



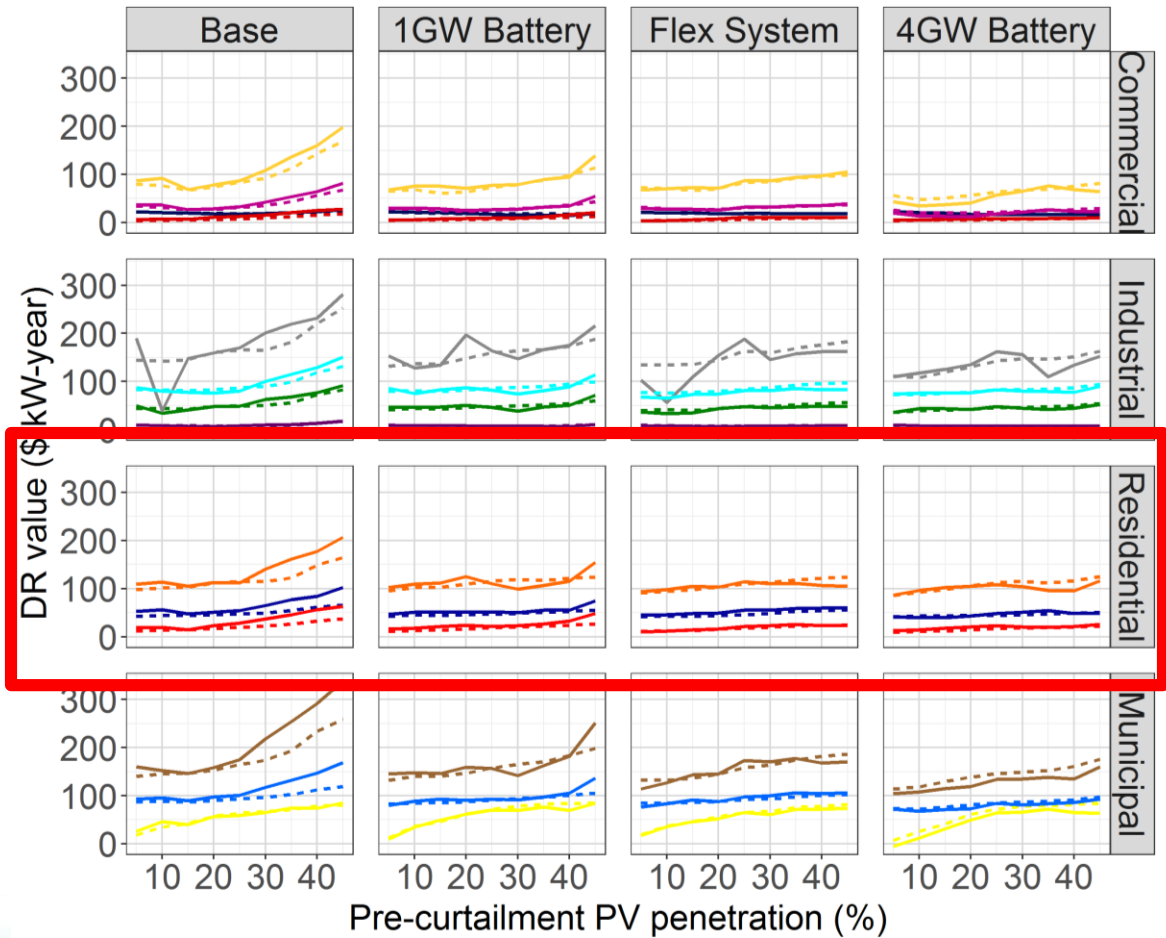
Grid-Integrated Water Heater Control for the 21st Century



Aquanta Inc.
1775 Tysons Blvd, 5th Fl
Tysons, VA 22102
www.aquanta.io

Grid-Interactive Water Heating: Leading Enabler of Renewables

NREL 2017: “Demand Response Potential from the Bulk Grid Perspective”



DR Scenarios
 — Low DR
 - - High DR

- DR End Use
- Commercial cooling
 - Commercial heating
 - Commercial lighting
 - Commercial ventilation
 - Industrial agriculture
 - Industrial datacenters
 - Industrial manufacturing
 - Industrial refrigerated warehouses
 - Municipal outdoor lighting
 - Municipal wastewater pumping
 - Municipal water pumping
 - Residential cooling
 - Residential heating
 - Residential hotwater

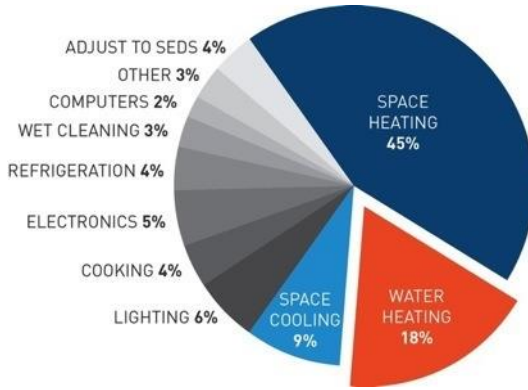


Bringing the Water Heater Installed Base Into the 21st Century

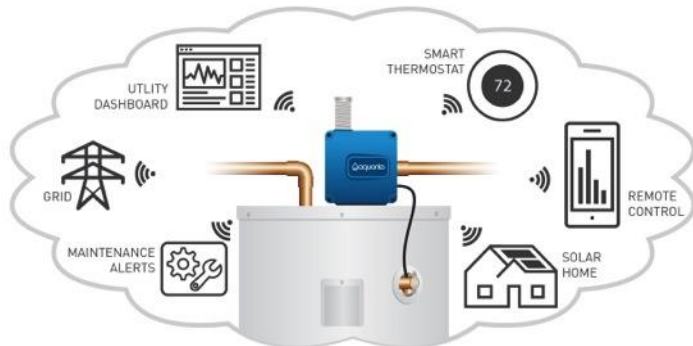
① Customer Value



② EE/ Cost Savings



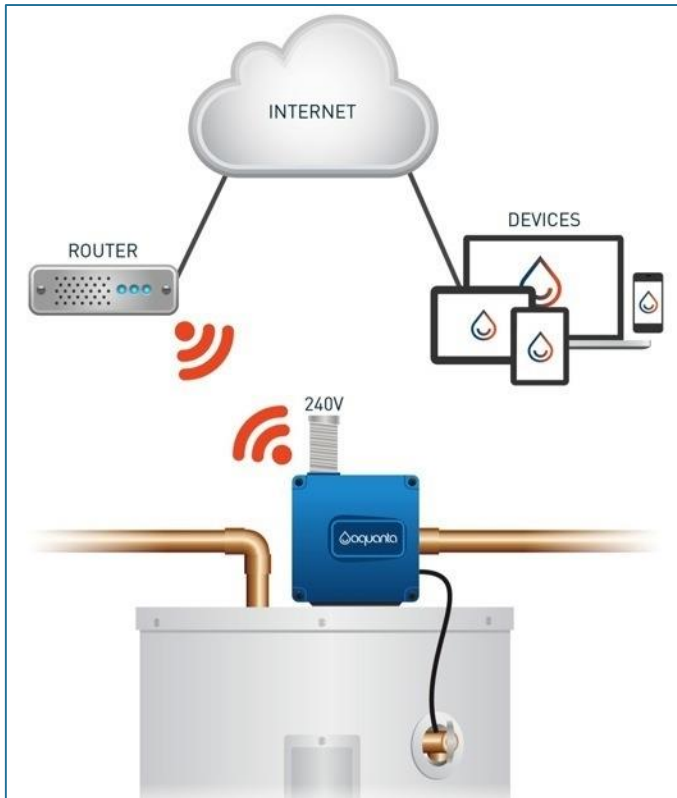
③ Grid Integration



Aquanta Water Heater Controller

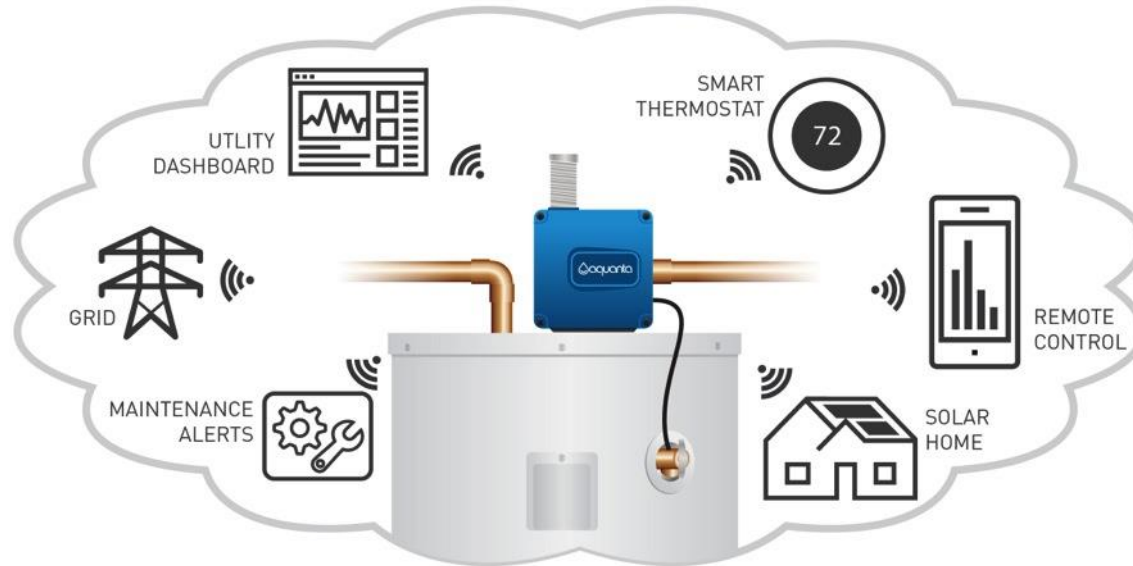


Aquanta Water Heater Controller



- ▶ **Networked, Smart Home Enabled**
 - Cloud-cloud integration w/ other platforms
- ▶ **Advanced Analytic Capabilities**
 - “Learning” algorithm
 - Enable and enhance Smart Grid
- ▶ **Easy, (Near-)Universal Retrofit**
 - < 60 min install; DIY-friendly
- ▶ **Electric and Gas WH Versions**
 - Compatible w/ 65-80% of US WH installed base

Aquanta Grid Integration Use Cases



- ▶ DR/capacity markets
- ▶ Enable TOU/variable pricing
- ▶ Storage/WH as battery
- ▶ Renewables integration
- ▶ Mitigate demand charges
- ▶ Whole home energy management

Enabling Diverse DSM Use Cases

1. **Aquanta Fleet Manager**

- Load shifting, DR controls through fleet dashboard
- Fleet O&M – device monitoring, alerts, Tier 1 support enablement
- M&V – predictive analytics & post-event reporting

2. **Integration w/ Utility & 3rd Party DERMS/DRMS**

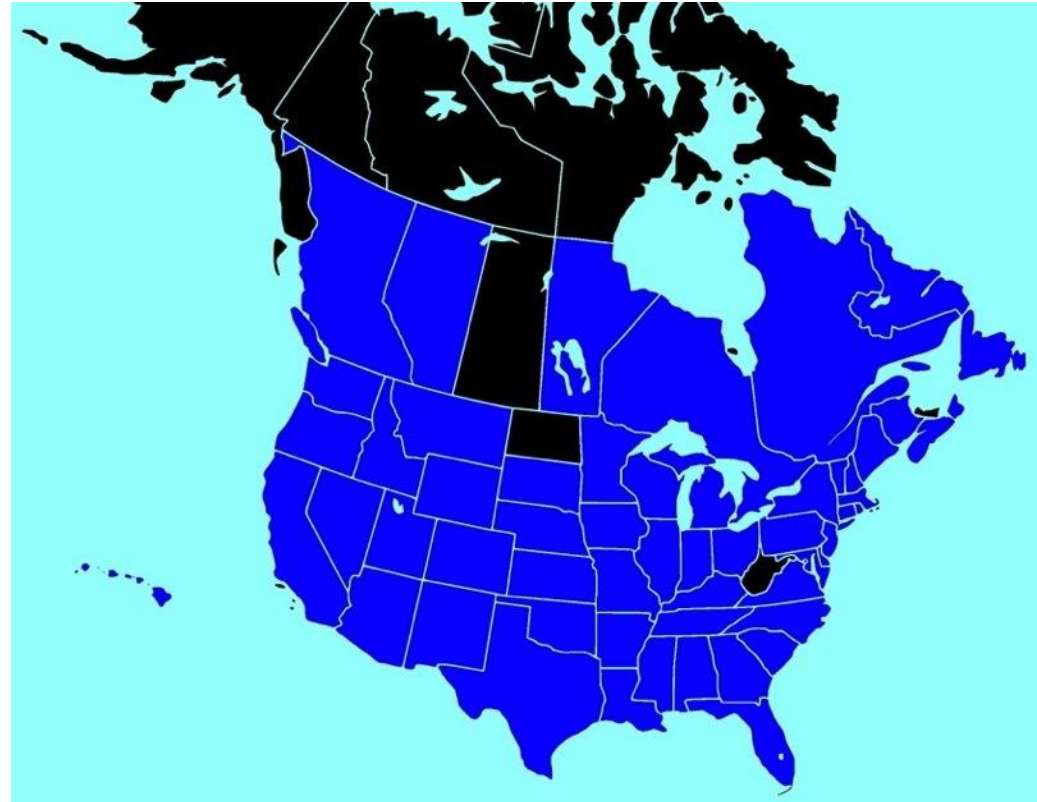
- Full range of grid management use cases
- Cloud-cloud integration via Aquanta API
- OpenADR 2.0-enabled

3. **Automated TOU**

- Aquanta TOU Scheduler feature optimizes water heating to pre-loaded TOU schedules & rates

Aquanta Highlights: Commercial

- Units in 48 States, 8 Provinces (ship start 9/16)
- #1 Google Search Rank
- 3 Dozen+ Utility Trials
- Distribution Partnership w/ NRTC
- Major Utility Programs
 - GMP (VT), PGE (OR)
 - AEP (OH), Tri-County Electric (TN)



Use Case: Automated TOU

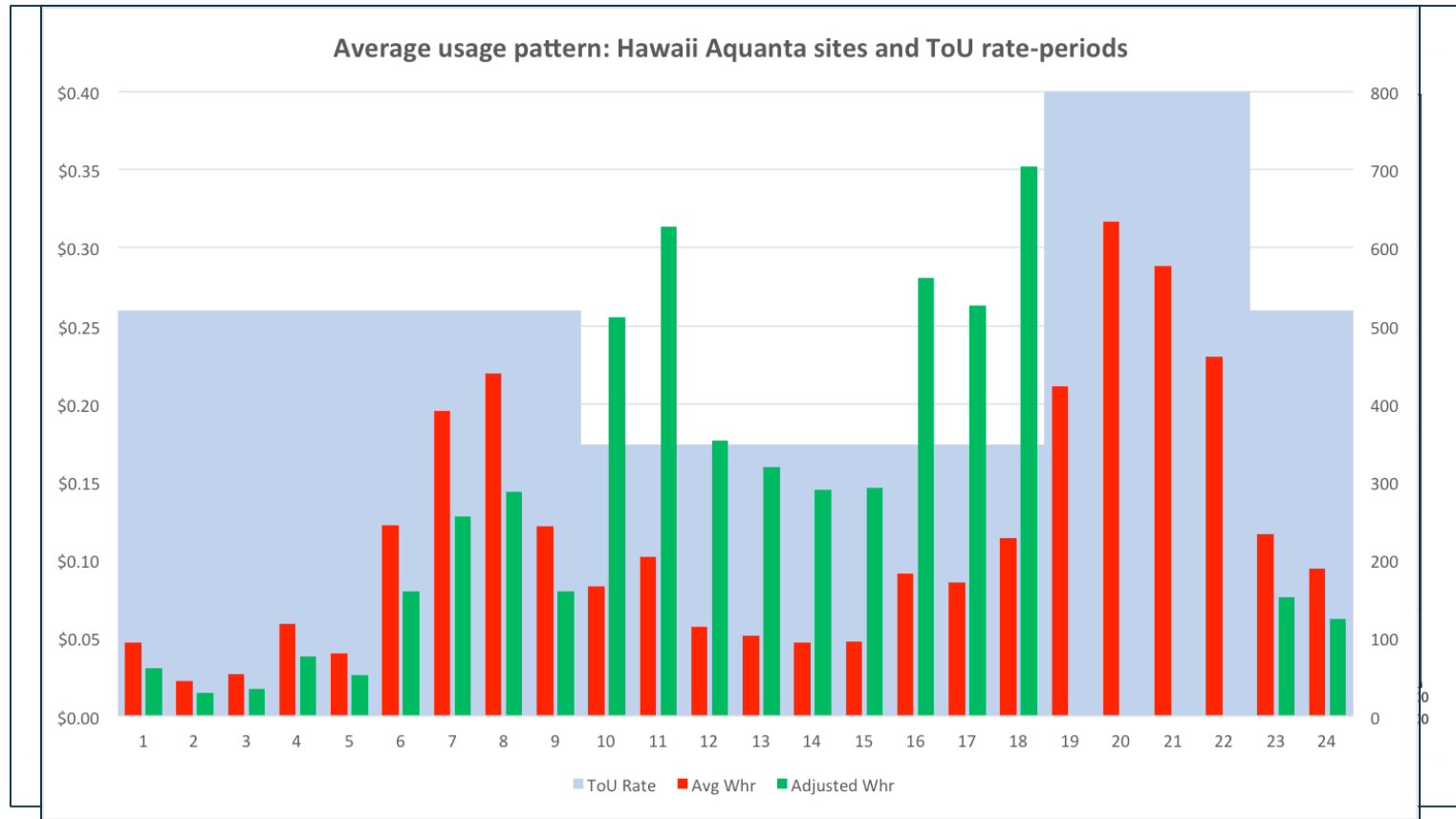
“The future is dynamic pricing enabled by smart technology that brings variable renewables and DER onto the grid at the right time and the right price.”

- Brattle Group (2017)

- Aquanta optimizes to maximize off-peak heating & minimize peak heating

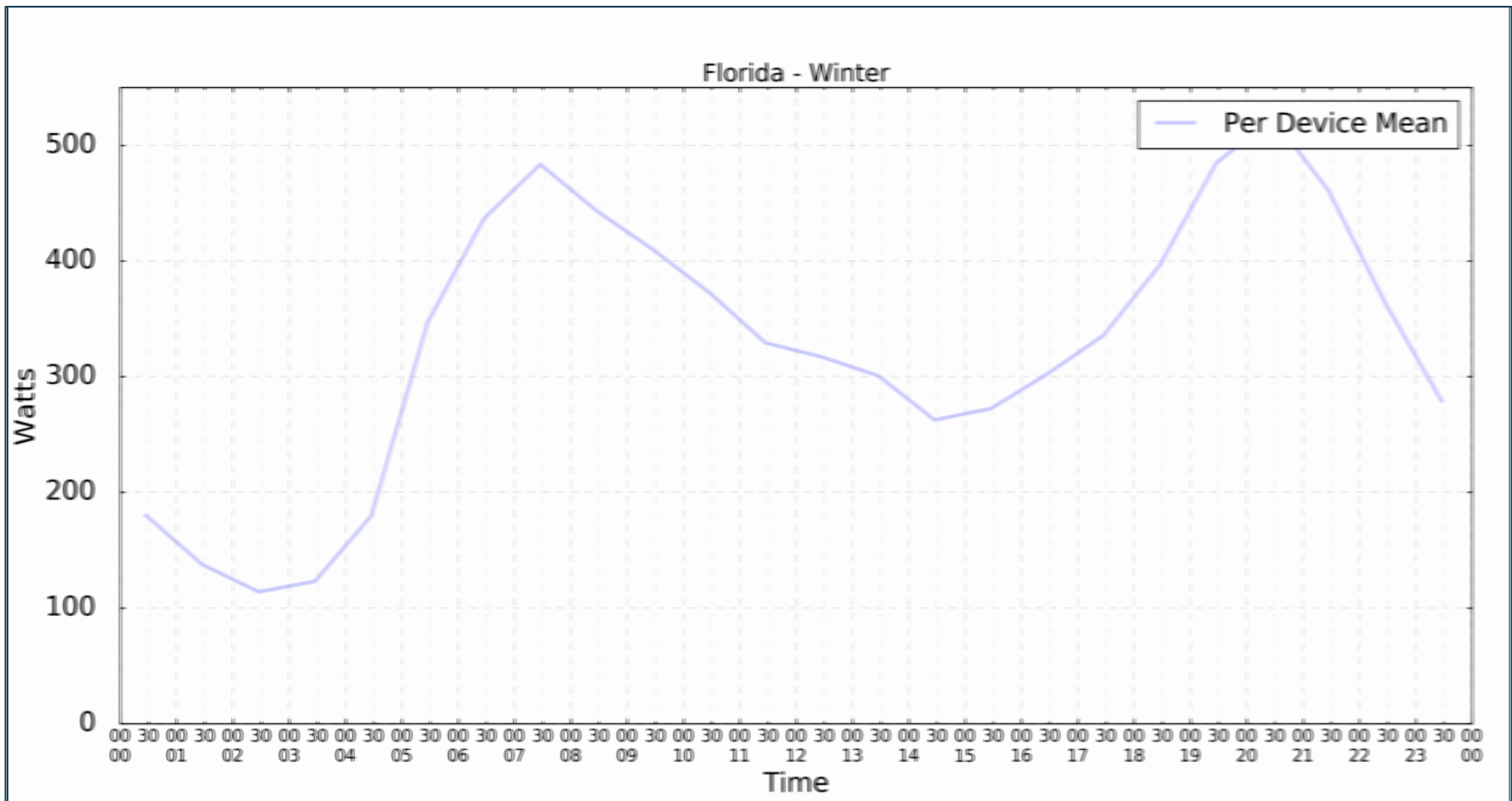


Case Study: TOU in Hawaii

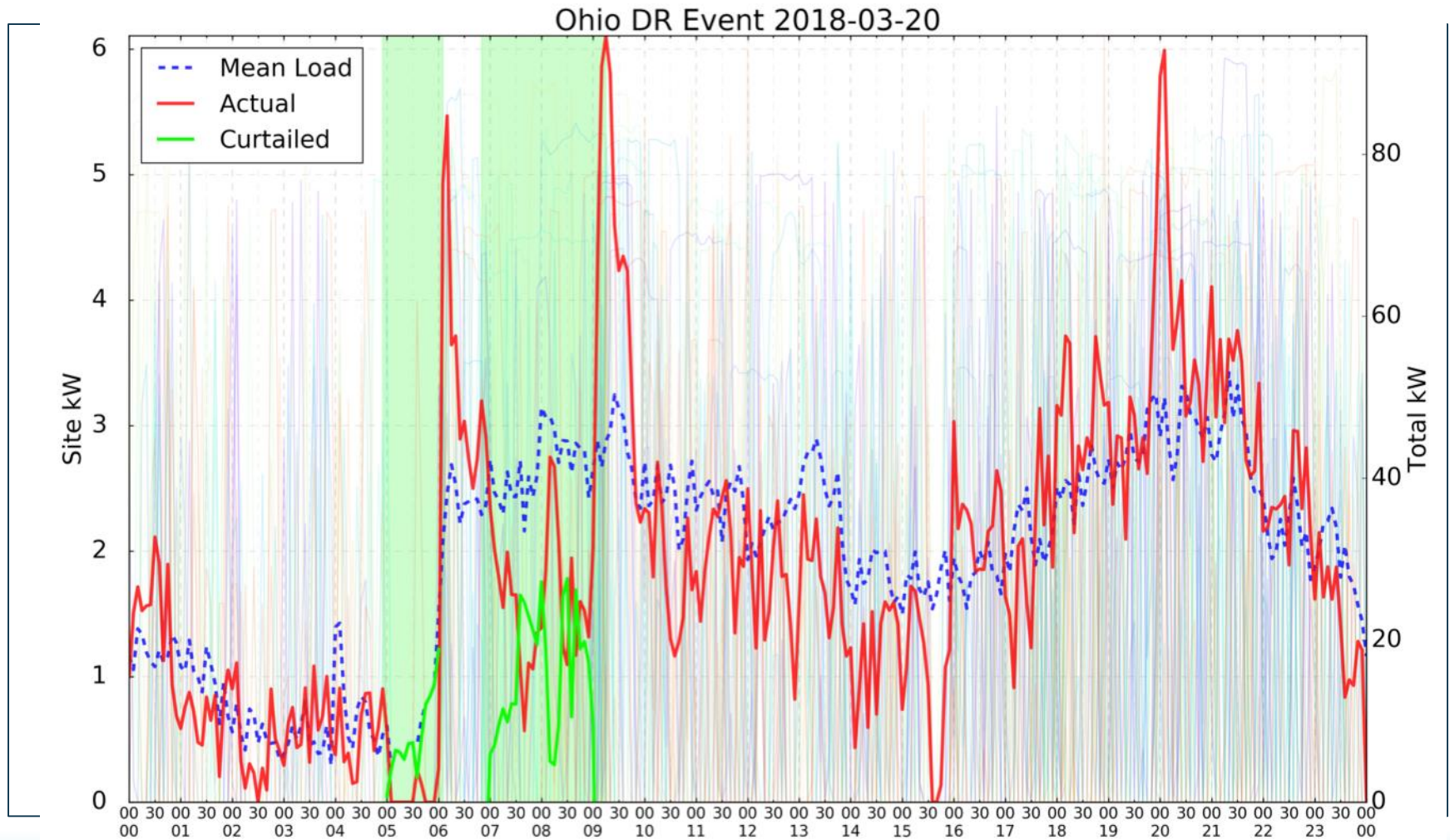


Total Annual Cost without ToU Shifting	\$ 593.56
Total Annual Cost WITH ToU Shifting	\$ 397.93
Annual Savings WITH ToU Shifting	\$ 195.62

Case Study: Summer vs Winter WH Load in FL



Case Study: DR in Ohio



More Use Case Opportunities

- ▶ Gas DR
- ▶ Water Heater Monitoring/Predictive Maintenance
- ▶ Integrated Home Energy Management
- ▶ Residential PV/Water Heater/Battery Integration & Coordination
- ▶ Thermostat/Water Heater Coordination



Thank You!

Matt Carlson
CEO
matt@aquanta.io