

CASE STUDY / CENTRAL PLANT OPTIMIZATION

Baylor University

Optimizing a typical, well-running chiller plant saves money, boosts efficiencies, and transforms manual operations into real-time automation.

LOCATION

Waco,
Texas

FACILITY

Baylor University
Chiller Plant

ENGAGEMENT

Continuous
Optimization

SOLUTIONS

OptimumLOOP® +
OptiCx®

YEAR 1 SAVINGS

\$460K

per year

Year-one utility savings,
roughly 24% of campus
electricity costs

ENERGY SAVINGS

2.9M

kWh per year

Average annual electrical
energy savings over the
partnership

CO2 REDUCTION

4.3M

lbs per year

Average annual carbon
emissions reduction

Overview

Baylor University, a private college in Waco, Texas, had a typical chiller plant; it ran well, but it was also a hodgepodge of equipment managed manually. Kenneth Haltom, who manages Baylor's energy services through a partnership with Aramark Energy Services, suspected that chiller plant optimization would be the best way to increase efficiency and reduce costs.

The energy team brought in Optimum Energy to assess the opportunity and found that their hypothesis was right. Within the first year of installing OptimumLOOP® and the OptiCx® platform, Baylor saved more than \$460,000. Demand for chilled water decreased across the campus and its air-conditioned spaces became more comfortable.

The Challenge: Automate a Plant With Widely Varying Equipment Across Eight Chillers

Prior to optimization, plant operators acted on critical decisions only once per shift. Human error made the plant even more inefficient, with operators interpreting criteria differently and resulting in inconsistent system adjustments.

The plant equipment varied widely. Some of the eight chillers were 18 years old, while others were only a year old. Three had variable-speed drives, two had dual compressors, and each had a different pressure drop and design flow.

The Solution: OptimumLOOP® Finds Ideal Balance Points Across All Eight Chillers in Real Time

Optimum Energy's OptimumLOOP® is a closed-loop solution that reads data every 30 seconds and dynamically adjusts chiller plant equipment in response to changing conditions. Since variable-speed drives were already installed on all pumps and cooling towers, no mechanical changes were required.

The software automatically determines the best operating conditions across the plant and makes on-the-fly changes to all eight chillers, nine primary chilled water pumps, 11 condenser water pumps, and 13 cooling towers.

- 8 chillers dynamically staged and balanced in real time
- Siemens BAS integration, no network changes required
- OptiCx® provides performance visibility and equipment-level analytics

Results

Year-one savings reached \$460,000, representing 24% of electricity costs. Over the partnership, Baylor has averaged 2.9M kWh and 4.3M lbs CO2 saved annually.

DETAILS

Baylor University

A private university in Waco, Texas, with 4.9 million sq ft of conditioned space cooled 365 days per year and 16,196 tons of central cooling capacity across 8 chillers.

PLANT EQUIPMENT

- 8 chillers (mix of ages, VSD and constant-speed)
- 9 primary chilled water pumps
- 11 condenser water pumps
- 13 cooling towers
- Siemens building automation system
- OptimumLOOP® real-time optimization
- OptiCx® remote monitoring and advisory

PERFORMANCE RESULTS (ANNUAL AVG)

Pre-Optimization Efficiency	0.897 kW/ton
Post-Optimization Efficiency	0.681 kW/ton
Electrical Energy Savings	2.9M kWh/yr
CO2 Reduction	4.3M lbs/yr

FINANCIAL RESULTS

Year 1 Utility Savings	\$460,000
Annual Operations Savings	\$209,000

"Chiller optimization offered us the biggest bang for the buck when Baylor explored ways to reduce its energy spend. Optimum Energy is top notch, their engineers really understand the chiller equipment, and OptimumLOOP® works very well, is flexible, and integrates seamlessly with our Siemens building automation system."

— Kenneth Haltom, Aramark Energy Services

Year 1 savings and ongoing averages reflect verified measurement-and-verification results over the multi-year partnership. Annual averages reflect sustained performance over multiple years of continuous optimization.