

THINK OUTSIDE THE PLANT

Transform Campus Cooling with Real-Time Data & Smart Control Valves

IDEA Campus Energy | February 2016

FlowEnergy



40% of building energy is
used by comfort systems.

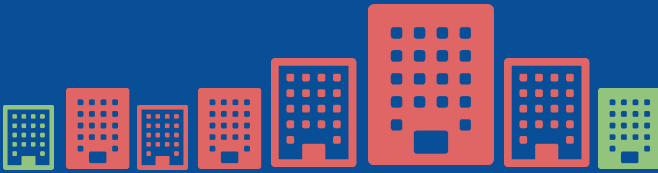
\$1 out of every \$3
spent is wasted.

ARIZONA WESTERN COLLEGE - HOW WE STARTED

- ✘ Trouble cooling far end of campus
- ✘ Lots of comfort complaints and manual adjustments
- ✘ Using all three chillers in the summer months
- ✘ High electricity consumption and inflated peak demand
- ✘ No spare chilled water capacity to support campus expansion
- ✘ Building a new central plant would be multimillion dollar project

REDUCE THE COMFORT SYSTEM DEMAND

WITH SMART HARDWARE & ENERGY MANAGEMENT SOFTWARE

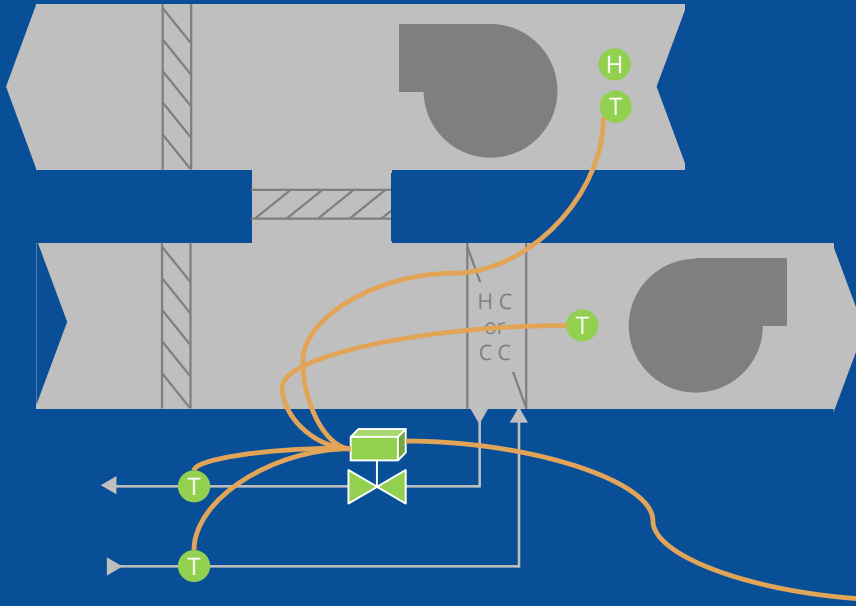


Campus Buildings



Central Plant

HOW IT'S ALL CONNECTED



Cloud Monitoring

View real-time and historical energy consumption data.



Weather Data

Outside conditions temperature, dewpoint, and enthalpy.



Electricity Meters

Collect power consumption at each building.



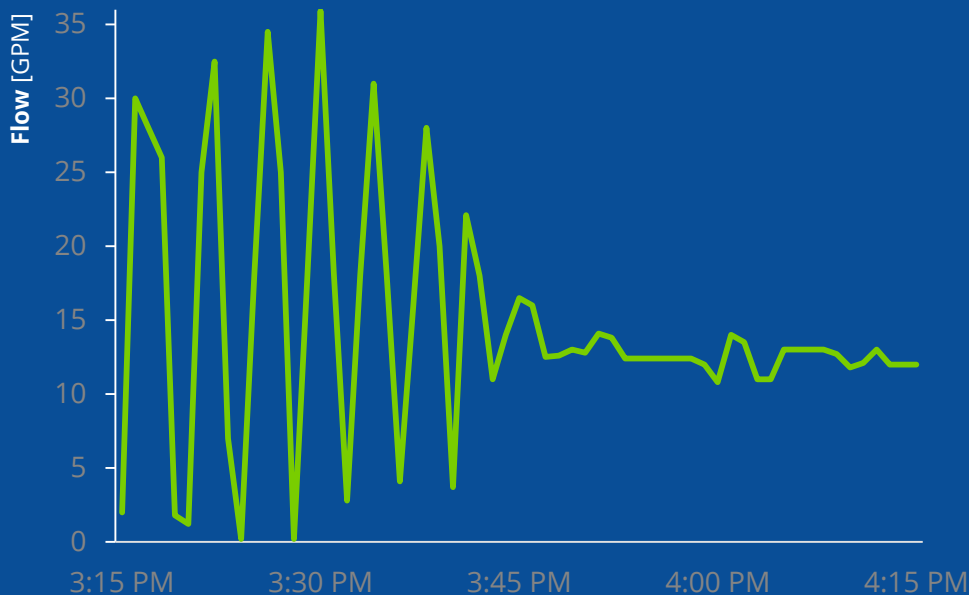
SmartValves

Capture flow, ΔT , BTUs, pressures, temperature, humidity.



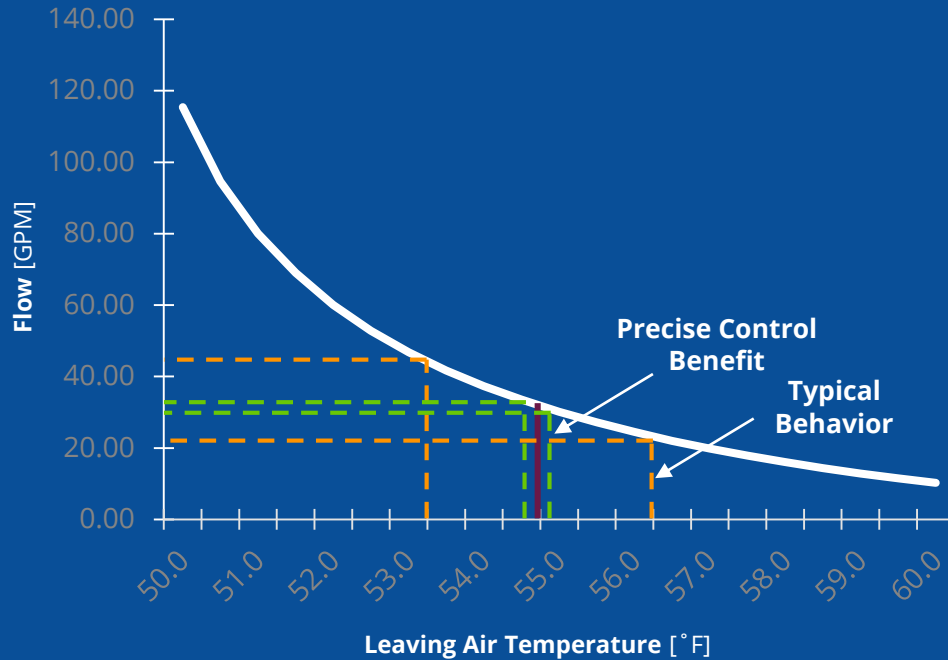
SMART CONTROL VALVE PROVIDES STABILITY

WHICH LEADS TO ENERGY SAVINGS & IMPROVED COMFORT



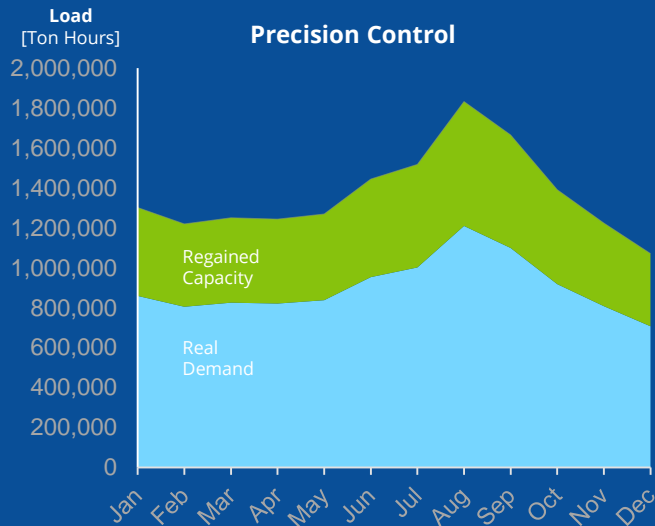
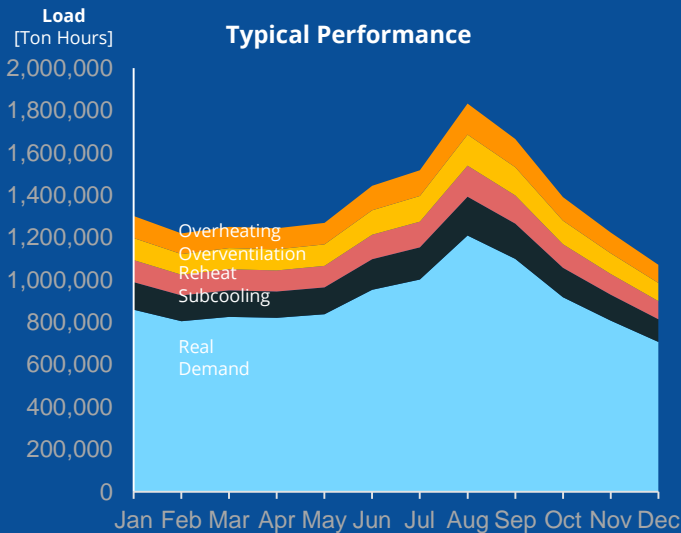
WHY STABILITY IS CRITICAL

COIL DEMAND DRIVES SYSTEM ENERGY



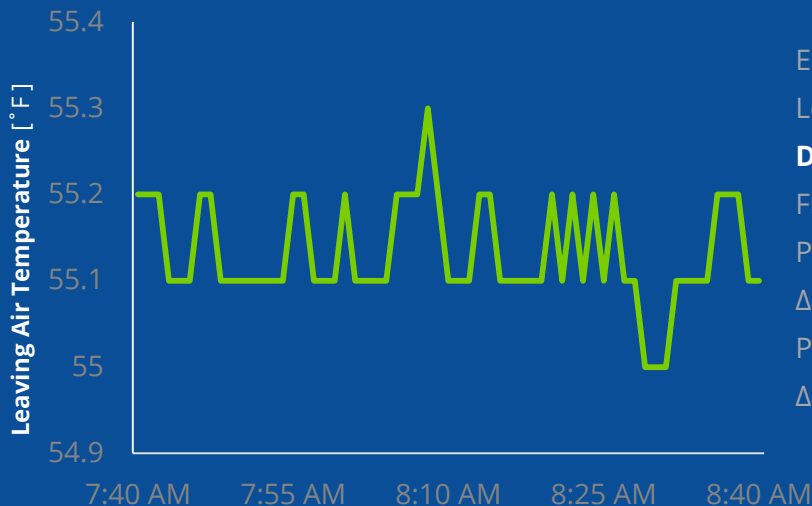
MAXIMIZE COOLING CAPACITY

BY ELIMINATING SUBCOOLING, REHEAT, OVERHEATING, & OVERVENTILATION



PRECISE TEMPERATURE CONTROL

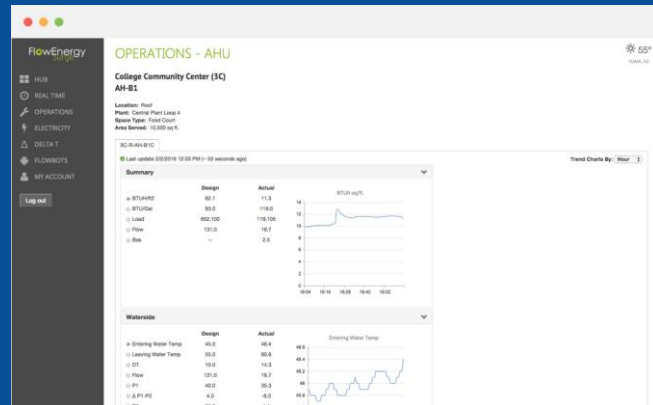
MAINTAIN $\pm 0.1^{\circ}$ COIL LEAVING AIR TEMPERATURE



	Design	Actual
Entering Water Temp.	40.0	44.1
Leaving Water Temp.	55.0	63.3
Delta T	15.0	19.2
Flow	128.0	29.7
P1	20.0	50.6
Δ P1-P2	5.0	3.2
P3	10.0	23.5
Δ P1-P3	10.0	27.1

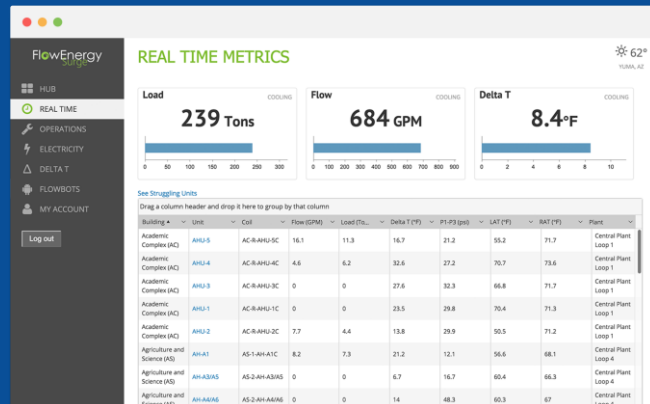
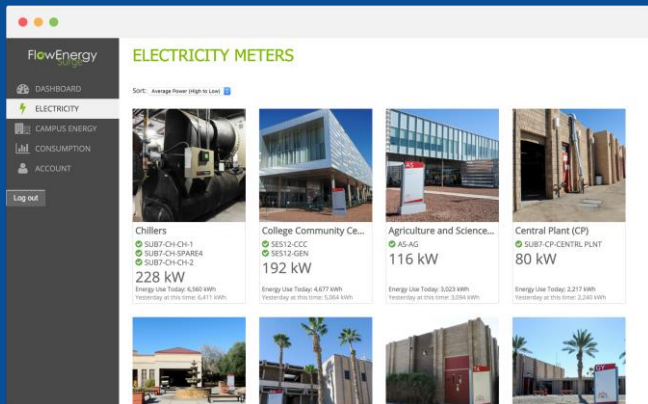
REAL-TIME DATA ENHANCES OPTIMIZATION

MONITOR KEY METRICS – FLOW, LOAD, DELTA T, PRESSURE

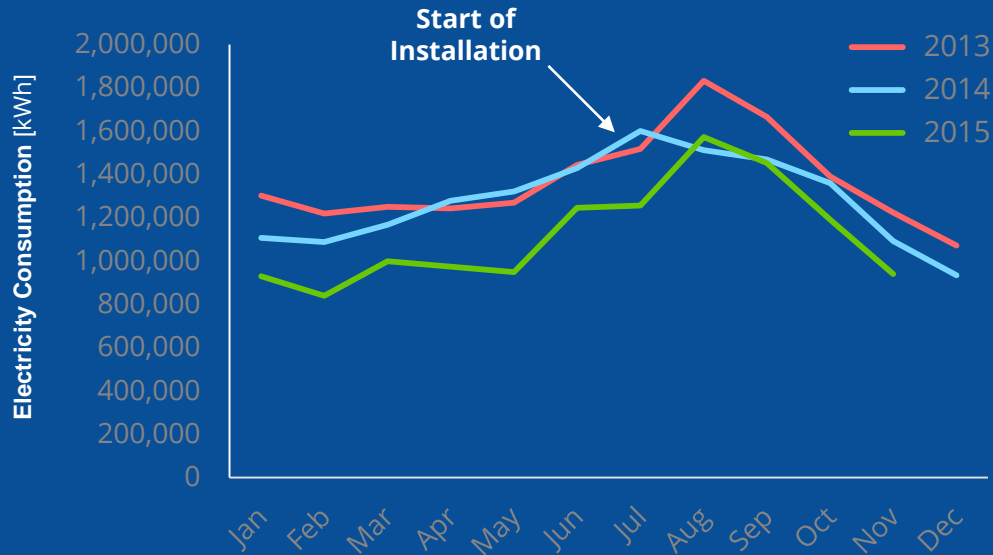


REAL-TIME DATA ENHANCES OPTIMIZATION

USE FOR EQUIPMENT DIAGNOSTICS & FAULT DETECTION



CAMPUS ELECTRICITY USE BY MONTH



RESULTS @ ARIZONA WESTERN COLLEGE

- ✓ 2,500,000 kWh annual electricity savings (\$225,000/15%)
- ✓ 430 kW reduction in peak demand charge (15%)
- ✓ \$275,000 utility rebate (largest in county history)
- ✓ Significant reduction in comfort complaints
- ✓ Recovered 22% of system cooling capacity
- ✓ Added three new buildings to chilled water system

THANK YOU.

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