Site Description

Colorado College in Colorado Springs, CO has built what is expected to be the first net-zero academic research library in the United States. The major renovation, including a data visualization lab, space for new and emerging technology and a geospatial information system laboratory, was driven by a need to meet the significant technological and digital evolution. Further, the renovation will help the library to better accommodate the college’s new block schedule which has resulted in the bulk of students on campus utilizing the resources of the library at the end of each block.

The recently completed $45 million dollar renovation, with $1.2 million for the energy systems installed, added 25,000 square feet and provide a new look and improved functionality for the 1962 era building. A key component of this upgrade was the addition of a CHP-based microgrid. The microgrid includes CHP and an on-site solar power system. Even with the significant addition of $28,000 square feet and significant increase in plug load, the energy saving measures and the microgrid CHP system will allow the library to save $83,000 per year in utility bills.

Reasons for CHP

A key motivator for the CHP microgrid system was to ensure the resilience of the library, lower operating costs and reduce the college’s overall carbon footprint. When the facility was first designed in 1962, energy consumption was not a significant concern. However, with increasing energy costs there was a growing impetus to improve efficiency of this building and other buildings across the campus.
A geothermal energy field on Armstrong Quad, a 115-kilowatt rooftop solar array and a 130-kilowatt combined heat and power system are all part of the renovation. The library gets additional power from a 400-kilowatt offsite solar array. This system has improved operational effectiveness and reduces the risk of service interruptions.

The CHP system consists of 2 natural gas-fired microturbines (model – Capstone C65) operating in parallel with the grid. Should power to the building be lost, the turbines will maintain critical infrastructure.

Electrical metering modulates the building’s automation system to match demand while connected to the grid.

The National Association of College and University Business Officers (NACUBO) acknowledges individual and institutional excellence and achievement with their annual awards program. In 2017, Colorado College’s Tutt Library received NACUBO’s Innovation Award, recognizing the Carbon-Neutral Net-Zero Energy Library.

Lessons To Share

“This project put into motion years of planning and actions intended to reduce Colorado College’s carbon footprint, and it has redefined our approach to achieving high-performance buildings by emphasizing collaboration and communication at all levels.”

- Mark Ferguson
  Campus Operations & Plant Manager

For More Information

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More CHP Project Profiles: www.uwchptap.org

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