



New energy-efficient facilities optimize RPI's energy usage

Case Study

Sector:
Colleges and Universities

Customer:
Rensselaer Polytechnic
Institute

Location:
Troy, NY

Measures Implemented:

- Lighting
- Heating and cooling
- Energy efficiency



Background

Rensselaer Polytechnic Institute (RPI) in Troy is committed to reducing the environmental impact of its campus. With help from NYSERDA, RPI minimized energy usage and incorporated sustainable design features into three new buildings and an addition, all of which were built between 2003 and 2010.

The projects were:

- **Athletic Village** – A new, gold-level LEED®-certified basketball arena and stadium facility adjacent to Houston Field House.
- **Biotechnologies & Interdisciplinary Studies Building** – The new, four-story 230,770-square-foot building includes laboratories, offices, an auditorium, and mechanical rooms.
- **Bioresearch Core Expansion** – A 13,000-square-foot addition into the first floor of the existing Biotechnologies & Interdisciplinary Studies Building occurred a few years later.
- **Curtis R. Priem Experimental Media and Performing Arts Center** – The new 220,000-square-foot, seven-story, LEED-certified facility is comprised of a 1,200-seat concert hall, 400-seat theater, practice rooms, performance studios, production suites, an atrium lobby and cafe. The dramatic design is built into a hillside and resembles a ship's wooden hull.

Results

The four projects were estimated to result in the following total savings:

- Annual energy savings of 5,199,817 kWh
- Summer peak demand savings of 1,707 kW
- Annual energy cost savings of \$542,601



Recommendations

Computer simulation models and other tools were used to evaluate electric energy efficiency opportunities for the new buildings, ranging from heating and cooling loads, HVAC schedules, and lighting. The energy efficiency investments included:

- Demand-controlled ventilation
- Energy recovery wheels
- Enthalpy economizer on outdoor air flow
- High-efficiency atrium glazing
- High-efficiency windows
- High-efficiency lighting with occupancy and daylighting sensors
- High-efficiency variable air volume (VAV) supply and exhaust systems
- Reduced laboratory ventilation load and heat recovery
- Variable-speed drives on chiller, cooling tower fan, fan motors, and water pumps
- Waste-heat recovery from air handling system exhaust



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