UNIVERSITY RESEARCH FACILITY, US NORTHEAST

# Condenser water that follows the weather

**14.0%** less cooling-mode plant energy, measured over summer 2026 and applied to a full year of plant data

The research building's 800 ton chilled water plant held its condenser water near 66 °F whatever the weather. To hold it, the two tower fans ran at a median 88% speed, and both towers ran together most of the time.

Exergenics modeled the plant from a year of its own BMS trend data and replaced the fixed setpoint with a condenser water reset that follows wet bulb and load. The university's controls team programmed it into the existing BMS in June 2026. No hardware was added.

**80,832 kWh**
saved a year

**0.809 to 0.696**
plant kW/ton

**29.3 t**
$CO_2e$ avoided a year

Facility
University research and laboratory building

Plant
2 × 400 TR chillers, two cooling towers

Strategy
Dynamic condenser water temperature reset

Controls
Existing BMS, programmed by the site team

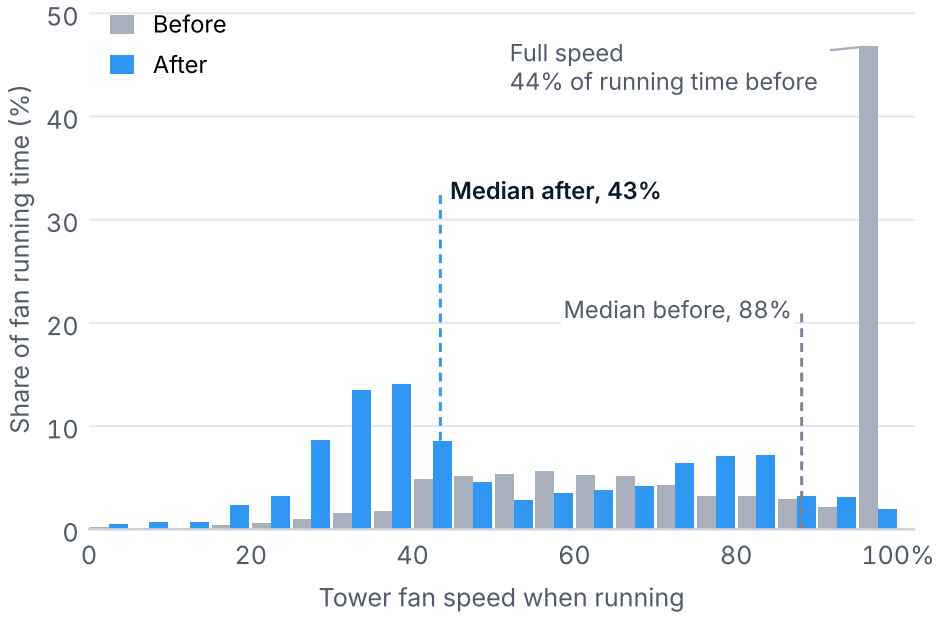
Baseline
March 2025 to March 2026

Commissioned
June 2026

Measured
3 June to 15 August 2026

Data
5 minute BMS trends

## Half the fan speed, and rarely at 100%



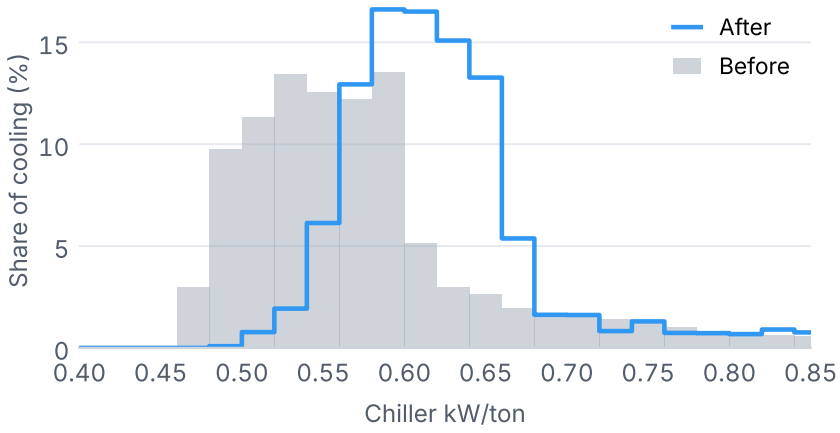

How the two tower fans spent their running time, before and after the change, compared at the same wet bulb and the same cooling load.

Median fan speed fell from 88% to 43%. Full speed went from **44% of running time to almost none**, and both towers ran together 29% of the time instead of 64%.

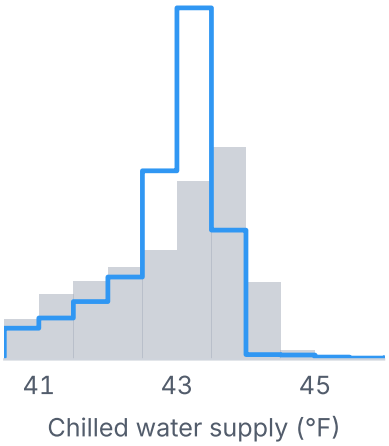
Fan power falls roughly with the cube of speed, so tower fan energy fell 79%.

## The chillers worked slightly harder

Warmer condenser water raises the lift on the chillers, from 25.5 °F to 30.6 °F on average, so each ton of cooling took 6.4% more chiller energy. That is the trade the reset makes on purpose, and the fan saving is about four times larger. Chilled water to the building did not change.




Chiller kW/ton, weighted by cooling delivered. Average 0.610 before, 0.649 after.




Chilled water supply. Median 43.1 °F before and after.

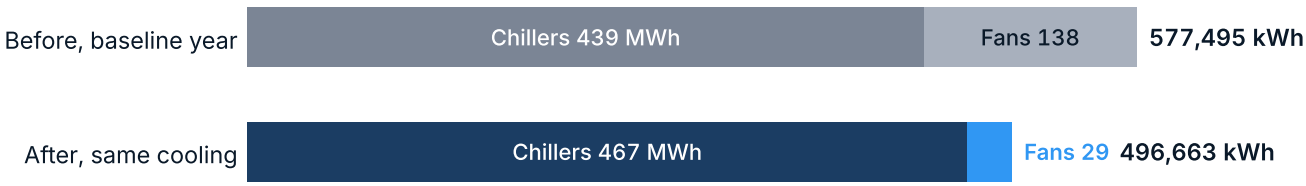
## Where the saving landed

The tower fans give up far more than the chillers take on.

**108,840 kWh**
less tower fan energy a year

**28,008 kWh**
more chiller energy a year

**15.35%**
measured from 3 June to 15 August 2026, 34,358 kWh below the adjusted baseline. Every day compared used less energy.




Annual cooling-mode plant electricity, baseline year against the same cooling delivered with the strategy in place.

**How it was measured**

IPMVP Option B, with the boundary around both chillers and both tower fans. Summer 2026 was measured against an adjusted baseline from a regression of daily plant energy on cooling delivered and weather ($R^2$ 0.96). The annual figure sorts every 5 minute interval by wet bulb and cooling load, compares plant kW/ton before and after inside each matched band, and applies the improvement to the baseline year. Pump energy ran the same way in both periods and is outside the boundary.