

Pharma LEED Platinum headquarters building saves \$405,000 per year, more than 25% of its overall utilities bill

Overview



This world headquarters building (HEQ) * is a 350,000 square foot state-of-the-art office building.

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

The Challenge

HEQ is a showcase building for a 10,000 person global pharmaceutical company. It was designed to be an environmentally friendly building with state-of-the-art technology. This is consistent with the overall corporate sustainability vision to create a cleaner, greener, healthier world. In line with their corporate philosophy, the company wanted to go to the next level of building performance.

Cimetrics' Solution

Cimetrics was selected to provide its Analytika Pro solution for HEQ. Cimetrics collaborated with Schneider, HEQ's building automation system provider, to connect to and collect sensor and actuator data from almost 9,000 physical points. Data was collected continuously, 24 hours a day, and 365 days a year, totaling over 850,000 data samples per day.

The following systems were monitored: 4 air handling units, 17 chilled water and hot water pumps, 2 chillers, 2 cooling towers, over 550 terminal units, solar panel arrays, and a lighting control system.

Over 1,000 Analytika software algorithms continuously analyzed the data to identify opportunities to reduce energy consumption, improve comfort, and reduce operations and maintenance costs.

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 did not end with providing recommendations; Cimetrics engineers engaged with the client team on a regular basis to help answer questions, coordinate implementation, and provide regular feedback on progress.

Results Achieved

- Financial summary
 - Total energy savings: \$405,000/year (26% of annual cost)
 - Simple payback: <6 months
 - Net present value: \$1.5 million
- Operational benefits
 - Sustainability and environmental stewardship: Achieved 1,250 metric tons in annual CO₂ emissions reduction, which is the equivalent of taking 264 cars off the road.
 - Vendor management: Verified that optimum sequence of operations were programmed into the building automation system (BAS)
 - LEED: Provided ongoing commissioning data for LEED points.
 - Utility Incentive: Identified eligible measures under the local utility's incentive program.
 - Code/Safety: Monitored and verified that the AHUs could maintain existing outside air percentage control without compromising air quality throughout the duration of a fire that occurred on a nearby building's roof.

Example of Fault Detection and Diagnostics: Implement zone temperature deadband during occupied times

HEQ has heating and cooling provided by fan coil units (FCUs). The FCUs were maintaining a constant zone temperature setpoint of 72F and were programmed for tight temperature control with no deadband. This was creating valve cycling between heating and cooling coils as seen in Figure 1.

This fault was not detected on-site because the zones were still meeting the setpoint and zone temperature variations were small. However, significant heating and cooling were required to offset each other over time as a result of the BAS programming.

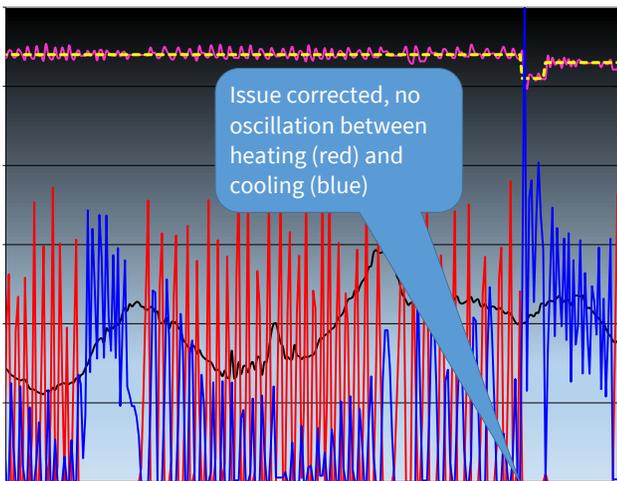


Figure 1: Floor Performance

Solution

Cimetrics worked with HEQ staff to reprogram the BAS to implement a zone temperature deadband. As a result, the FCUs typically remain in either cooling or heating mode for a significant number of hours, no longer oscillating between modes.

Annual energy savings achieved: **\$100,237**

Annual carbon emissions reduction: **311 metric tons**

Example of Optimization: Reduce unoccupied zone heating setpoint for fan coil units (FCUs)

Zones in HEQ were operating at a zone temperature of 72F, 24/7. HEQ is an office building with no occupancy at night and minimal occupancy on weekends.

Implementing a zone heating setback strategy to 65F during unoccupied hours reduced heating requirements over 4,000 hours per year.

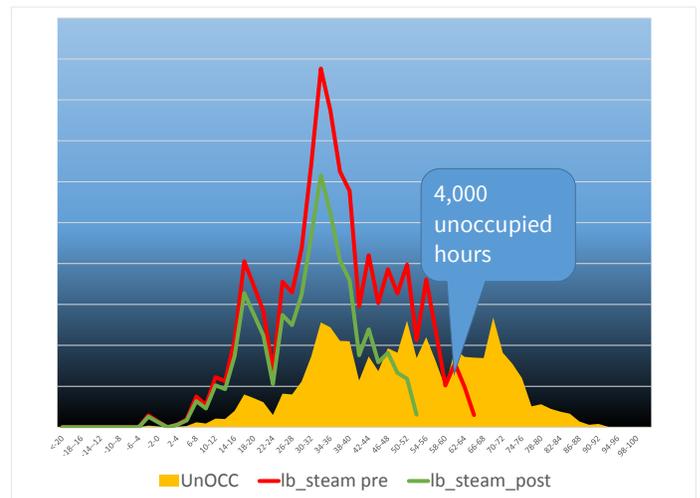


Figure 2: FCU steam consumption pre and post implementation

Solution

Cimetrics worked with HEQ facilities personnel to reprogram the heating setpoint during unoccupied hours to 65F.

Annual energy savings achieved: **\$52,633**

Annual carbon emissions reduction: **163 metric tons**

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+1 (617) 350-7550