Reduce Peak Demand and Increase Grid Stability with On-Site Energy Storage

AASHE 2018 Presentation 0568

By Austin Community College District's
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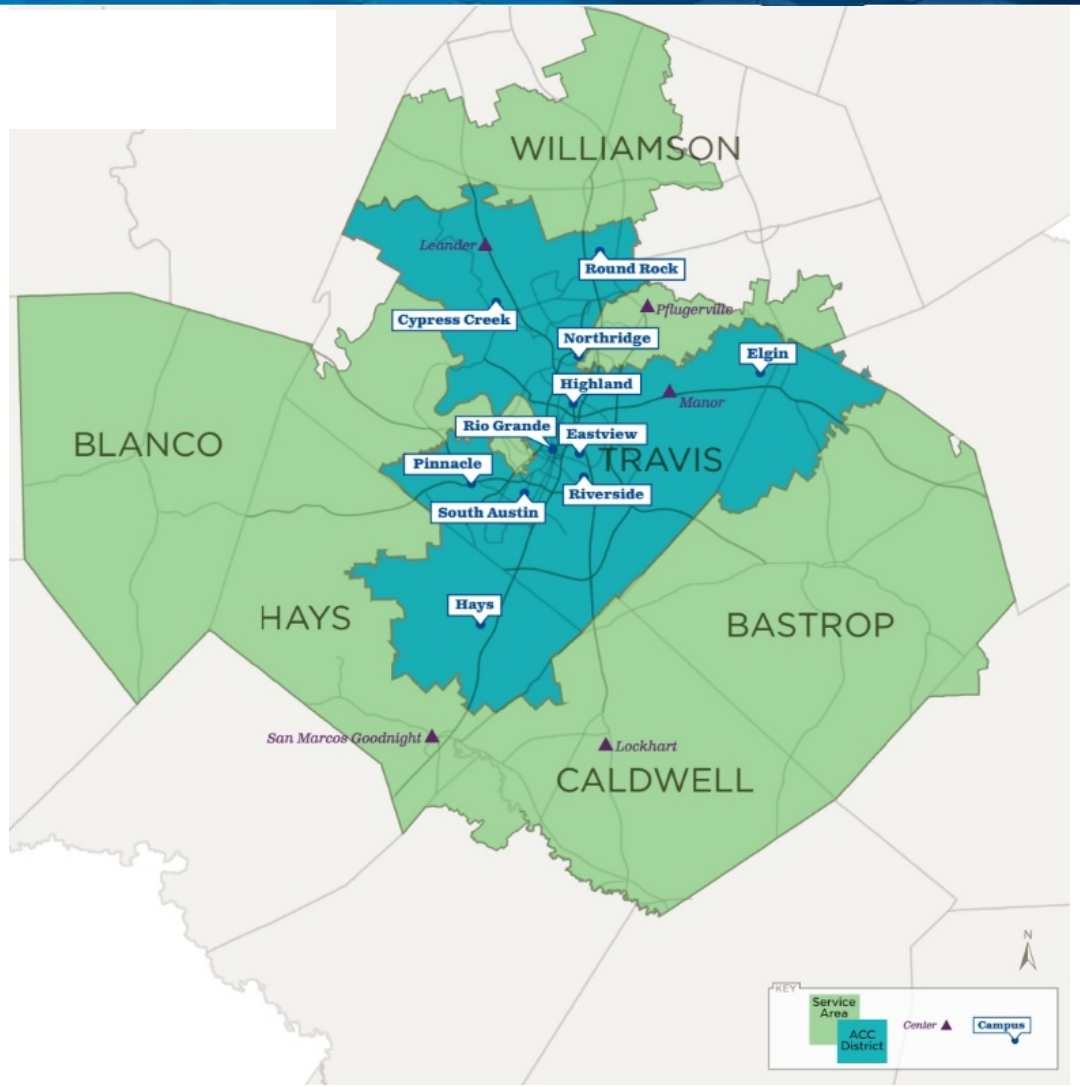
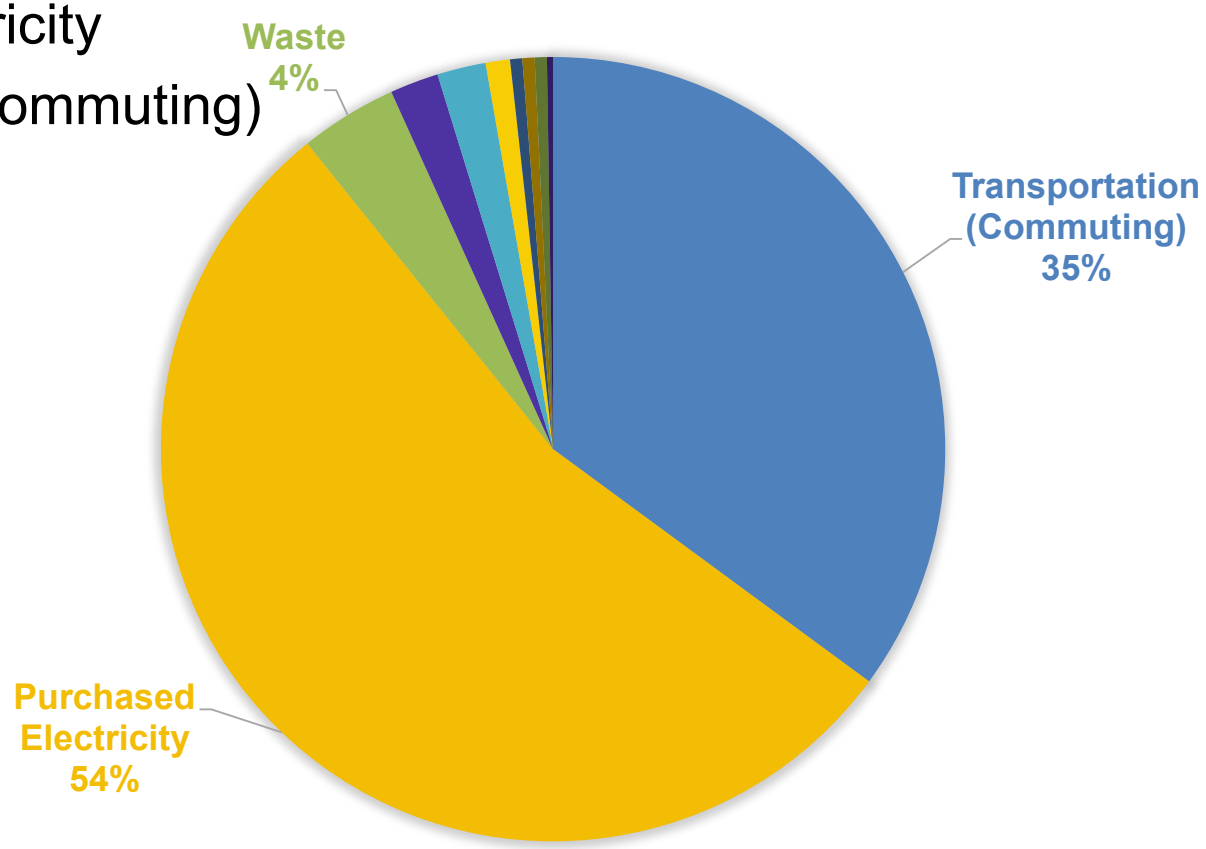
ACC District Overview

- 11 instructional campuses
- 2 admin centers
- 41,000+ credit-seeking students
- 15,000+ students in non-credit programs
- 2,300+ faculty and staff
- 2 campus expansions underway



Greenhouse Gas Inventory

- The Big 3:
  - Purchased Electricity
  - Transportation(Commuting)
  - Waste



ACC's 1MW Solar Portfolio

ACC Rio Grande

ACC Riverside

ACC Eastview

ACC Elgin

ACC Highland

ACC Northridge

SHINES - Batteries

ACC San Gabriel

ACC Round Rock

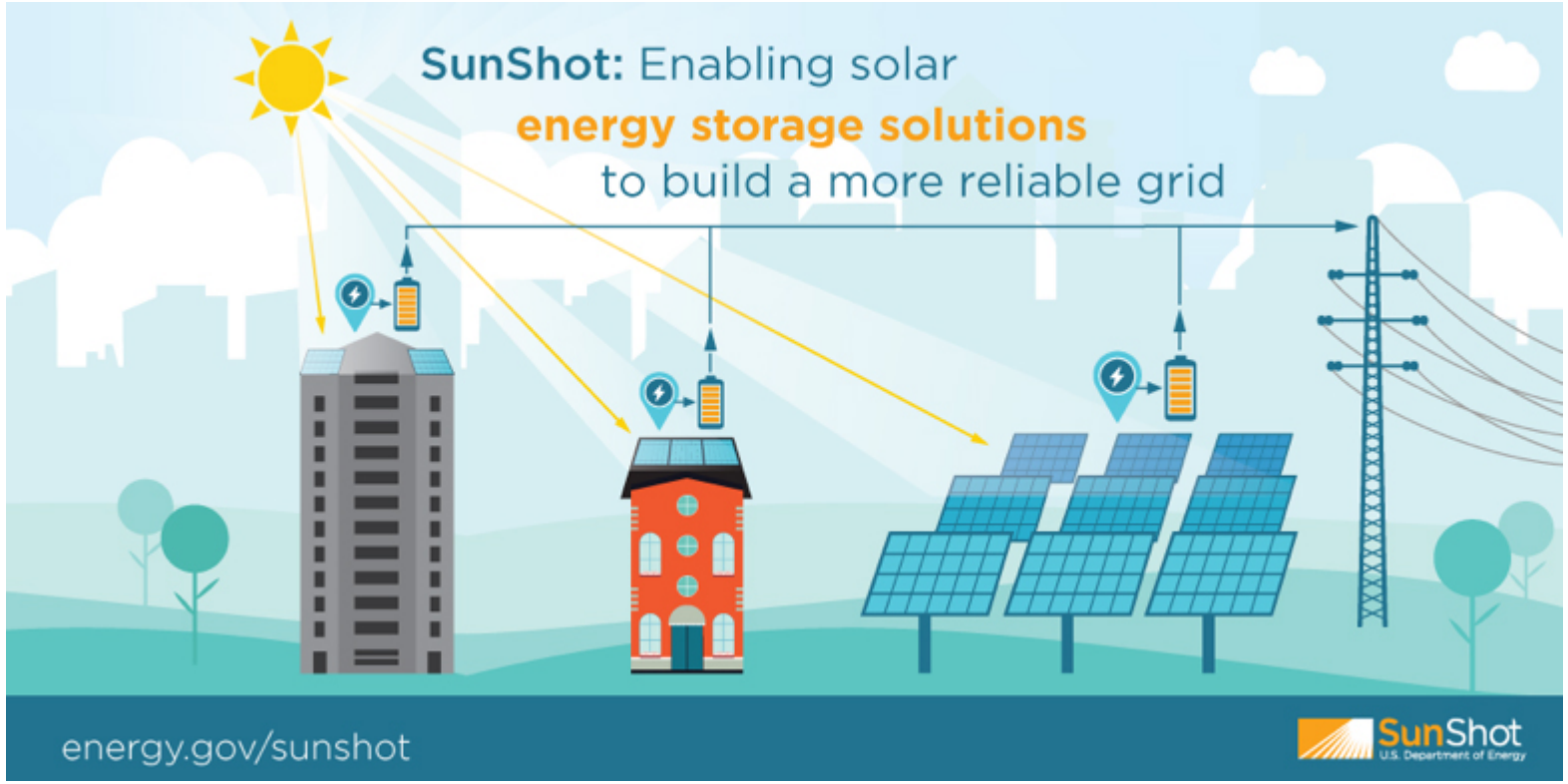
What is SHINES?

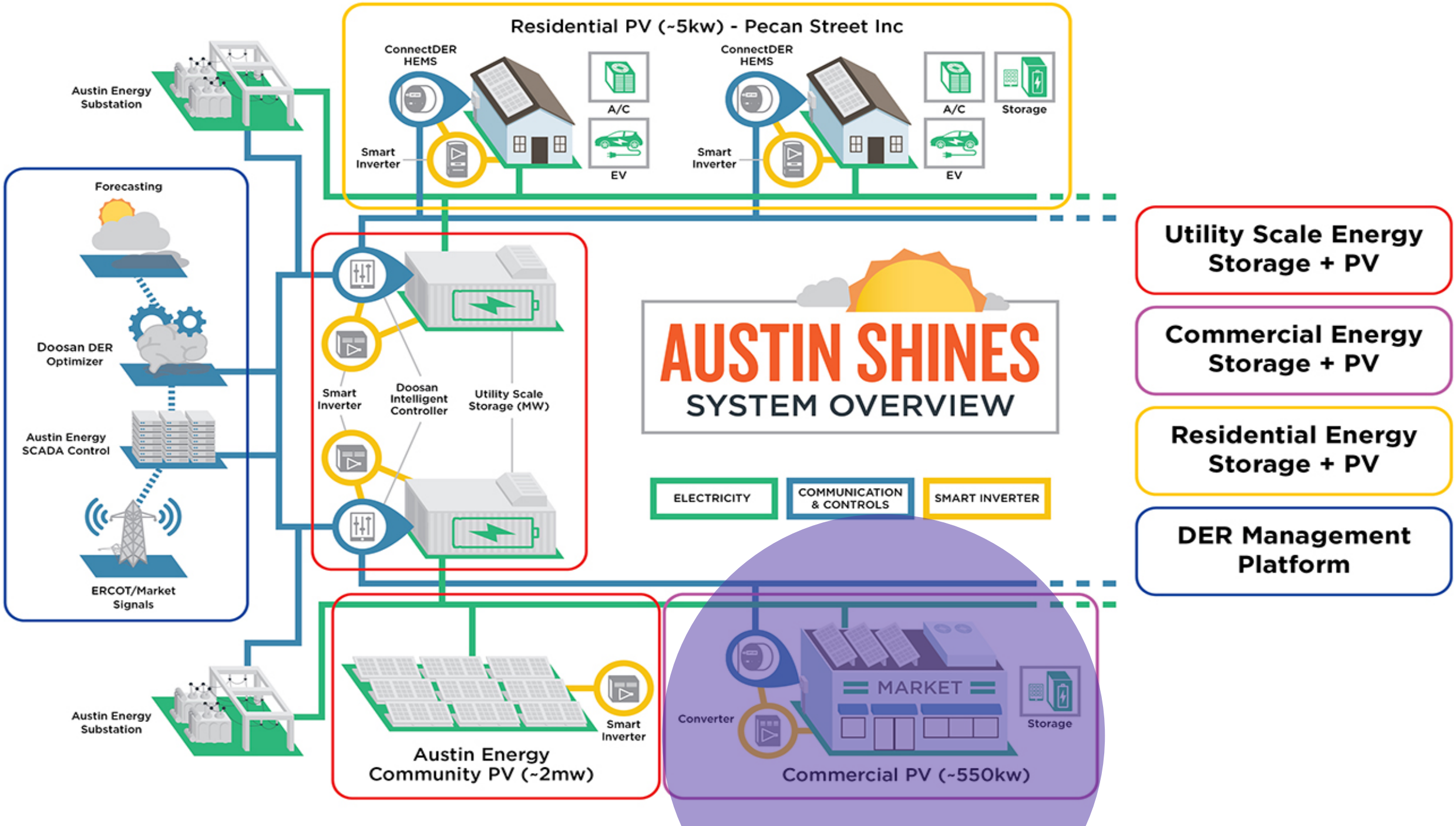
- SHINES: Sustainable and Holistic Integration of **Energy Storage** and **Solar**
- Three-year project funded by the
  - U.S. Department of Energy Sunshot Initiative ($4.3 million)
  - the Texas Commission on Environmental Quality
  - Austin Energy ($4.3 million)

Powered by SunShot U.S. Department of Energy

A Nationwide Approach

- Collaborative national effort
- Make solar cost-competitive with traditional energy sources
- Drive down the cost of solar electricity to $0.06 per kilowatt-hour




Residential PV (~5kw) - Pecan Street Inc
ConnectDER HEMS
A/C
EV
Smart Inverter
Storage
Austin Energy Substation
Forecasting
Doosan DER Optimizer
Austin Energy SCADA Control
ERCOT/Market Signals
Smart Inverter
Doosan Intelligent Controller
Utility Scale Storage (MW)
AUSTIN SHINES
SYSTEM OVERVIEW
ELECTRICITY
COMMUNICATION & CONTROLS
SMART INVERTER
Utility Scale Energy Storage + PV
Commercial Energy Storage + PV
Residential Energy Storage + PV
DER Management Platform
Austin Energy Community PV (~2mw)
Converter
MARKET
Commercial PV (~550kw)

Batteries are not new

Renewable Energy Backup

Vampiric to Renewable Supply

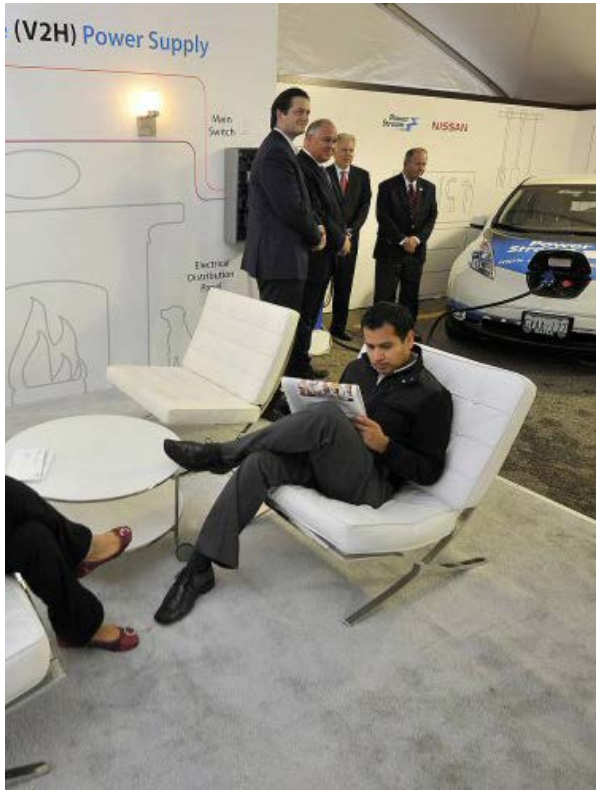
Commercial Backup

Grid Oblivious

Residential Backup

Flexible Operations

Vehicle 2 Home



Versatile Energy Solution

Austin Energy SHINES Goals

1. Demonstrate a solution adaptable to any region and market structure
2. Lower the overall system cost for solar energy and storage
3. Establish a template for other regions to follow
4. Mitigate potential negative impacts of high penetration levels of PV

ACC benefits

- Educational data
- Peak load reduction (demand charges!)
- Interesting solution
- Batteries could be ACC's to keep after 13 month evaluation period
- Interval metering
- Lower carbon energy solution?

Sustainable Development Goals

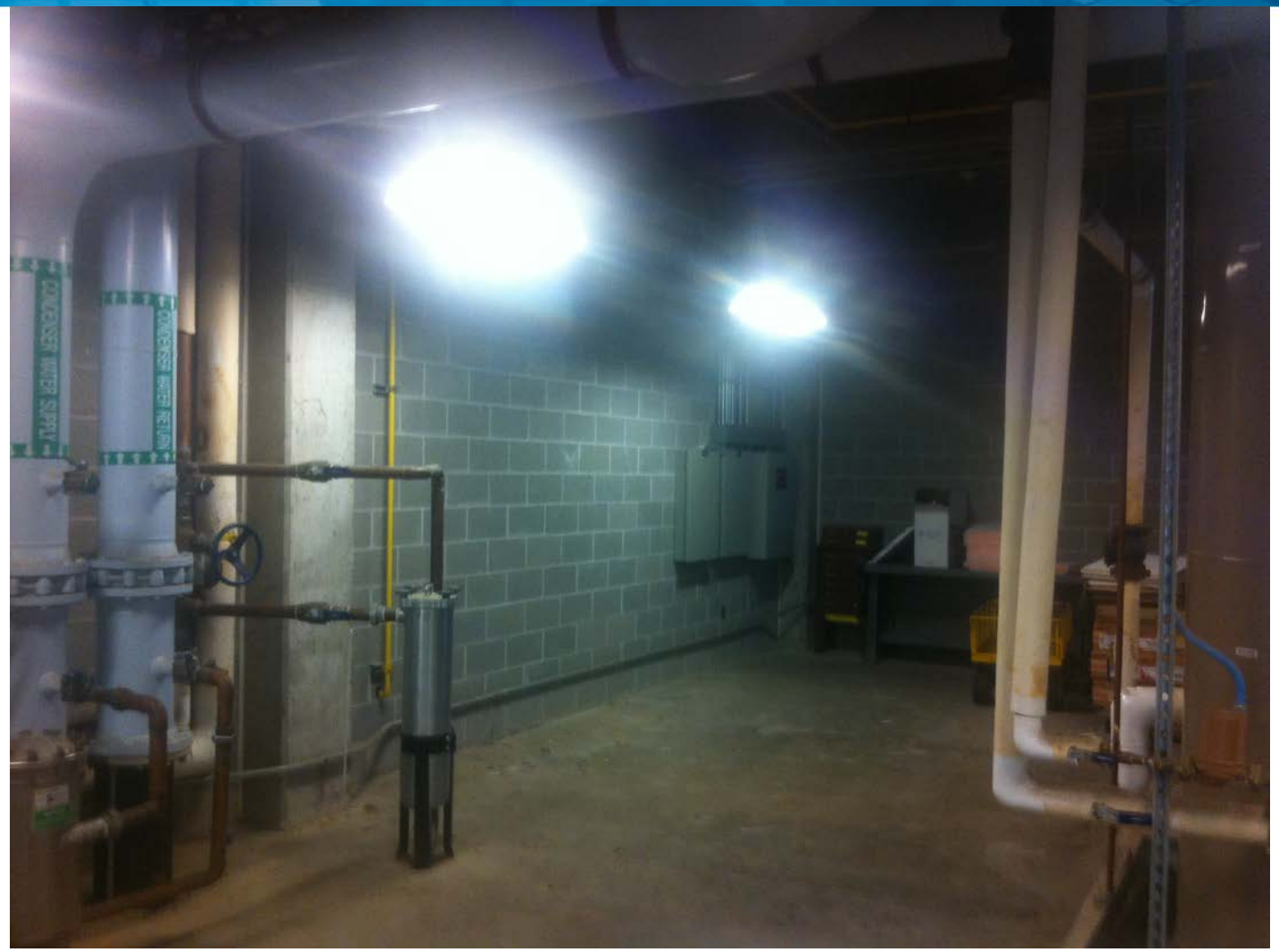
Beautiful Conditioned Space Placement

- Flexible product
- Quiet
- Indoor Fire Rating
- Aesthetically pleasing

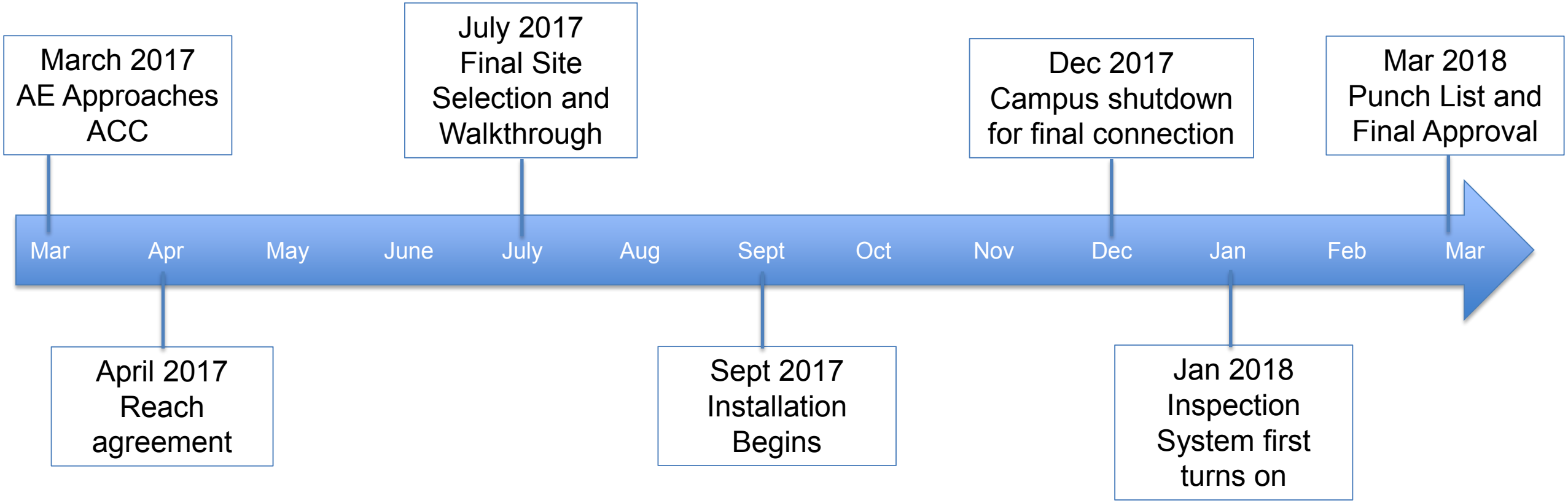
ACC's Installation

- Eastview Campus
- 72 kW of batteries
- Stand-alone mechanical and electrical building
- Concrete curb mounted
- No network connection requirement (cellular)

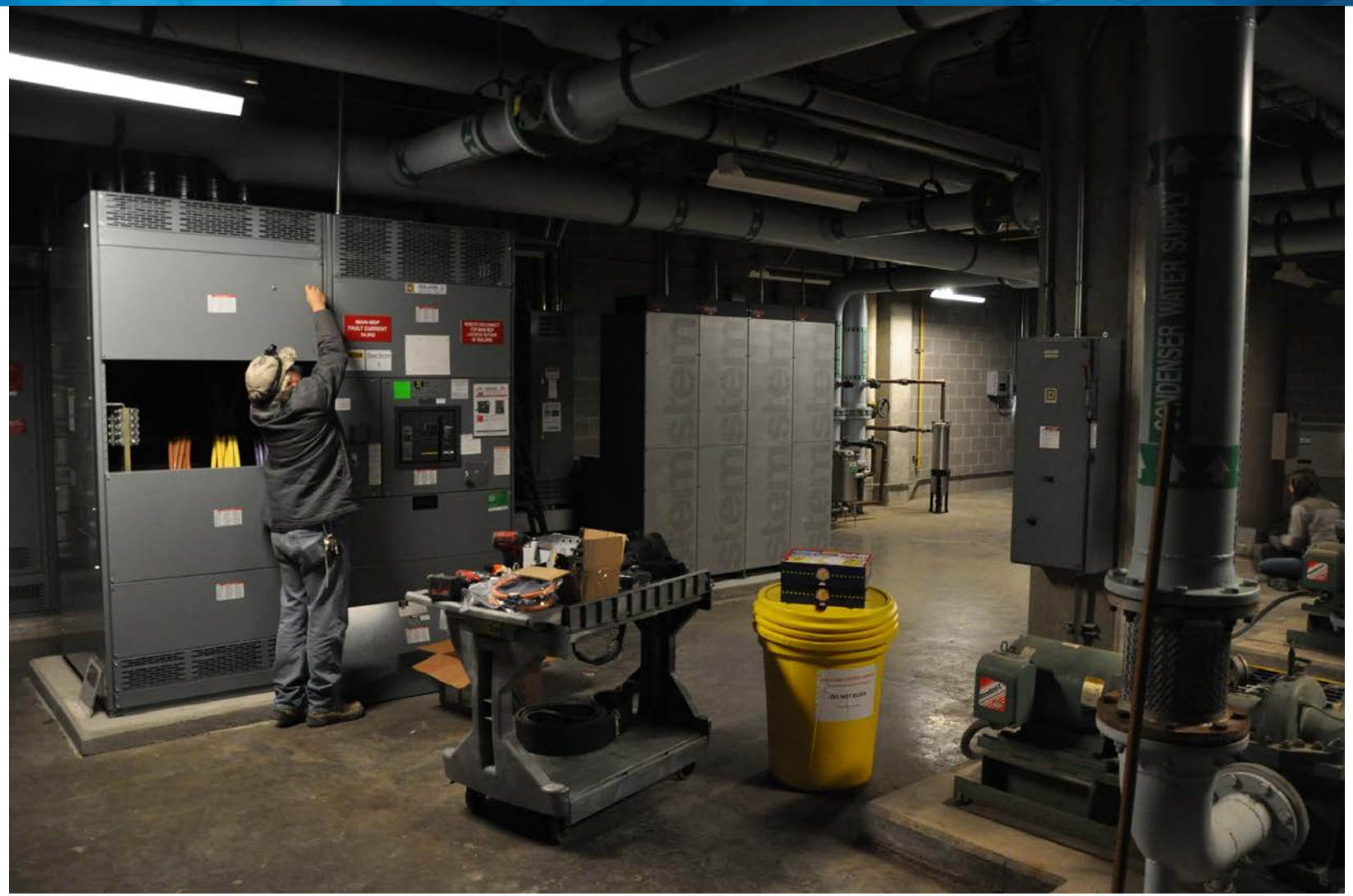
The Mechanical Electrical Closet



Timeline of Installation



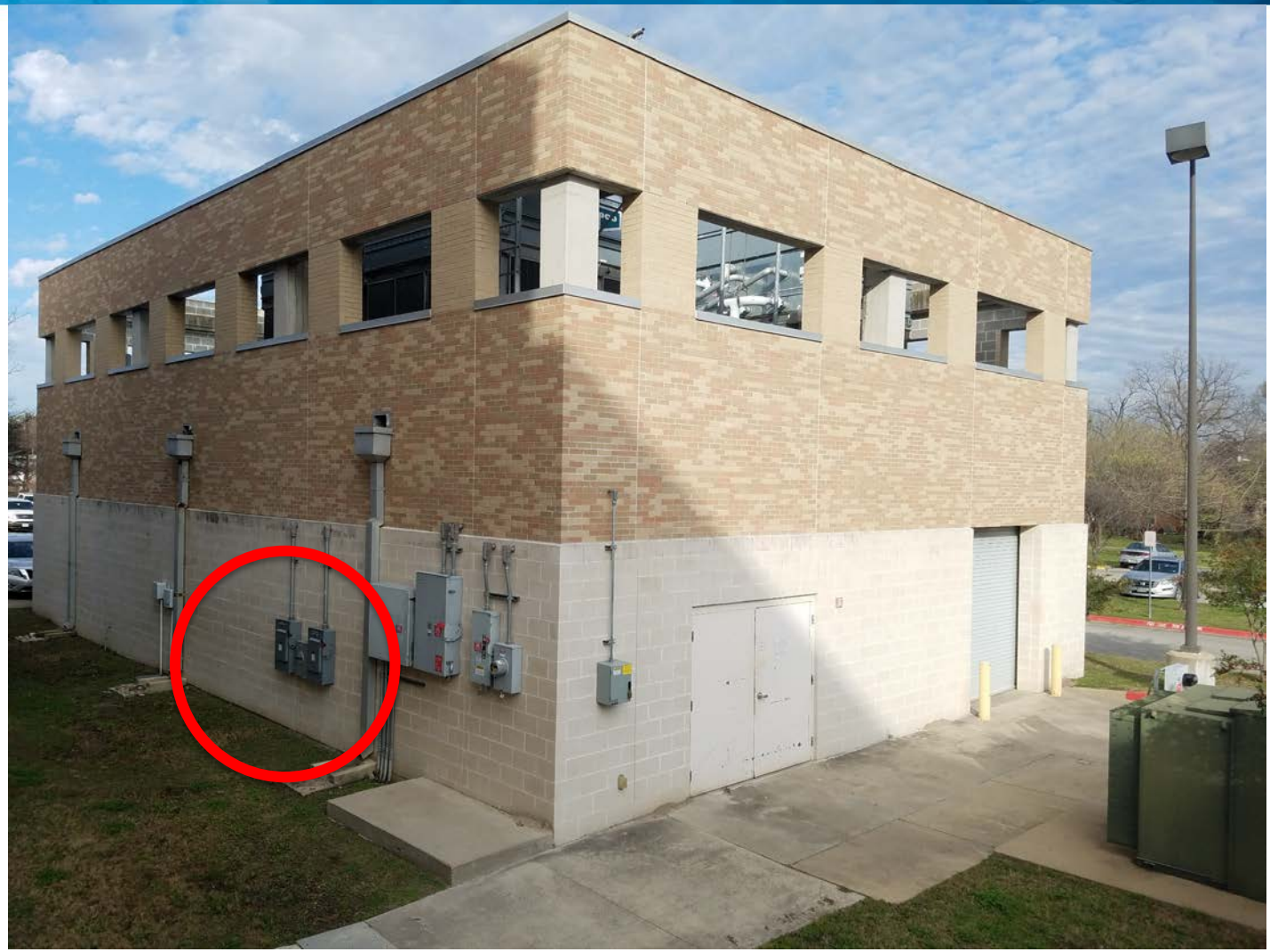
Installation



Final Product

A word on Safety

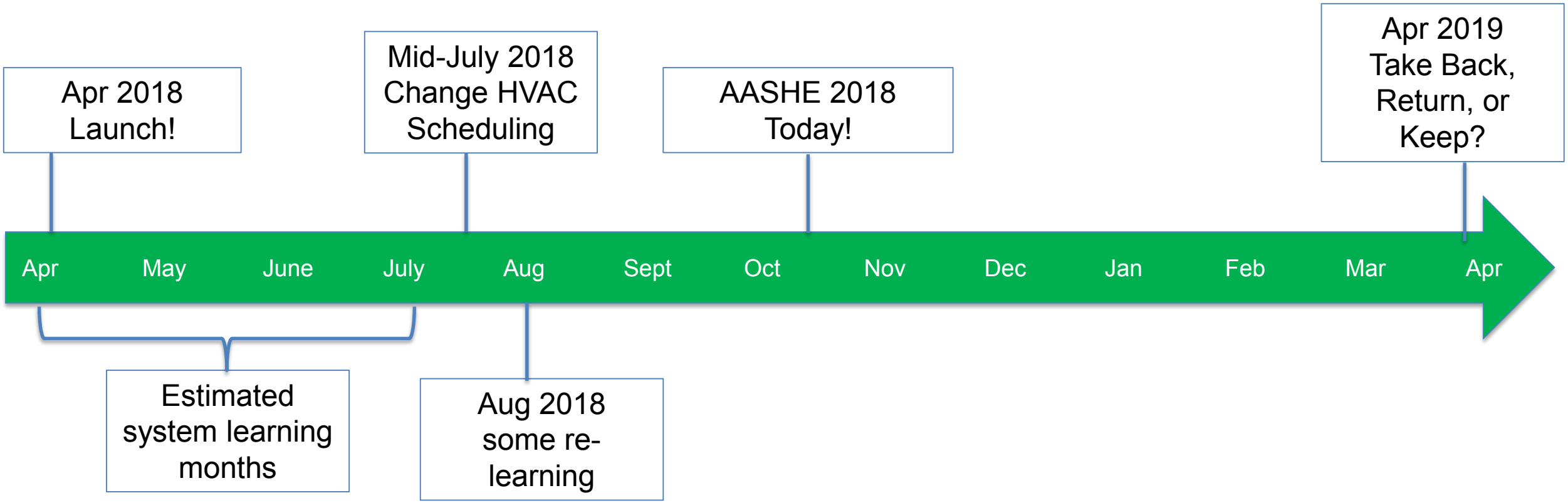
- Disconnects



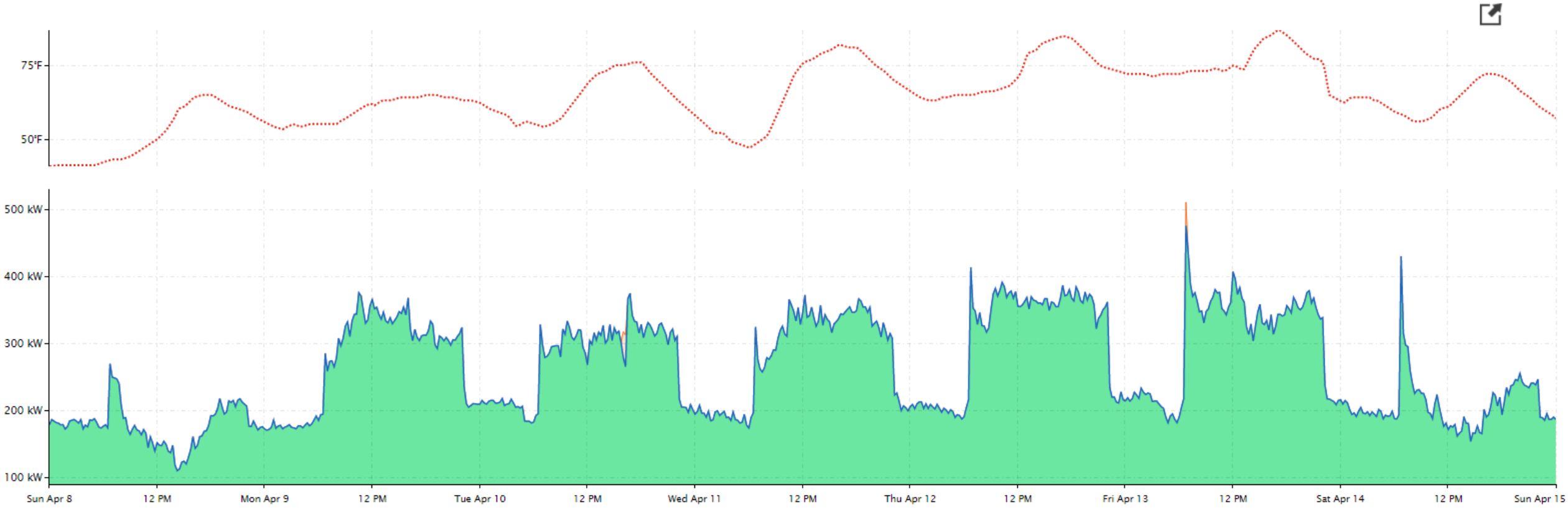
More than a hardware solution!

- Power management
- Learning algorithms
- Cloud networked software controls

Evaluation Period

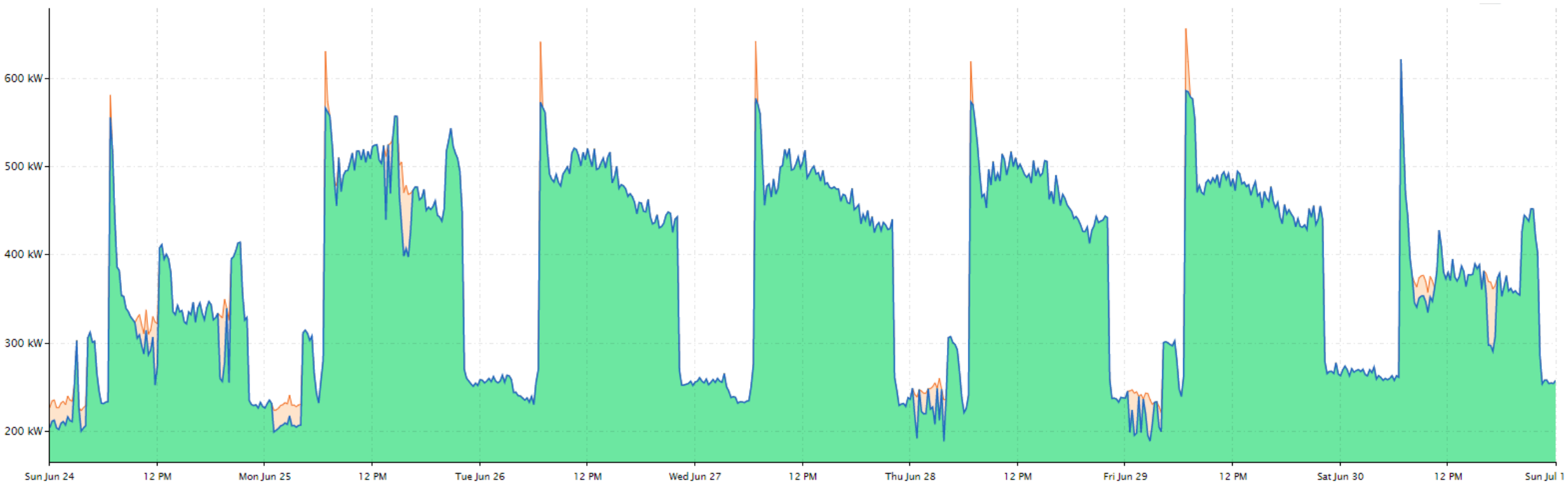


April's Chilly Launch

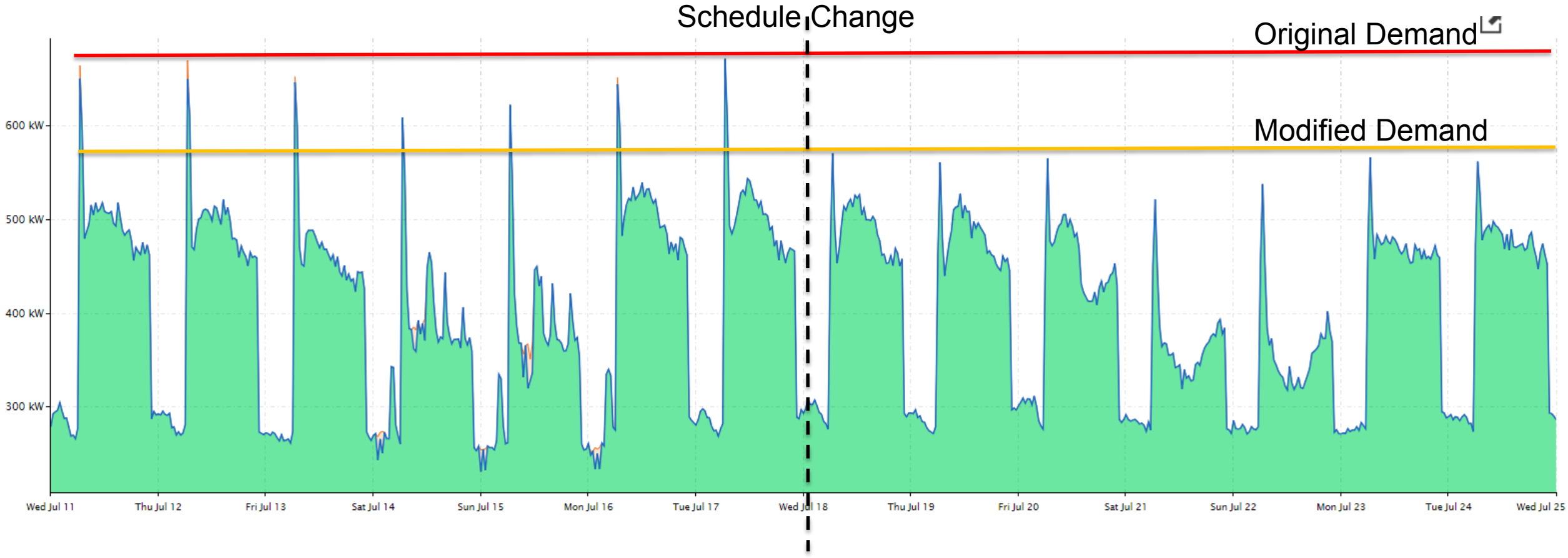


May Learning Outputs

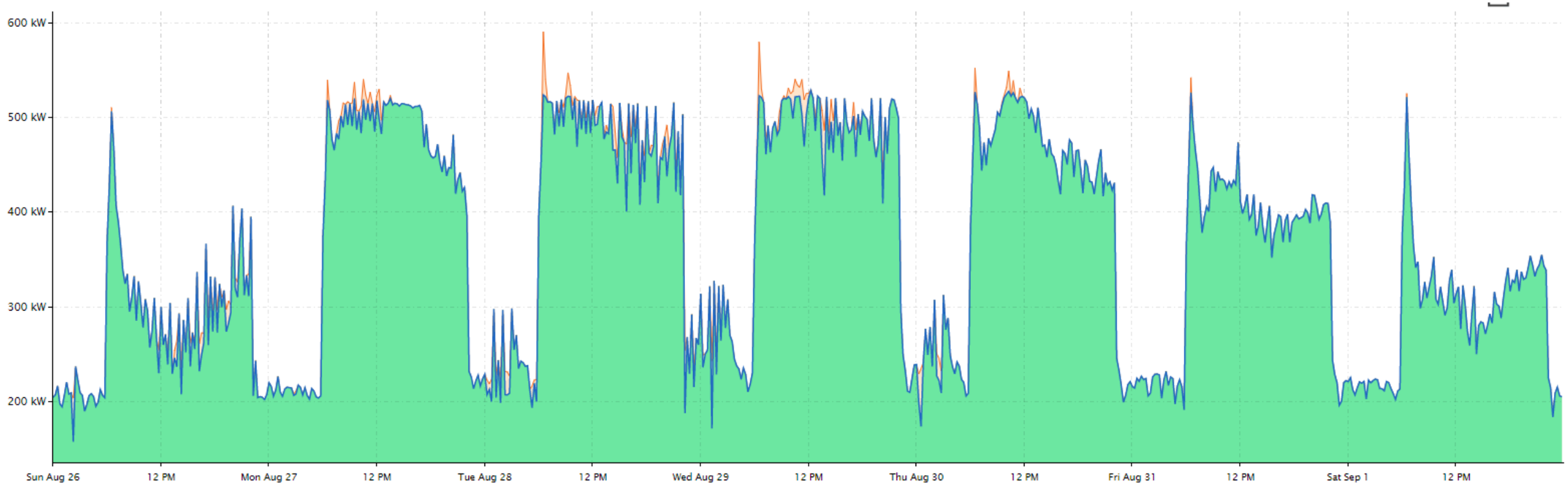
Deeper Discharges in June



July Schedule Change



Re-Learning in August



Demand Savings

Demand Costs Calculations	kW	Electric Delivery	Demand Charge	Regulatory	Total Charge
With SHINES	570	$4.50	$6.40	$3.80	$8,379.00
Without SHINES	650	$4.50	$6.40	$3.80	$9,555.00
Best Case SHINES Savings					$1,176.00
Schedule change	100	$4.50	$6.40	$3.80	$1,470.00

Questions & Discussion

SHINES Energy Storage

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