

Ivy League University saves \$315,000 in annual energy costs while improving comfort, sustainability, and being an environmental steward to the community.

Overview



This University (ILU)* is composed of more than 150 buildings. The campus includes classrooms, dormitories, laboratories, libraries, museums, arenas, and administrative offices. More than 7,000 students are currently enrolled.

** Due to confidentiality agreements, we are not able to provide the client name. We will refer to the organization as ILU throughout this case study.*

The Challenge

ILU's environmental sustainability goals include a holistic approach for research, education, and financial considerations while minimizing environmental impacts.

To this end, ILU was interested in implementing energy conservation measures and technologies, which help achieve the sustainability goals while taking into account ILU's specific needs.

Results Achieved

- Financial summary
 - Total energysavings: \$315,000 (annual)
 - Simple payback: 0.23 years
 - Net present value: \$655,546
- Other operational benefits
 - Improved sustainability and environmental stewardship. Achieved 820+ tons in annual CO2 emissions reduction, which is the equivalent of taking 173 cars off the road.
 - Social responsibility in the community from continuously verifiable greenhouse gas reduction reporting.
 - Worked hand in hand with energy audits performed across these buildings to provide optimum energy efficiency strategies.
 - Predictive maintenance: This plan included the inspection and reprogramming of equipment prior to failure, including 7 energy recovery coils in air handling units in the buildings.
 - Improved central plant load capacity by more than 5%. Reduction in building side energy consumption allowed central plant capacity to be utilized elsewhere on campus.
 - Vendor management: Verified optimum sequence of operations programmed into the building automation system (BAS) by outsourced facilities management vendor and maintained 24/7 operations.

Cimetrics' Solution

Cimetrics was selected to provide its Analytika Pro solution for 3 buildings comprising over 400,000 square feet: 2 laboratory buildings and a campus center. Cimetrics collaborated with ILU and Siemens, their building automation system provider, to connect to and collect sensor and actuator data from over 5,200 physical points. Data was collected every 15 minutes, 24 hours a day, 365 days a year, for a total of approximately 500,000 data samples per day. The following systems were monitored: Air Handling Units, Hot Water Pumps, Chilled Water Pumps, Fan Coil Units, Fume Hoods, Terminal Units, Energy Recovery Circuits, and other miscellaneous equipment.

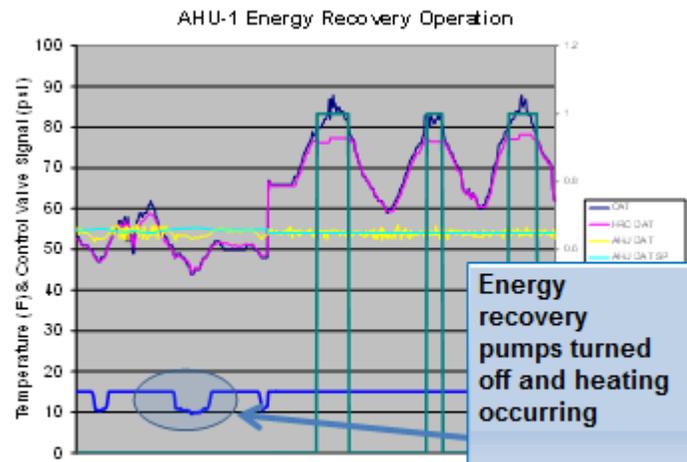
Over 1,000 Analytika software algorithms then analyzed the data to identify opportunities to reduce energy, improve environmental conditions and reduce operations and maintenance costs. Analytika also uncovered potential equipment problems, quantified improved occupant comfort, increased operational uptime, and provided opportunities for profitable retrofit projects.

Experienced Cimetrics engineers leveraged Analytika software to identify opportunities, determine root cause, and calculate annual savings impact. Actionable recommendations were documented and provided to the client both through online and offline channels. Cimetrics' role didn't end at recommendations. Cimetrics engineers engaged with the client team on a regular basis to help answer questions, coordinate implementation, and provide regular feedback on progress.

Example of fault detection and diagnostics: Excess heating in a large 100% outside air AHU

The large air handling unit (AHU) has an energy recovery system. At higher outside air temperatures, the energy recovery pump was on and energy recovery was occurring. At lower outside air temperatures the pump was off and the heating coil valve was opening to heat the air. This issue was not detected by the onsite staff because the downstream temperature was meeting the setpoint; however, it was identified with Analytika.

Due to the size of the air handling unit a repeated fault can equal substantial savings. Two AHUs in the building were operating this way.



Solution

Cimetrics worked with ILU staff and the controls vendor to change the sequence of operation to optimize hours of use for the energy recovery system and reduce heating load in the building.

Annual energy savings achieved: **\$39,000**

Annual carbon emissions reduction: **95 metric tons**

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