand to a sixth engine to increase system resiliency. The system can meet 100% of the LIH's electric and thermal demands.
- Thermal energy is captured from the engine exhaust and from engine jacket water. Each engine produces 541,200 BTU per hour of low pressure steam and 958,800 BTU per hour of hot water.
- Total CHP system efficiency is measured at 88%. The system achieves electrical efficiency of 32% and thermal/mechanical efficiency of 56%.
- Engines meet NYS DEC air emissions requirements by producing less than 0.15 grams per brake horsepower of NO_x. Total annual NO_x emissions have gone from 110,000 pounds per year to 5,700 pounds per year. LIH is able to reduce their carbon footprint by more than 1,900 tons per year.

For More Information

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More CHP Project Profiles:

<http://northeastcleanenergy.org>

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