



Combined Heat and Power (CHP) at Jesse Brown VA Medical Center

Site Description

The Jesse Brown Veterans Affairs (VA) Medical Center, which serves about 62,000 veterans in Chicago, Cook County, IL and northwestern Indiana, includes a 200-bed acute care facility and four community-based outpatient clinics. In 2003, the U.S. Department of Veterans Affairs installed a 3.4 MW combined heat and power (CHP) system at the Chicago medical center to address high energy costs. It is expected to save \$41 million over the system's 25-year life.



Jesse Brown VA Hospital Energy Center



CHP System

- **Installation Year:** 2003
- **Cost:** \$12.5 million
- **Savings:** \$41 million over the 25-year project life (projected)
- **Fuel:** Natural gas
- **Capacity:** 3,149 kW electricity plus 15,000lbs/hr at 130 psi, unfired and 50,000 lbs/hr duct-fired steam
- **System Components:** Solar Centaur 40TM Natural Gas Turbine, Kentube Heat Recovery Steam Generator, 800-ton absorption chiller
- **Operator:** Energy Systems Group under contract with the VA



Project Highlights

- The CHP system supplies nearly all of the medical center's energy needs, providing energy independence and security.
- The CHP system averages >96% annual availability and is supplemented by grid connection and emergency generators to ensure electricity is available when the CHP is down for maintenance.
- Jesse Brown used a financing mechanism called enhanced-use leasing, whereby third parties can own and/or operate energy systems on federal property. The VA paid no up-front costs for the system and pays for use of the energy generated.
- Heat recovered from the combustion turbine is used year-round for steam, chilled water and domestic hot water.



Project Details

To address high energy costs, the U.S. Department of Veterans Affairs (VA) installed a 3.4 MW CHP system at Chicago's Jesse Brown VA Medical Center in 2003. The system replaced electricity the VA had purchased from its local utility Commonwealth Edison and steam it had purchased from the neighboring University of Illinois at Chicago campus. The steam is used year-round for space heating, cooling and domestic hot water.

In addition to expected cost savings of \$41 million over the 25-year project life, the CHP system has improved energy reliability, with consistent annual availability over 96% and less than 4% downtime for maintenance. The VA remains grid connected and maintains emergency back-up generation to ensure electricity is always available.



Financing

To finance the project, the VA used enhanced use leasing, a mechanism that allows federal agencies to put underused properties to beneficial use. Architect and engineering firm Energy Systems Group (ESG) designed and constructed the system which they operate and maintain on VA property. ESG provided the upfront design and construction costs, leases the energy center property from the VA for the CHP system, and charges the VA for energy used. When the final contract ends, ownership of the system will transfer to the VA. The VA realizes significant energy savings and paid no upfront capital costs.



Combined Heat and Power for Hospitals & Health Care

Combined Heat and Power (CHP) systems provide both thermal energy and electric power to hospitals and other healthcare facilities 24/7/365 while improving energy efficiency, lowering operating costs, and reducing emissions associated with power generation and heat production. Importantly, CHP systems can operate independently of the grid during natural disasters, storms and other events, powering life-critical processes, and in some cases the facility's entire load, when electric service from the utility is interrupted. The thermal energy generated in the CHP system can be used for heating and/or cooling, hot water, dehumidification, medical equipment sterilization, food preparation, and cleaning. More than 200 U.S. hospitals and numerous healthcare facilities operate CHP systems to offset power and fuel purchases, save money, and improve energy reliability and resiliency.

Although the project drivers are often the same—cost savings, energy reliability and energy independence—hospital and healthcare CHP systems are tailored for each application.



COLORADO
Energy Office

For more information:

Susan Brodie | Heat is Power Association | susandbrodie@gmail.com | 630-292-1304

Lindsey Stegall | Colorado Energy Office | lindsey.stegall@state.co.us | 303-866-2594

Gavin Dillingham | U.S. DOE Upper West CHP TAP | gdillingham@harcresearch.org | 281-216-7147