



Montclair State University
Montclair, NJ
Energy Master Planning/CCHP Plant Design

ABOUT THE CLIENT

Montclair State University is a public research university that offers a wide range of undergraduate and graduate programs. Located on a 246 acre campus in North Jersey, MSU is the second largest school in New Jersey. The university has consistently ranked among the top 100 public universities in the US.

REFERENCE

Gregory W. Bressler (retired)
 Vice President
 University Facilities
 (609) 273-0853
 Gregory.w.bressler@gmail.com

Shawn Connolly
 Vice President
 University Facilities
 (973) 655-5457
 connollys@mail.montclair.edu

(856) 427-0200
 CONCORD-ENGINEERING.COM



CONSTRUCTION COST:

\$84 Million

YEAR COMPLETED:

2010

MSU SELECTED CONCORD TO DEVELOP AN ENERGY/INFRASTRUCTURE MASTER PLAN ON THE HEELS OF A NEW FACILITY MASTER PLAN

Concord performed an energy evaluation of all buildings' heating, air conditioning and lighting systems on campus. This included detailed energy audits for over 1.4 million sf. The study provided a comprehensive assessment of all deficiencies, upgrade and recommendations. Economic evaluations were analyzed to provide over \$20 million dollars in upgrades and \$2 million dollars in annual savings. In order to properly manage its growth, improve energy efficiency, and increase reliability; the University decided to replace its aging Solar Centaur based combined heat and power (CHP) plant and steam distribution system. **MSU selected Concord Engineering to design a new cogeneration plant and distribution system sized to meet the growing energy needs of the University.** This plant consists of a dual fuel 5.6 MW Solar Taurus 60 combustion gas turbine, with a supplementary fired natural gas heat recovery steam generator (HSRG), plus a dual fuel boiler. The turbine has over 30% more capacity and produces less than 50% of the emissions than the existing unit. In addition, the new unit is 20% more efficient and increases the combined heat and power system efficiency by over 40%.

For the cooling needs of the University, the new central plant also includes a central cooling plant. The initial installation includes a hybrid system comprising a 2000 ton steam turbine driven chiller and a 2000 ton electric centrifugal chiller. The plant was designed for an additional 2500 tons of capacity to be added when the campus cooling demand increases as more buildings are added to the central chilled water loop. Not only is this new central chilled water technology over 25% more efficient than the current local building chillers, the system is also able to help fully utilize the waste heat from the combined heat and power system.

In conjunction with the CCHP Plant project, there was also be the construction of a new chilled water distribution system that connects the major buildings of the central campus core to the new chilled water distribution system. The new steam system design is a 100% replacement of the existing steam system.

The goal of this project was to enter into an agreement with a third party private developer to lease the land and undertake the finance, construction, maintenance, and operation of the CCHP Plant as prescribed by the New Jersey Economic Stimulus Act. This methodology with grant funding assistance will provide MSU with "state of the art" technology combined with higher efficiency and much lower greenhouse gas emissions than the existing campus systems. These improvements would significantly improve the campus energy and cost savings, as well as provide a system which can be economically expanded to meet the planned campus growth. **This project is a model of utilizing public/private partnerships to turn the opportunity for energy efficiency and environmental stewardship into reality.**