



CHP
TECHNICAL ASSISTANCE
PARTNERSHIPS

Erlanger Baroness Hospital

8-MW CHP System



Erlanger Health System is recognized as the 10th largest public health care system in the U.S. according to Modern Healthcare, 2018.

Photo credit: Erlanger Health System

Quick Facts

LOCATION: Chattanooga, TN
MARKET SECTOR: Healthcare
FACILITY SIZE: 686 Beds
GENERATING CAPACITY: 8 megawatts (MW)
EQUIPMENT: (4) packaged reciprocating engines, heat recovery steam generators
FUEL: Natural Gas
USE OF THERMAL ENERGY: Steam used for building heating, sterilization, and laundry
CHP TOTAL EFFICIENCY: up to 84%
ENVIRONMENTAL BENEFITS: Reduces carbon emissions by 20 million lbs annually
TOTAL PROJECT COST: \$13 million (includes \$6.75 million grant from TVA)
YEARLY ENERGY COST SAVINGS: \$1.5 million
PAYBACK: 4 years based on \$6.25M Erlanger investment
CHP IN OPERATION SINCE: April 2018

Site Description

Erlanger Health System, affiliated with the University of Tennessee College of Medicine, includes six Tennessee-based hospitals including Erlanger Baroness Hospital located in downtown Chattanooga. Erlanger Baroness includes the Regional Operations Center, or the nerve center for the entire system, communicating and coordinating pre-hospital and emergency response across a 50,000-square mile region for an average of 37,000 patients per year. Erlanger is also a Level 1 Trauma Center for adults, and the only provider of tertiary care services for the citizens of an entire four-state area, encompassing southeast Tennessee, northern Georgia, northern Alabama and western North Carolina.

In 2018, Erlanger Baroness Hospital implemented an 8-MW combined heat and power system to enhance the hospital's energy resilience while generating clean energy to offset more than 20 million pounds of carbon emissions per year.

Reasons for CHP

As part of an April 2011 agreement with the U.S. EPA, TVA agreed to fund environmental mitigation projects, including those that reduce greenhouse gases and other pollutants through clean/renewable energy projects (including CHP). Under that agreement, TVA issued a request for proposals through which Erlanger was selected for a \$6.75 million grant from TVA to install a CHP system at the Chattanooga hospital. With the CHP system, the hospital saves approximately \$1.5 million on their typical annual energy expenses of \$6 million. Erlanger facility management also realized that by

implementing their own on-site generation, they would benefit from an extra layer of reliability within their power supply. That extra reliability means the hospital can maintain full operations in the event of a grid outage due to natural disasters or cyber security threats.

CHP Equipment & Configuration

The 8 MW project was developed by White Harvest Energy, LLC, who worked with 2G Energy, Inc. to supply 4 packaged MWM TCG 2020 reciprocating engines rated at 2 MW each. Each heat recovery steam generator (HRSG) is connected to two CHP units to optimize steam generation. The fourth engine is operated in standby mode and used when other engines are being maintained or out of service.

The Erlanger CHP system generates:

- 52,000 MWh of electricity annually
- 12,000 lb/hr 115 psi steam
- 14,000 MBtu/hr hot water
- 800 tons chilled water

The CHP system was installed together with a microgrid, giving the hospital the capability to island from the grid in a “flicker free” manner so that staff and patients are not aware or affected by the transfer to island mode operation.



Each pair of gensets at Erlanger Hospital is connected to one heat recovery steam generator (2 HRSGs total) to optimize steam generation. PHOTO COURTESY OF 2G Energy

2G Energy is a Recognized Packager in the U.S. DOE Packaged CHP Systems eCatalog: <https://chp.ecatalog.lbl.gov>

Utility Supported CHP

Tennessee Valley Authority has partnered with the U.S. Department of Energy’s CHP for Resiliency Accelerator program in support of its efforts to enhance grid resiliency and expand distributed energy resource (DER) options as reflected in the federal utility’s Integrated Resource Plan (IRP). The Resiliency Accelerator program was a collaborative effort with states, communities, utilities, and other stakeholders in order to examine the perceptions of CHP among resiliency planners. The program also identified gaps in current technologies and developed plans for communities to capitalize on CHP’s strengths. As a result of this partnership and other initiatives, TVA currently has a draft IRP which includes the consideration of an incentive for implementing DERs to achieve higher, long-term growth of DER options including energy efficiency, demand response, combined heat and power, and distributed solar and storage.

***“This innovative project not only saves energy, but it increases tremendously our reliability in the event of an ice storm, a tornado, cybersecurity threats; anything happening on the grid. We can power critical operations despite those interruptions.*”**

***- John Loetscher, III
Vice President of Facilities,
Engineering and Construction,
Erlanger Health System***

For More Information

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

Isaac Panzarella, PE, Director

919-515-0354

ipanzar@ncsu.edu

More CHP Project Profiles:

www.sechptap.org,

www.energy.gov/chp

White Harvest Energy, LLC

Ben Edgar

b.edgar@whiteharvestenergy.com

www.whiteharvest.com

Erlanger Hospital

John Loetscher, III

Vice President of Facilities,
Engineering and Construction,

Erlanger Health System

John.Loetscher@erlanger.org

Date Produced: 06/2020