



University of Illinois at Chicago West Campus

21 MW District Energy CHP System

Project Overview

The Combined Heat and Power (CHP) system, located at the West Campus of the University of Illinois at Chicago (UIC), has an electric generating capacity of 21 megawatts and can generate up to 360,000 lb/hr of steam to provide building heat, domestic hot water, and absorption cooling to the various buildings of the UIC West Campus. At the heart of the UIC West Campus CHP system lies three 7.0 MW Solar Taurus turbines. The \$36 million CHP plant, installed in 2001, realized annual savings between \$5 and \$7 million and a simple payback below 7 years. Operating in conjunction with the UIC East Campus CHP facility (online since 1993), the CHP systems provide service to the entire university's 8+ million square feet and over 27,000 students.

Background

The existing boiler plant at the UIC West Campus incorporated a central steam system that was originally owned and operated by the local electric utility, Commonwealth Edison. Walk through steam tunnels provided piping of steam to the various campus buildings and no centrally chilled water service or electric generation existed at the time prior to the 2001 CHP installation. With the early success and experience of the East Campus 20.2 MW CHP system, located one mile from the West Campus, CHP seemed to be an ideal solution and upgrade to the existing West Campus operating facilities. The two CHP plants today are connected through a 69 kV tie line down Roosevelt Road that that allows a high degree of flexibility and reliability between the two campuses. The major buildings served on the West Campus by the CHP Facility include:

- UIC Hospital and Outpatient Buildings
- Rush Presbyterian Hospital
- School of Pharmacy
- School of Dentistry
- School of Nursing
- Residence Areas
- Associated Buildings

Quick Facts

LOCATION: Chicago, Illinois

MARKET SECTOR: Colleges & Universities

TOTAL CHP GENERATING CAPACITY: 21 Megawatts

TOTAL HEAT RECOVERY RATE:

90,000 lb/hr steam unfired

360,000 lb/hr steam duct-fired

USE OF THERMAL ENERGY: Heating, Cooling, and Domestic Hot Water

FUEL TYPE: Natural Gas

EQUIPMENT:

(3) 7.0 MW Solar Taurus Natural Gas Turbines

(3) Exhaust Gas HRSGs with Duct Burners

(2) 500 RT Carrier Absorption Chillers

(1) 1,000 RT Carrier Absorption Chiller

(3) 5.4 MW Wärtsilä Natural Gas Engine Generator Sets (peak operation only - no heat recovery)

TOTAL PROJECT COST: \$36 Million

SIMPLE PAYBACK: Less than 7 Years

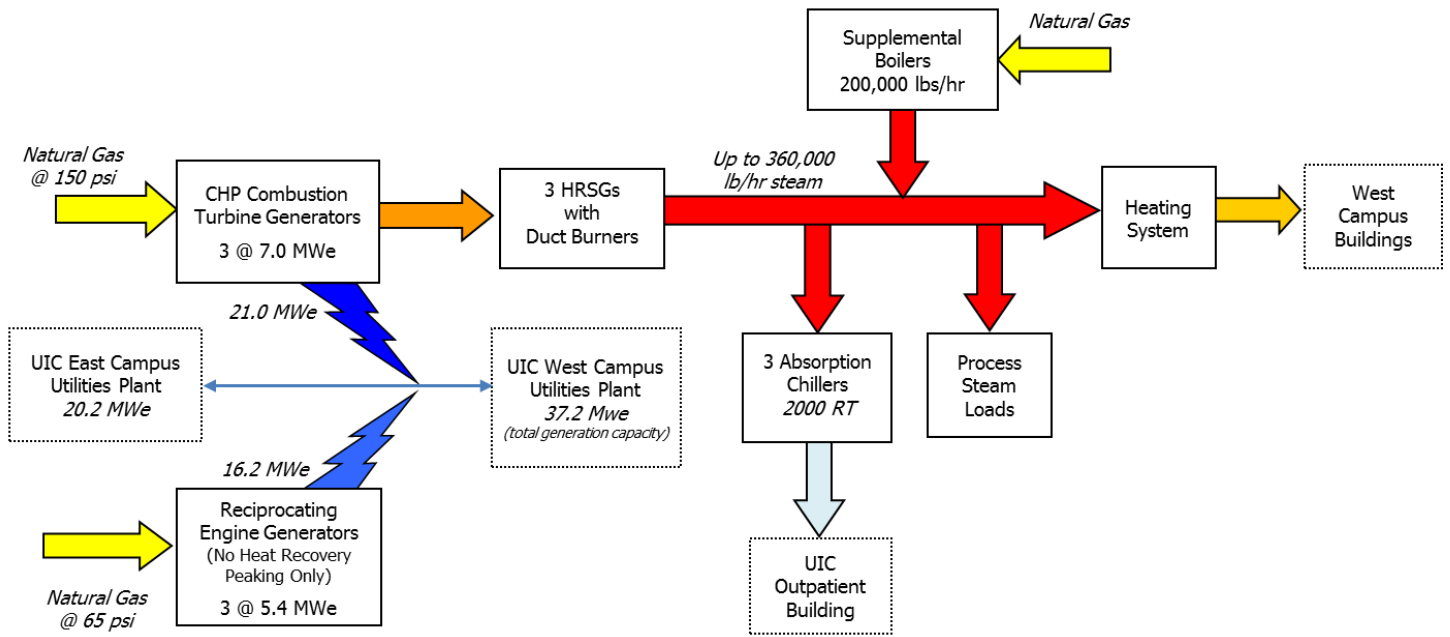
BEGAN OPERATION: 2001

OPERATING SCHEDULE: 24/7



UIC West Campus CHP Facility

UIC West Campus CHP System Diagram



Project Financing and Permit Agreement

This project capital costs were fully financed by the University with no federal, state, or utility subsidies. As part of the agreement for the site permit, the University retired old boiler units on the West Campus and retrofitted catalytic oxidizers on the two Cooper-Bessemer units and installed afterburners on the Wärtsilä engine generators at the East Campus CHP plant.

“The CHP system provides reliable and efficient power and steam to the university. The duct firing capabilities of the combustion turbines enable the CHP system to supply 100% of the required steam to the UIC West Campus.”

Robert Roman,
Director, UIC Utilities



7.0 MW Solar Taurus Turbine Generator

For More Information

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The Midwest CHP TAP is a U.S. DOE sponsored program managed by the Energy Resources Center located at the University of Illinois of Chicago.