



Global Optical Care Manufacturer

Optical Products Manufacturer Looks to AHU Optimization to Extend Carbon Savings

Overview

A global manufacturer of optical care products is also an innovator in energy and carbon reduction strategies. Since the European facility undertook its first chiller plant optimization project, the manufacturer not only has optimized its chilled water systems, but also has expanded its carbon-saving efforts to the air handling units (AHUs).

The site's energy lead had suspected that many of the facility's 60 AHUs were consuming too much energy—and discovered that significant energy savings were possible through AHU optimization, even for a building with strict air temperature and pressure parameters.

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—Facility Energy Manager

The project kicked off when the company asked Optimum Energy to scope a plan to modernize and optimize more than half of the facility's AHUs as part of a corporate energy-saving initiative. The project included retro-commissioning the largest AHUs, adding state-of-the-art upgrades, and installing Optimum Energy's OptimumAIR® software platform. After six months of full deployment, the project is on track for annual savings of 3.3 million kWh of electricity and \$412,000.

“This project will deliver 1,380 metric tons of CO₂ savings,” the facility energy manager said. “We’ve been able to seamlessly achieve the correct temperatures using a lot less energy.”



Challenge: Extending HVAC optimization

The company had already cut its carbon footprint through other corporate initiatives, including the optimization of chiller plants with Optimum Energy's OptimumLOOP® solution. The HVAC air handlers were the logical next step.

Optimum Energy first determined the energy savings potential and defined the project scope. The team began with a high-level go/no-go feasibility analysis, followed by a detailed basis-of-design scoping study, which revealed that the ideal solution was to optimize 35 AHUs—however, the team needed to address each one individually. For example, some units had broken sensors, some required new variable frequency drives, and most required tuning to building automation system (BAS) sequences. The first priority was to get each AHU up to modern efficiency standards and prep all of them for the air-side optimization software.

“There was initially a degree of skepticism because we thought we’d already done everything we could do to optimize the AHUs. But we were wrong,” said the energy manager, who was reassured by Optimum Energy's track record of more than 250 optimization projects around the world.

“It was a well-scoped, well-engineered plan, and Optimum Energy’s engineers were very good at finding opportunities to save additional energy and working with the building automation system vendor to make them happen.”

Solution: Dynamic control over temperature and fan speed

With the mechanical upgrades completed, the team was ready to install the OptimumAIR solution and integrate it with the BAS. The software would provide intelligent, coordinated control of the two main factors that determine how much energy an AHU consumes: fan speed and air temperature. OptimumAIR and the cloud-based OptiCx® measurement and verification platform provide continuous optimization of the air handlers to meet temperature, air flow, and humidity requirements. Now the AHUs react dynamically as conditions change, saving energy at both the AHUs and the central chiller plant.

Results: Exceeding CO₂ savings expectations

After six months of full operation, the project has reduced fan energy consumption by 44 percent, exceeding Optimum Energy’s original savings projection by 30 percent overall.

The energy manager expects the savings to increase over time. “We’ve been able to step back the speed of the fans, and it’s phenomenal how much we’ve reduced the amount of power they use—from 20 to 50 percent, depending on the unit,” he said. The company is planning to bring a few more AHUs online over time.

He also pointed out unexpected improvements in facilities and operations management as a result of this optimization project. Because all of the fans are moving less air than before, he believes the AHUs’ fans, motors, and belts will last longer.

“Before anyone on the floor notices a change in temperature, the OptimumAIR solution sends us alerts if temperatures slip or if there’s any sort of equipment failure, like a faulty fan,” he said. “Optimum Energy is actively looking for ways for us to save more energy. They’re vying for us, which makes them a good partner.”

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

The European site is an 850,000-square-foot manufacturing and packaging facility for optical care products with three chiller plants and 60 AHUs. Most of the space requires around-the-clock cooling with specific air temperature and humidity parameters. The chiller plants are equipped with the OptimumLOOP® chilled water plant optimization software and the OptiCx® platform as well as a Schneider BAS.

Plant specifications

- Cooling plant capacity: 4,085 tons
- Chilled water production: 6,085,200 ton-hours
- 850,000 square feet of conditioned space
- 8,760 hours per year of chiller plant operation

Project benefits

- Energy savings
- Cost savings
- CO₂ emissions reduction
- Enhanced system visibility and troubleshooting capabilities

Utility savings (annual, projected)

- Electrical energy savings: 3.3 million kWh/year
- CO₂ emissions reductions: 1.4 million kg/year

Financial impact (annual, projected)

- Estimated cost savings: \$412,000
- Estimated simple payback: 3.7 years
- Estimated IRR and NPV: 29% IRR and \$2.6 million NPV