KEEPING UP WITH DEMAND

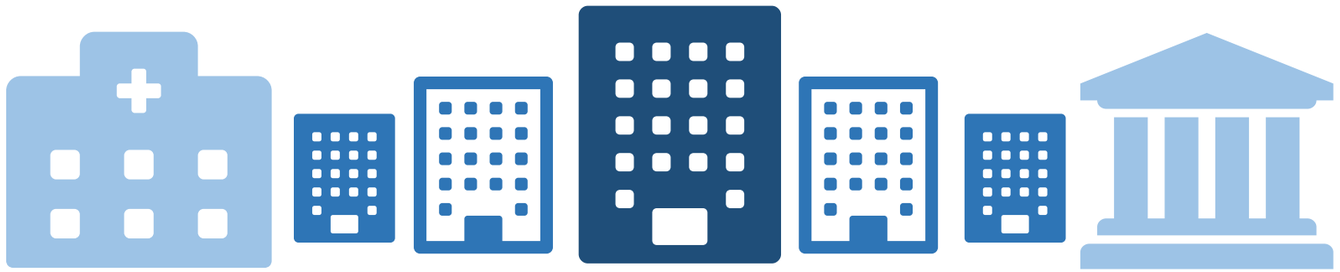
PILOT PROJECT RESULTS FOR CHILLED WATER OPTIMIZATION IN NYC HEALTHCARE & CITY BUILDINGS

IDEA Annual Conference | June 2018

IDEA2018
Local Solutions, Global Impact
109TH ANNUAL CONFERENCE & TRADE SHOW
June 11-14 | Vancouver Convention Centre | Vancouver, BC

FlowEnergy Surge

Define “Local”

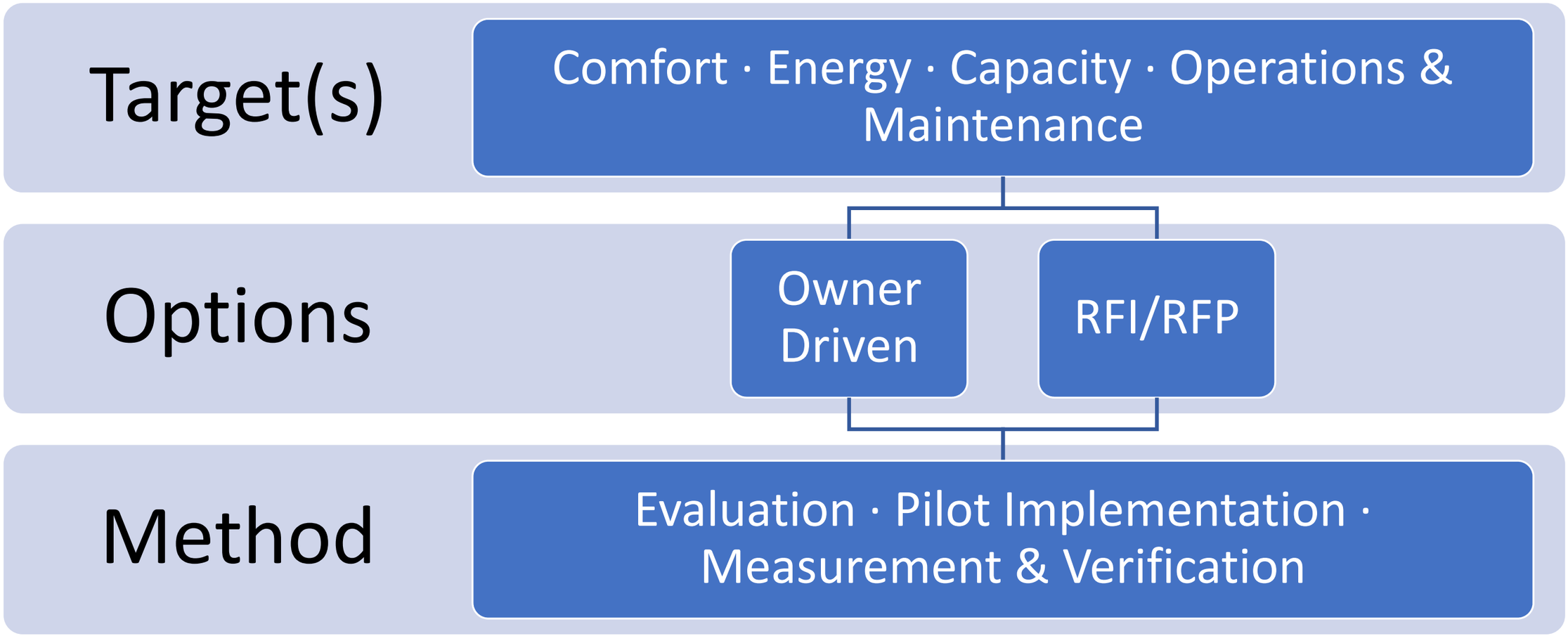


Building

Campus

Region

What is the Process?



Owner Driven: NYC Research Hospital

- Large main campus in NYC with multiple regional locations
- Complimentary optimization strategies in various stages:
  - Conversion from Primary-Secondary to Variable-Primary pumping
  - Investigating CHW plant optimization packages
  - Installing data monitoring hardware/software
  - Operator continuing education & certification

Start Simple

Pilot project goal: **Improve AHU discharge air temperature stability**

- Initial solution: Install pressure independent CHW control
- 2010 Pilot project: 2x 100% OA AHUs, 20,000 CFM, 267 GPM each
  - Results: **Stabilized discharge air temperature control**

- 2011 Follow up: 3x 100% OA AHUs, 130,000 CFM, 1,607 GPM each
  - Results: **Stabilized discharge air control w/in 0.2°F of setpoint**
  - Bonus: **Improved overall system ΔT to ≥ 12°F coil design**

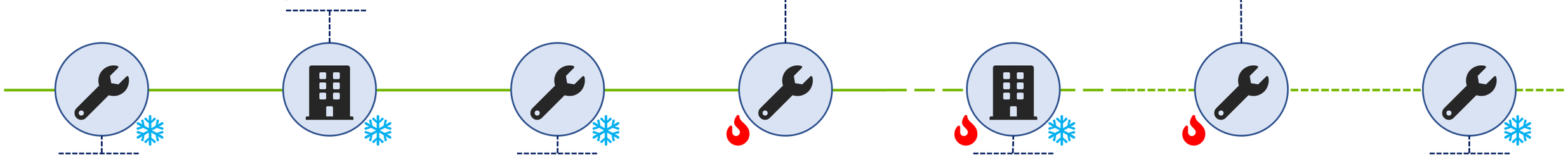
Build on Success

Partial Retrofit
- ✓ AHUs
- ✓ Improved DAT control
- ✓ Improved ΔT

New Building
- ✓ AHUs
- ✓ Simplified installation
- ✓ Precise control
- ✓ High ΔT

Campus Retrofit
- ✓ AHUs
- ✓ Improved ΔT
- ✓ Reduced elec. demand

Partial Retrofit
- ✓ Terminal units
- ✓ Reduced flow
- ✓ Improved ΔT



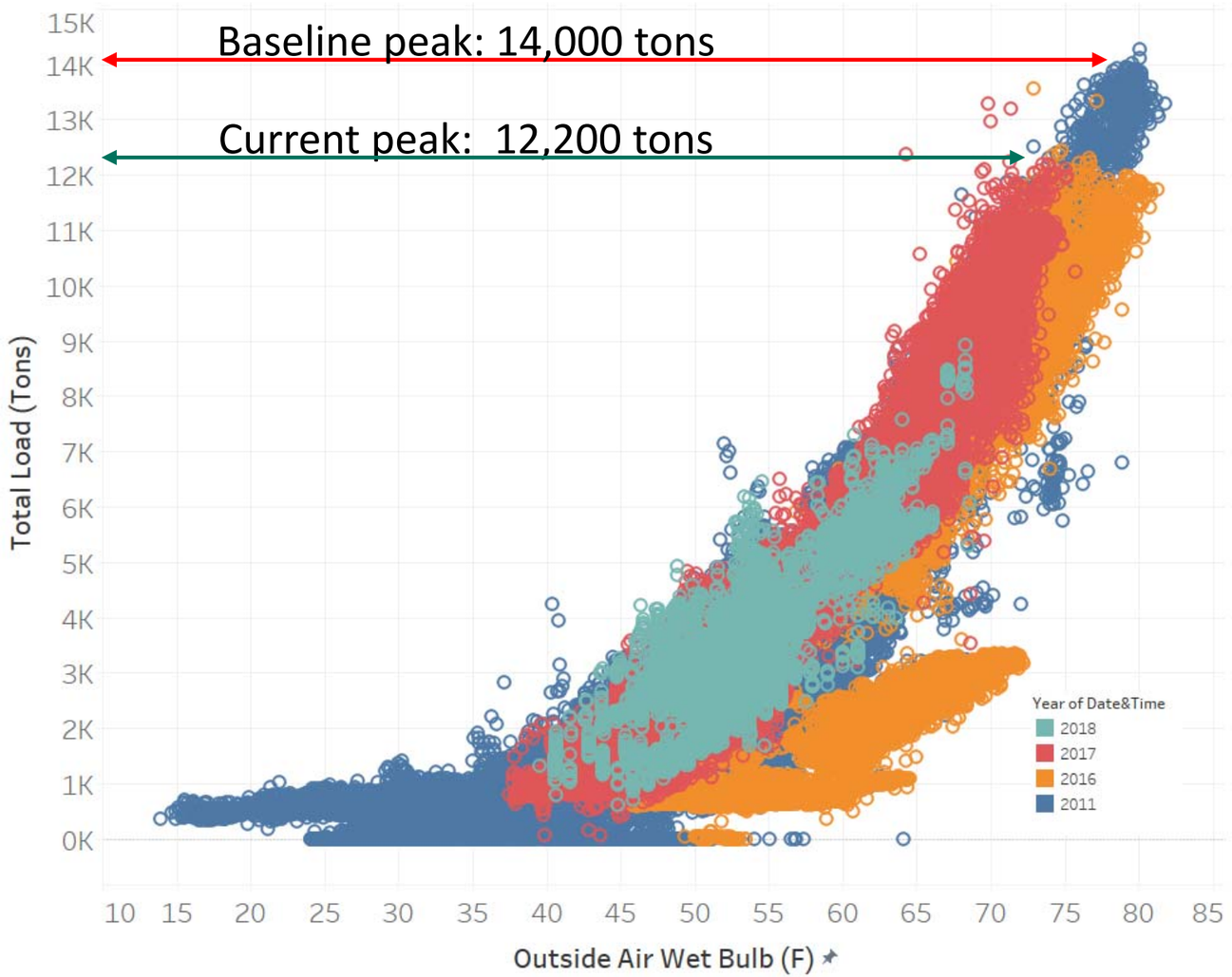
New Building
- ❑ All Equipment
- ❑ Simplify installation
- ❑ Precise control
- ❑ High ΔT

Campus Retrofit
- ❑ AHUs
- ❑ Target ΔT
- ❑ Simplify installation

Small Retrofit
Next Gen. Tech
- ❑ AHUs
- ❑ Improve ΔT
- ❑ Continuous commissioning
- ❑ Data analytics

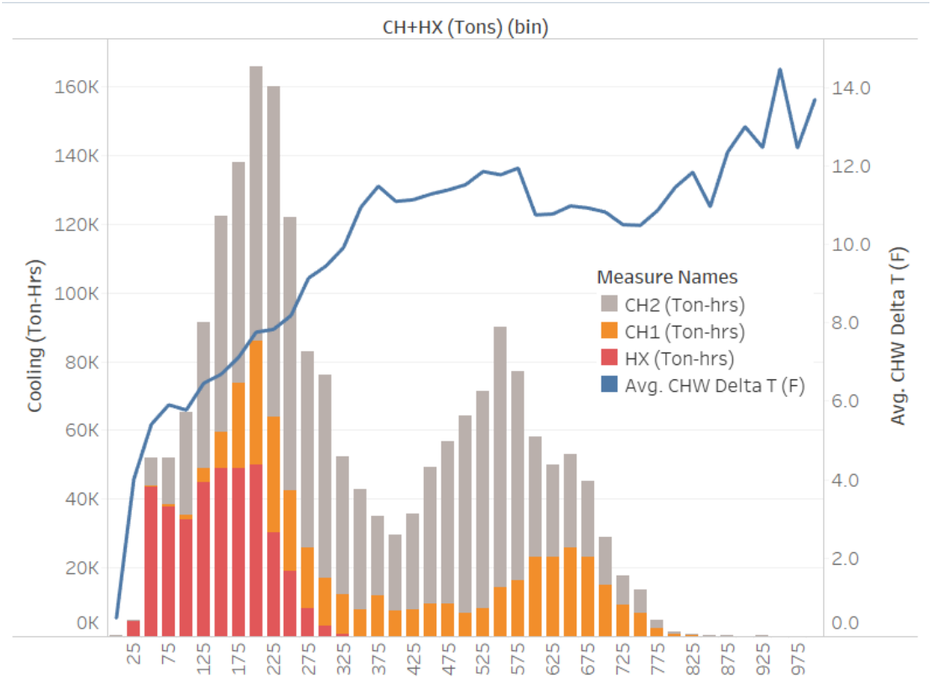
Hospital Results

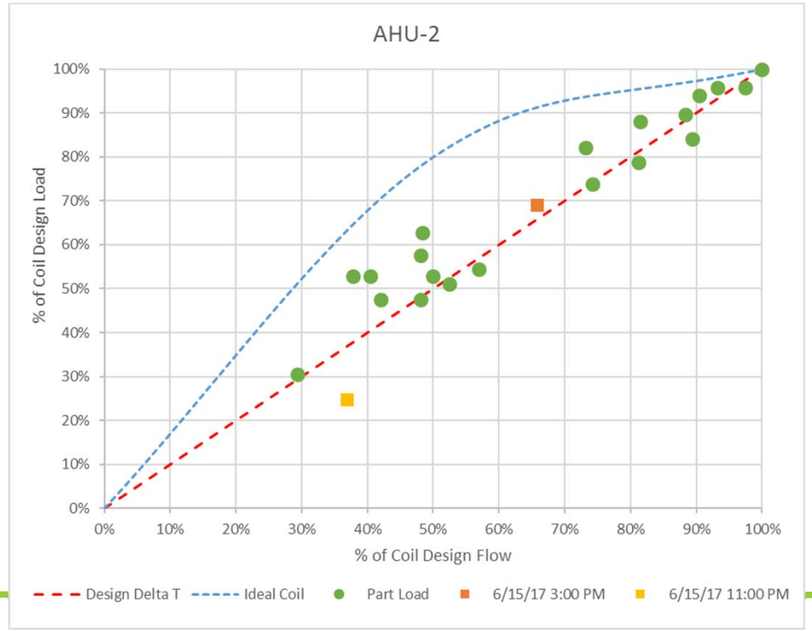
- Higher campus delta T
- Lower peak load and fewer running chillers
- Increased “export” capability between different plants
- More effective plant optimization
- Simplified commissioning



Current Assessment

- Next generation technology assessment follows similar progression
- Higher resolution data provides more in-depth analysis
- Coil analytics drive further into system performance to develop targets
- M&V and continuous commissioning built-in with instrumentation, analytics and fault detection





FlowEnergy Surge

RFI/RFP: NYC DCAS

- NYC Department of Citywide Administrative Services (DCAS)
  - Energy Management for 4,000+ buildings
  - Facilities management for 55 public buildings
  - Aggressive goals for energy efficiency and greenhouse gas reduction

Cast the Net

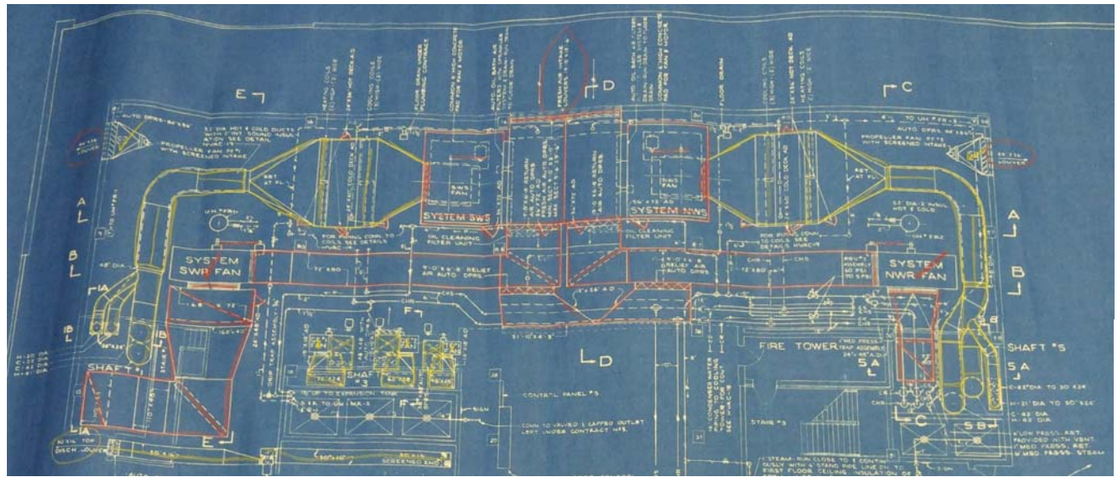
Innovative Demonstrations for Energy Adaptability (IDEA)

- Seeks technology that is commercially viable and available, but relatively new to the NYC market or HVAC industry
- Turnkey installations & one-year performance assessment
- Phase I complete, Phase II & III underway

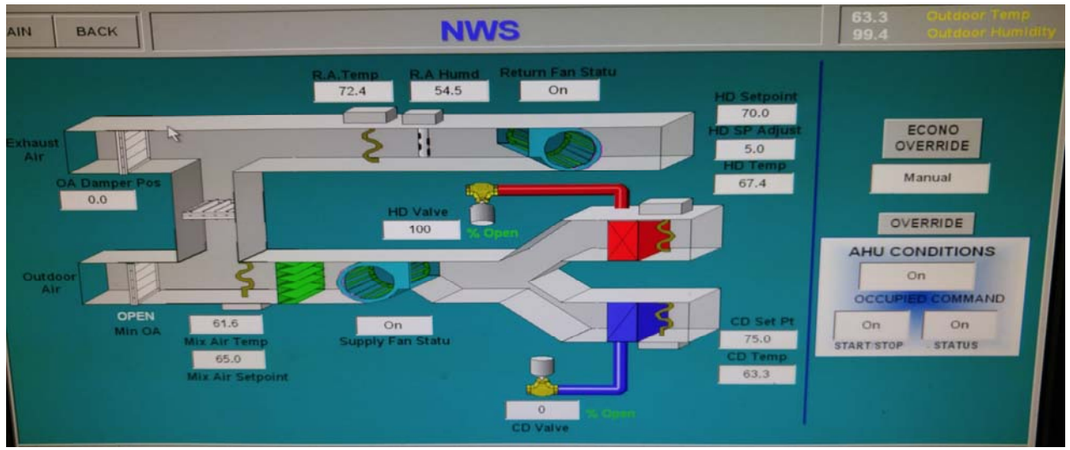
IDEA Program Anticipated Phases		
Phase I	Building Controls	Completed
Phase II	Energy Storage & Grid Solutions	Underway
Phase III	HVAC Optimization	Underway
Phase IV	Innovations in Renewable Energy	Underway

Assessment & Selection

- Multiple site visits and coordination to select the final location:
  - Manhattan Civil Courthouse
- Limited data, old building automation system, IT security concern
- 4x dual duct AHUs, 58,000 CFM, 550 GPM each

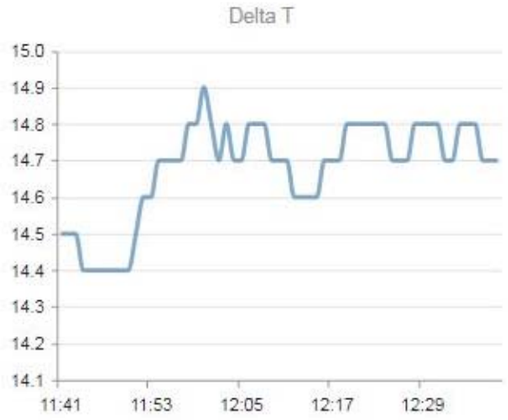


Project Status



- Installation finishing mid-June, 2018
- Assessment will run from 2018-2019

	Design	Actual
EWT	45.0	44.5
LWT	54.9	59.2
DT	9.9	14.7
Flow	272.0	55.5
P1	25.0	39.5
Δ P1-P2	3.0	3.7
P3	15.0	25.4
Δ P1-P3	10.0	14.2
Remote DP	0.0	--

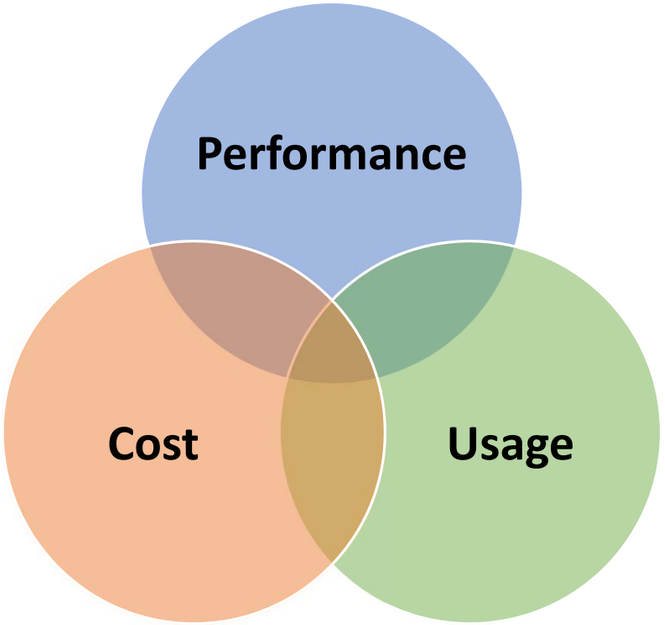


Project Goals:

- CHW optimization
- Improve space comfort
- 15% reduction in electrical energy consumption
- Provide enhanced monitoring, control and fault detection

Lessons Learned

- Where to start?
  - Use resources – utilities, peers, conferences
  - Find the right location
- Starting small is okay
  - Understand the impact of scale – is there a tipping point?
  - Set targets you can measure
- Action is better than inaction
  - Strive for improvement
  - Technology is always advancing!



Q&A // THANK YOU

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