



Healthcare Provider in the Southeast

Optimization delivers greater efficiency and energy savings, along with faultless data security

Overview

The central chiller plant for the corporate campus of a large healthcare provider in the Southeast was operating without a hitch. Just 10 years old, the plant was fairly efficient and nowhere near the end of its useful life. But the manager of maintenance and engineering wanted to take its efficiency from good to excellent. He believed that plantwide optimization could reduce energy use, CO₂ emissions, and water consumption for the campus, which has just under a million square feet of air-conditioned space and requires 8,760 hours of cooling annually.

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—Manager, Maintenance & Engineering

The manager worked with Optimum Energy to perform an engineering site assessment (ESA). The ESA showed that by installing Optimum Energy’s OptimumLOOP® software and OptiCx® platform, the resulting plant optimization could deliver significant energy and cost savings. Within six months of deployment, the project saved the company more than \$100,000, cut electricity use by 848,212 kWh, and reduced CO₂ emissions by 1.7 million pounds.

Challenge: No disruption to operations and faultless data security

The facilities team faced only two challenges. One, in order to optimize the central plant holistically as a system, the



team would have to upgrade several components—and it was critical to keep the plant online during installation. Two, the project had to meet the healthcare industry’s rigorous security standards for distributed data. In addition to providing closed-loop control, OptimumLOOP delivers real-time analytics and system diagnostics by monitoring chiller operations and calculating their most efficient operation; information is transmitted through the cloud-based OptiCx platform.

The manager also wanted the project to serve as a model case for the executive team.

“If we could use the chiller plant optimization to demonstrate how we’re saving operational costs, it would make us more credible when asking for capital funding for future sustainability projects,” he said. “I wanted to reduce our energy consumption by 1 million kilowatt hours every year and our electrical demand by 100 Kw per month.”

Solution: Seamless deployment of a secure platform

Upgrading to OptimumLOOP and deploying the OptiCx platform was seamless: The plant had efficient variable-speed York chillers and used Johnson Controls' Metasys Building Automation System, a combination that laid the groundwork for continuous, real-time chiller optimization and the precise data collection that the optimization solution requires.

Before work could start, however, the company's IT department had to be satisfied that the cloud-based OptiCx platform would not put medical records at risk. Optimum Energy's engineers demonstrated that their security protocols have prevented hacks and infiltration throughout the company's history of securing the platform for healthcare customers, and its team customized the security architecture to meet the desired industry standards.

Next, to maximize the plant's efficiency as a single system, Optimum Energy's partner installed flow meters at each of the four chillers and the heat exchanger, five water temperature sensors, 16 variable-position actuators for cooling tower valves, and one variable-position actuator on a chiller. To keep the plant up and running throughout the deployment, the team added these components in phases.

Result: Savings and value exceed expectations

Optimum Energy's OptimumLOOP software and OptiCx platform more than met expectations. The chiller optimization solution, fully deployed in December 2016, is on track to save more than \$200,000 each year. As an added bonus, the company received a \$132,000 rebate from its energy provider for completing an energy efficiency project. The engineering manager also expects to save 3.6 million pounds of CO₂ and reduce energy consumption by more than 1.6 million kWh annually.

The optimization solution has successfully demonstrated the value of sustainability initiatives to the healthcare provider's executive team.

The engineering team can now run the plant more efficiently, addressing problems as they happen. The data that the OptiCx platform provides gives team members an automatic snapshot of how well the equipment is functioning in real time—they can see immediately if anything is interfering with plant operations.

"We can identify potential issues more quickly than before, and if performance deviates from our benchmark, the solution tells us the probable causes," said the engineering manager.

"We now have an overall picture of what efficiency across the plant should look like, as well as the savings that we've achieved," he continued. "We can see it as year to date, compare year to year, and so on. It's definitely helpful for managing the plant."

ABOUT OPTIMUM ENERGY

Since 2005, Optimum Energy has helped customers in healthcare, high tech manufacturing, and other industries reduce energy use in buildings, delivering typical energy savings of 30 percent, improved operating efficiency, and reduced carbon emissions. The OptiCx® platform combines technologically advanced HVAC optimization software with world-class expertise in system design and operations. It has helped current customers save over 1 billion kilowatt-hours of electricity, reduce carbon emissions by nearly 655,000 metric tons, and save over 200 million gallons of water.

DETAILS

Corporate healthcare campus

The chiller plant consists of four variable-speed chillers, two chilled-water booster pumps, four condenser water pumps, eight cooling towers, one free-cooling heat exchanger, and the Johnson Controls Metasys Building Automation System.

Cooling capacity:

3,600 tons

Current maximum load:

1,449 tons

Annual chilled water production:

4.9 million ton-hours

Corporate campus

957,584 million square feet of conditioned space
8,760 hours of cooling per year

Benefits

- Energy savings
- Cost savings
- CO₂ emissions reductions
- Increased visibility into operations

Plant efficiency improvement:

Annual average plantwide efficiency, pre-optimization:
0.79 kW/ton

Annual average plantwide efficiency, post-optimization:

0.53 kW/ton

Utility savings (annual, projected):

Electrical energy savings: 1.8 million kWh/year
Electrical demand reduction: 174 Kw annual average—27 percent reduction
CO₂ emissions reductions: 3.6 million pounds/year

Financial savings (annual, projected):

Annual operations costs: \$223,034