OPTIMUM ENERGY

HIGHER EDUCATION

CASE STUDY / CENTRAL PLANT OPTIMIZATION

University of Texas at Austin

An enduring 15+ year partnership delivers innovation, efficiency, and energy savings even as the campus grows significantly.

LOCATION	FACILITY	ENGAGEMENT	SOLUTIONS
Austin, Texas	UT Austin Campus (CS3–CS7)	Continuous Optimization, 15+ Yrs	OptimumLOOP® + OptiCx®

CO2 PREVENTED

72,000

metric tons/year

Annual CO2 emissions prevented through campus-wide optimization

ENERGY SAVINGS

29.2M

kWh per year

Annual electrical energy savings compared to 2008 baseline

CAMPUS ADDED

3.7M

sq ft (2009–2019)

Square footage added to campus while chilled water energy use stayed flat

Overview

To meet campus growth needs, the University of Texas at Austin found it far more economical to be more efficient than to invest in new power production capacity. Working in partnership with Optimum Energy since 2007, UT has achieved what seemed impossible: reducing the chilled water system's overall energy usage even as the campus grew significantly.

From a starting efficiency of 0.79 kW/ton, the campus has improved to 0.59 kW/ton, while absorbing 3.7 million square feet of new buildings and preventing 72,000 metric tons of CO2 annually. The UT Austin partnership spans five chilling stations, two thermal energy storage tanks, and 15+ years of continuous optimization.

The Challenge: Gain Further Efficiency From a Growing Campus District Cooling System

One challenge was the physical hydraulic constraints affecting flow in the campus' chilled-water distribution loop. The system was over-pressurized: pumping too much water created false building loads and excess steam to compensate.

The long-term challenge was even more ambitious: could the campus grow substantially while keeping chilled water energy use flat? UT and Optimum Energy believed the answer was yes, setting out to prove it through a predictive thermal energy dispatch strategy.

The Solution: Coordinated Multi-Plant Optimization and Predictive Thermal Energy Dispatch

Using a real-time hydraulic flow model, the teams added new instrumentation and a coordinated multiple-plant pumping algorithm. Running at 8 psi differential at peak and 2 psi in winter cut 1,500 hp of pumping energy.

OptiCx® enabled raising the chilled water temperature up to 44°F based on real-time conditions. The team also built an automated control strategy using weather forecasts to manage thermal storage and flatten the campus load curve.

- 5 chilling stations (CS3–CS7) operating as an integrated, coordinated system
- Two TES tanks (~22,000 tons) dynamically dispatched via weather-forecast controls
- Pumping system rebalanced: 8 psi peak / 2 psi winter, cutting 1,500 hp

Results

UT Austin achieved 29.2 million kWh saved annually, a 4.2 MW peak load reduction, and 72,000 metric tons of CO2 prevented, while absorbing 3.5 million square feet of new buildings with flat overall energy use.

DETAILS

University of Texas at Austin

One of the largest public universities in the US, with 19.6 million sq ft of conditioned space served by five chilling stations and an on-campus combined heat and power system.

PLANT DETAILS

- 5 chilling stations (CS3–CS7), 63,000 tons total capacity
- Two TES tanks: 4.33M gal + 5.33M gal (~22,000 tons)
- 146M ton-hours chilled water production annually
- Allen-Bradley PLC with OptimumLOOP® integration
- OptiCx® monitoring, analytics, and 48-hr forecast dispatch
- Combined heat and power (CHP) system integration

PERFORMANCE RESULTS (ANNUAL)

Pre-Optimization Efficiency	0.79 kW/ton
Post-Optimization Efficiency	0.59 kW/ton
Electrical Energy Savings	29.2M kWh/yr
Peak Load Reduction	4.2 MW
CO2 Reduction	72,000 tons/yr

SCALE

Chilled Water Production	146M ton-hours
Cooling Hours	8,760 hrs/year
Partnership Duration	15+ years

> *"The secret to our success is having the right balance of plant equipment, marrying that with the optimization and dispatching opportunities Optimum provides, and doing it in a way they don't compromise or fight each other. When they do good, we do good."*
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> — Juan Ontiveros, Associate Vice President for Utilities & Energy Management, UT Austin

Results compared to 2008 baseline year. Energy savings, peak load reduction, and CO2 figures reflect verified annual averages over the 15+ year Optimum Energy partnership through 2024.

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