REYNOLDS LANDING

AT ROSS BRIDGE

Alabama Power

SMART NEIGHBORHOOD™

Tomorrow's Homes. Today.

Who we are

America's premier energy company – providing clean, safe, reliable and affordable energy, and customized solutions

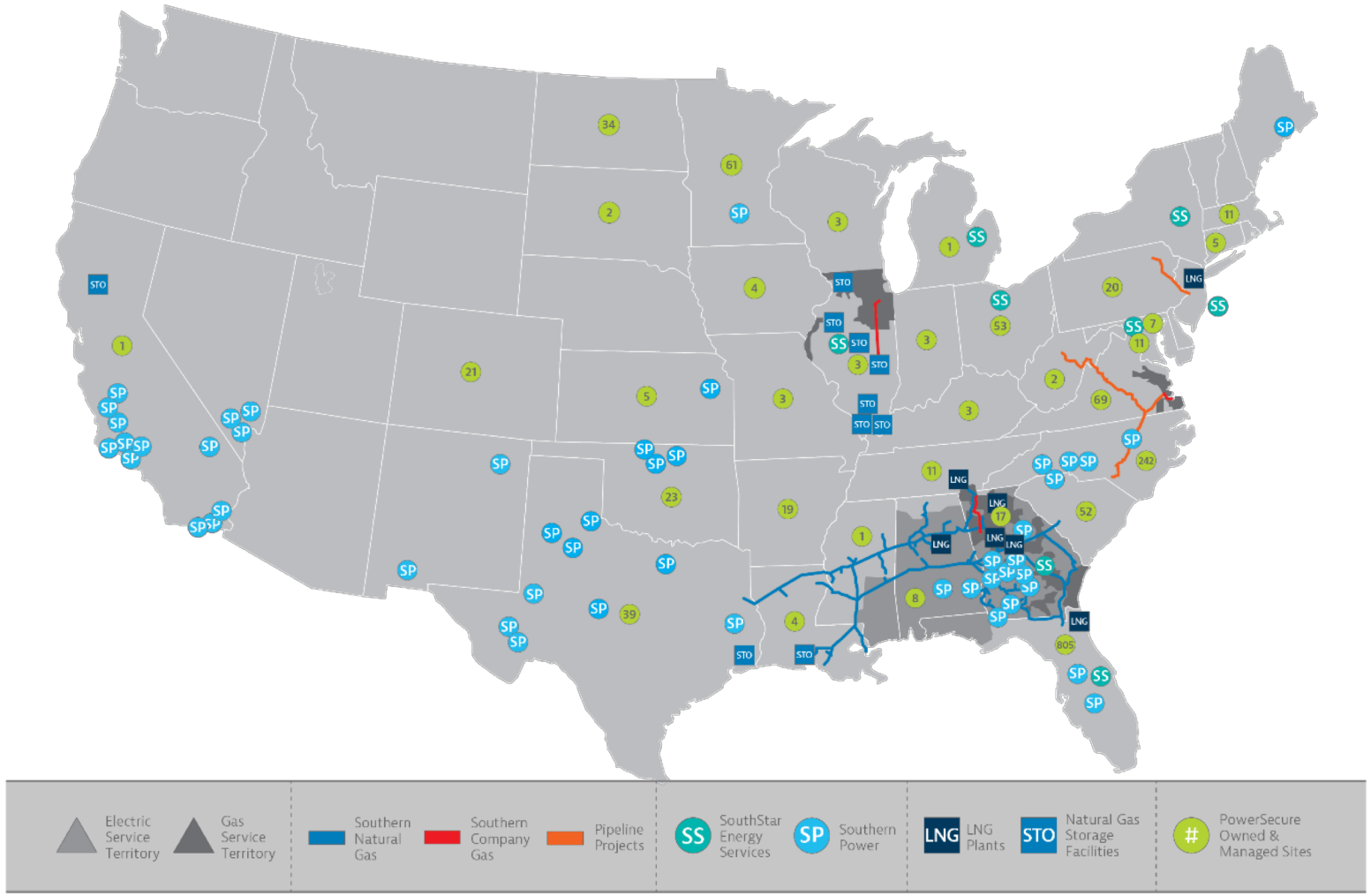
Southern Company

Approximately
46,000 MW
of Generating Capacity

Nearly
200,000 Miles
of Power Lines

More than
80,000 Miles
of Natural Gas Lines

170 Bcf
of Natural Gas Storage Capacity



8
Electric & Natural Gas Utilities

Approximately
30,000
Employees

9 Million
Utility Customers

Alabama Power

SMART NEIGHBORHOOD®

Objective

Design and build a first of a kind living laboratory to prepare APC for future grid needs and customer expectations

Scope

Demonstrate **distributed energy resources (DER)** use cases optimizing cost, reliability, and environmental impact with a **community-scale microgrid**

Demonstrate 62 **high-performance homes with connected home technologies** providing an improved customer experience

Demonstrate **building-to-grid integration** with real time utility to customer interaction

Objective:

Design and build a first-of-a-kind high-performance community and residential microgrid to learn how to better serve changing customer needs.

Demonstrate **62 high-performance homes** with connected home technologies providing an improved customer experience

PARTNERSHIPS

Alabama Power

SMART NEIGHBORHOOD®

Signature HOMES

Southern Company

OAK RIDGE National Laboratory

Carrier turn to the experts

EPRI ELECTRIC POWER RESEARCH INSTITUTE

Rheem The new degree of comfort.™

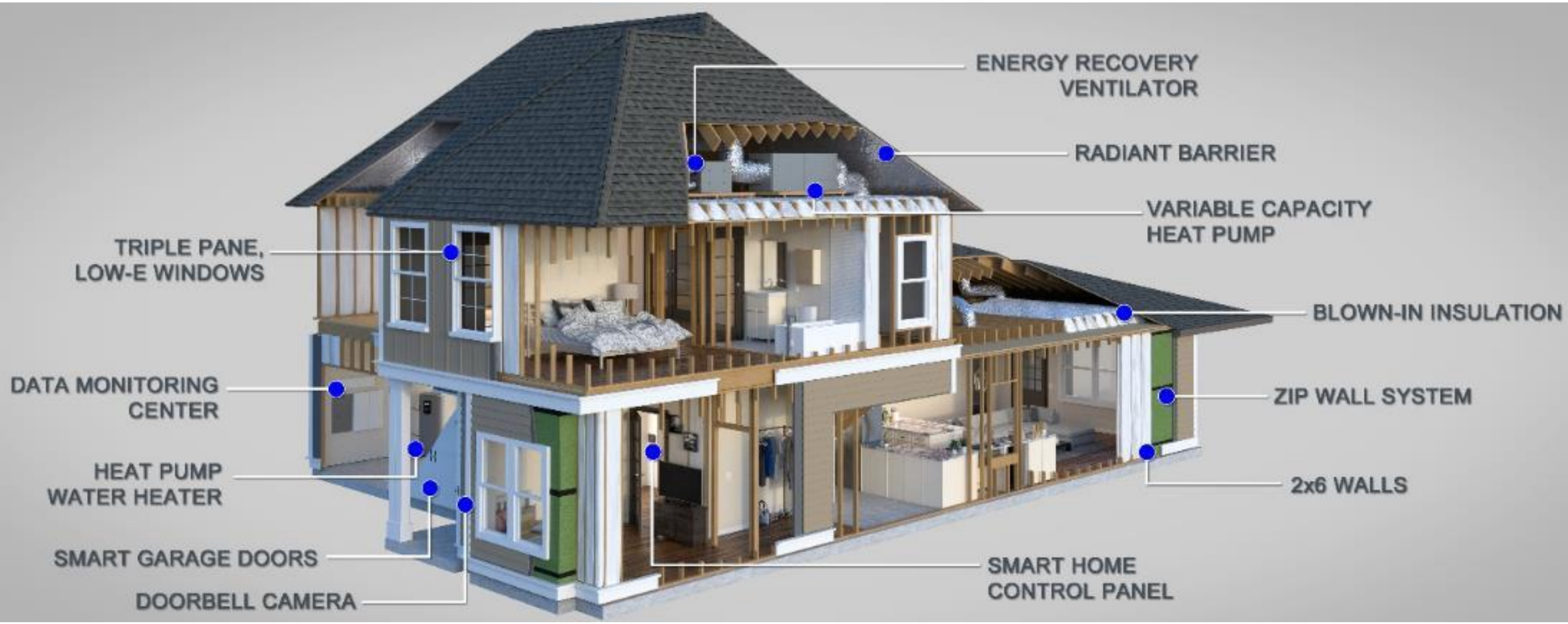
vivint. SmartHome

SAMSUNG

Alabama Power

SMART NEIGHBORHOOD™

Comfortable
Convenient
Connected


ENERGY RECOVERY VENTILATOR
RADIANT BARRIER
VARIABLE CAPACITY HEAT PUMP
TRIPLE PANE, LOW-E WINDOWS
BLOWN-IN INSULATION
DATA MONITORING CENTER
ZIP WALL SYSTEM
HEAT PUMP WATER HEATER
2x6 WALLS
SMART GARAGE DOORS
SMART HOME CONTROL PANEL
DOORBELL CAMERA

COMFORTABLE

WATER HEATING

The most efficient way to heat water.

Rheem Professional *Prestige*® Series Hybrid Electric Water Heater

- 50, 65, 80 gallon capacities
- LCD display with built in water sensor alert with **audible alarm**
- EcoNet WiFi- connected technology and mobile app **gives users control** over water system
- Customizable temperature control with **energy savings mode** and **vacation mode**

Photo courtesy of Rheem MFG

RESEARCH COMPONENTS

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1	2	3	4
High Performance Homes	Distributed Energy Resources	Building to Grid Integration	Connected Home Devices

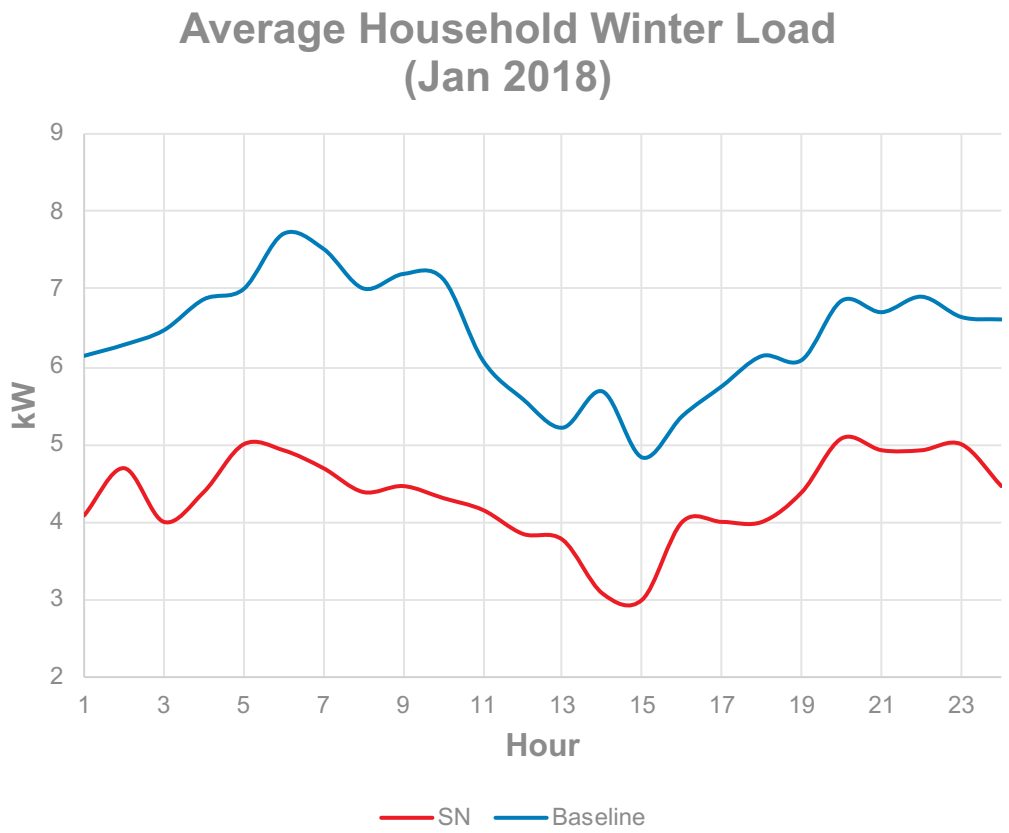
DATA COLLECTION

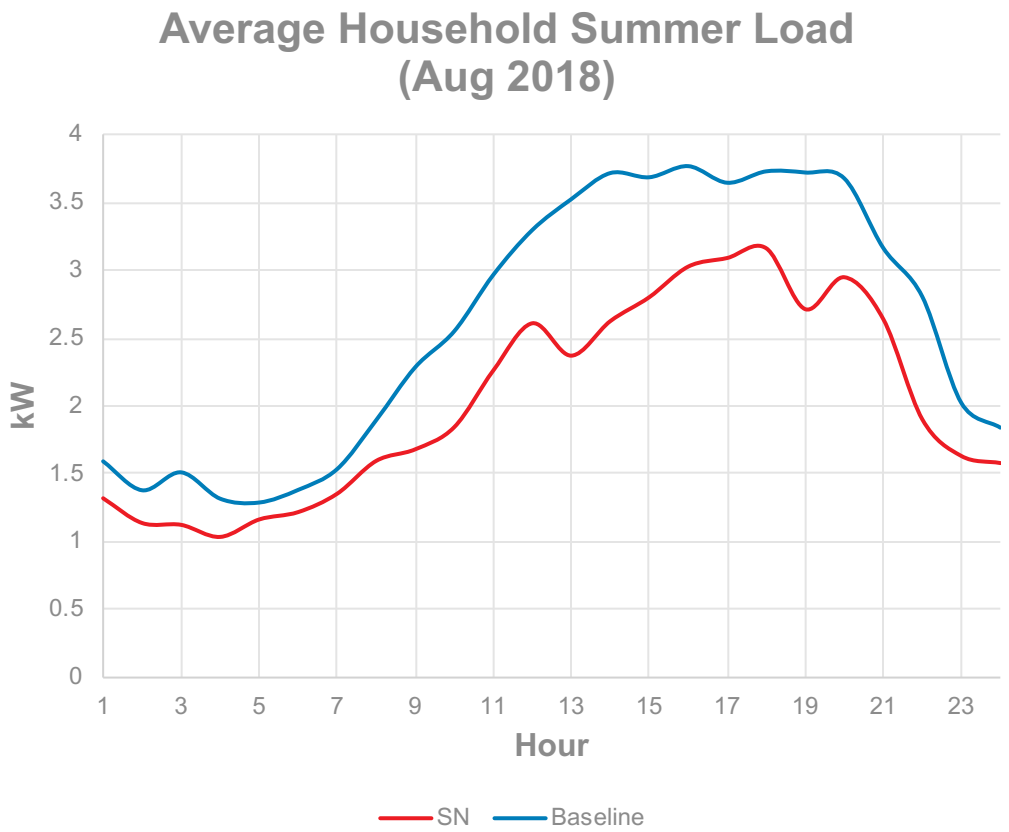
Home Data Monitoring

ENERGY EFFICIENCY

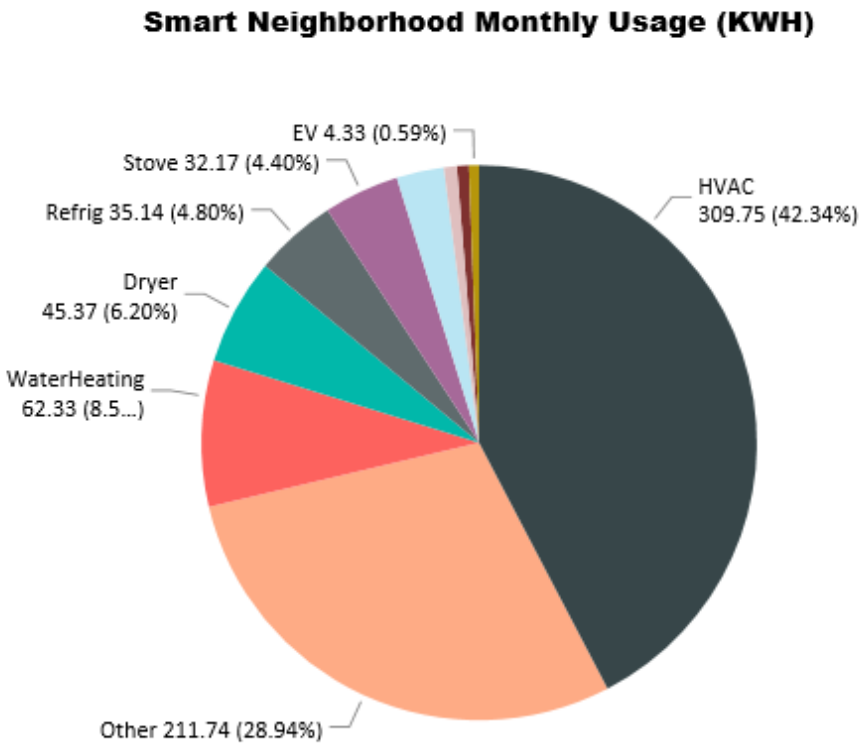
Summary Information

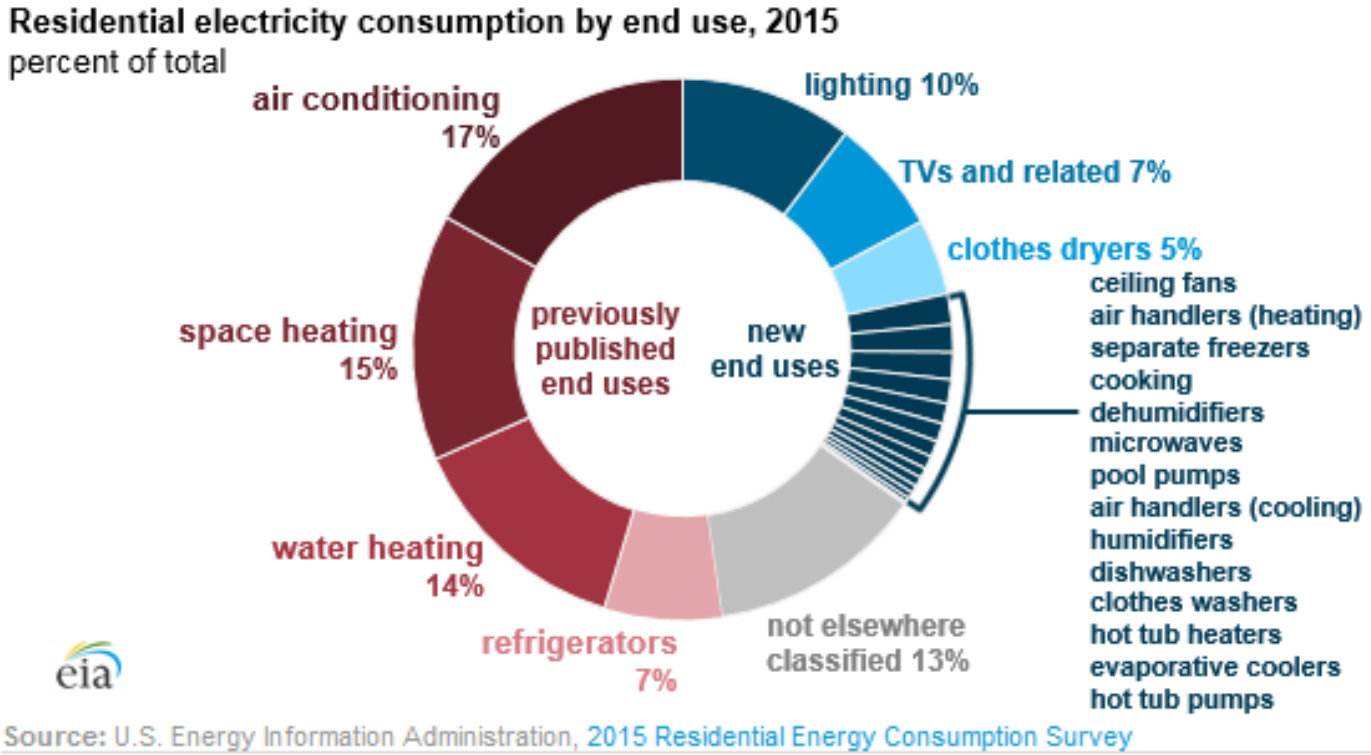
	Savings (kWh)	Peak (kW)	Summer Peak Reduction	Peak (kW)	Winter Peak Reduction
Smart Neighborhood	44%	3.16	16.1%	5.08	34.2%
Baseline Neighborhood	--	3.77		7.71	





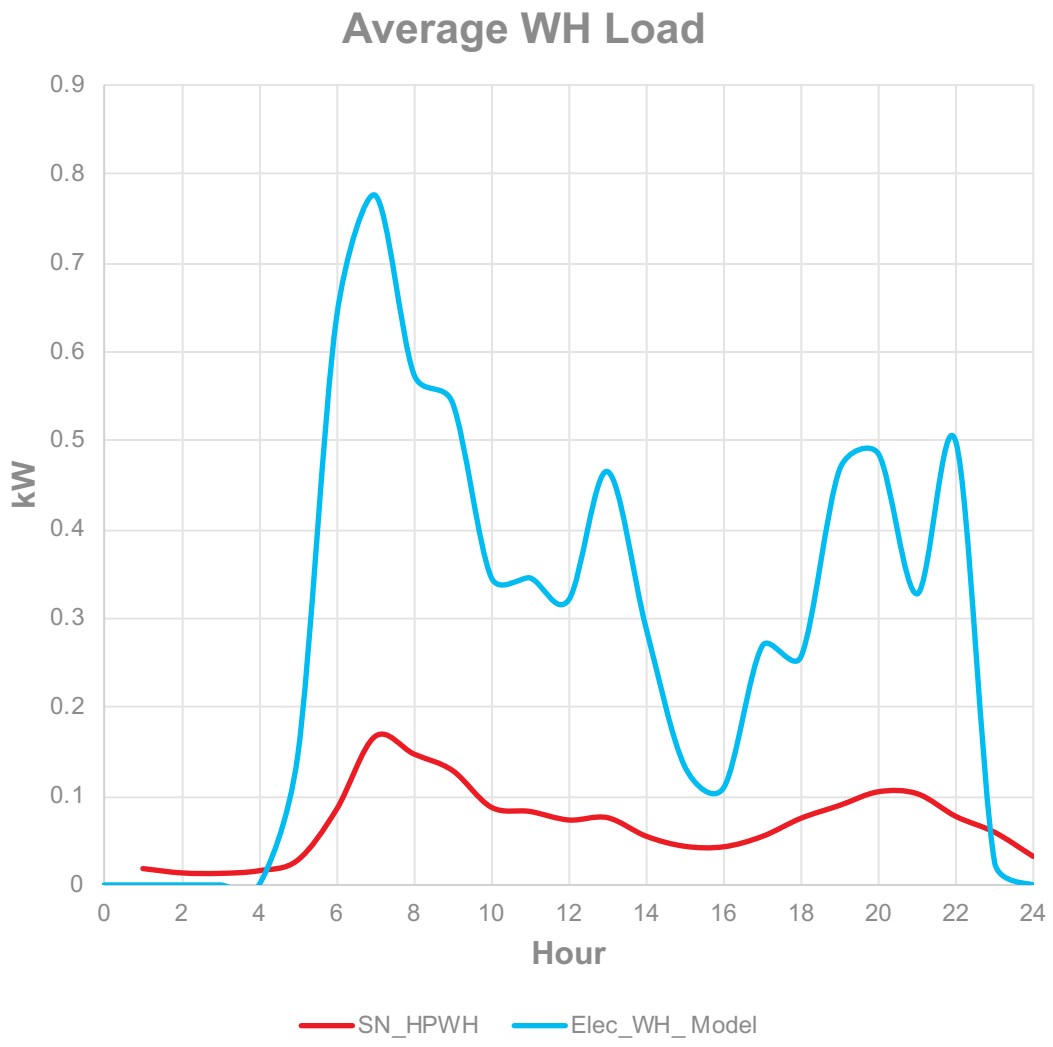
CONSUMPTION BY END-USE

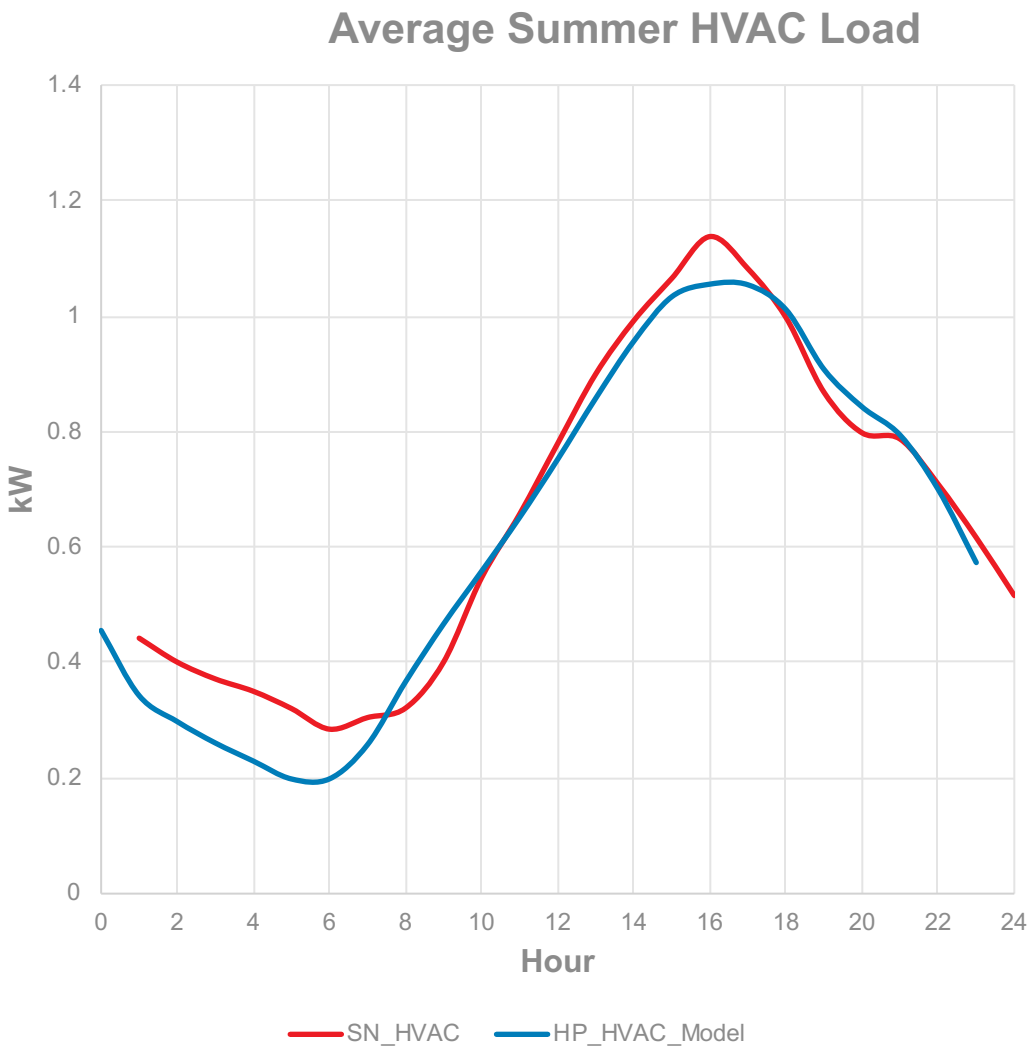




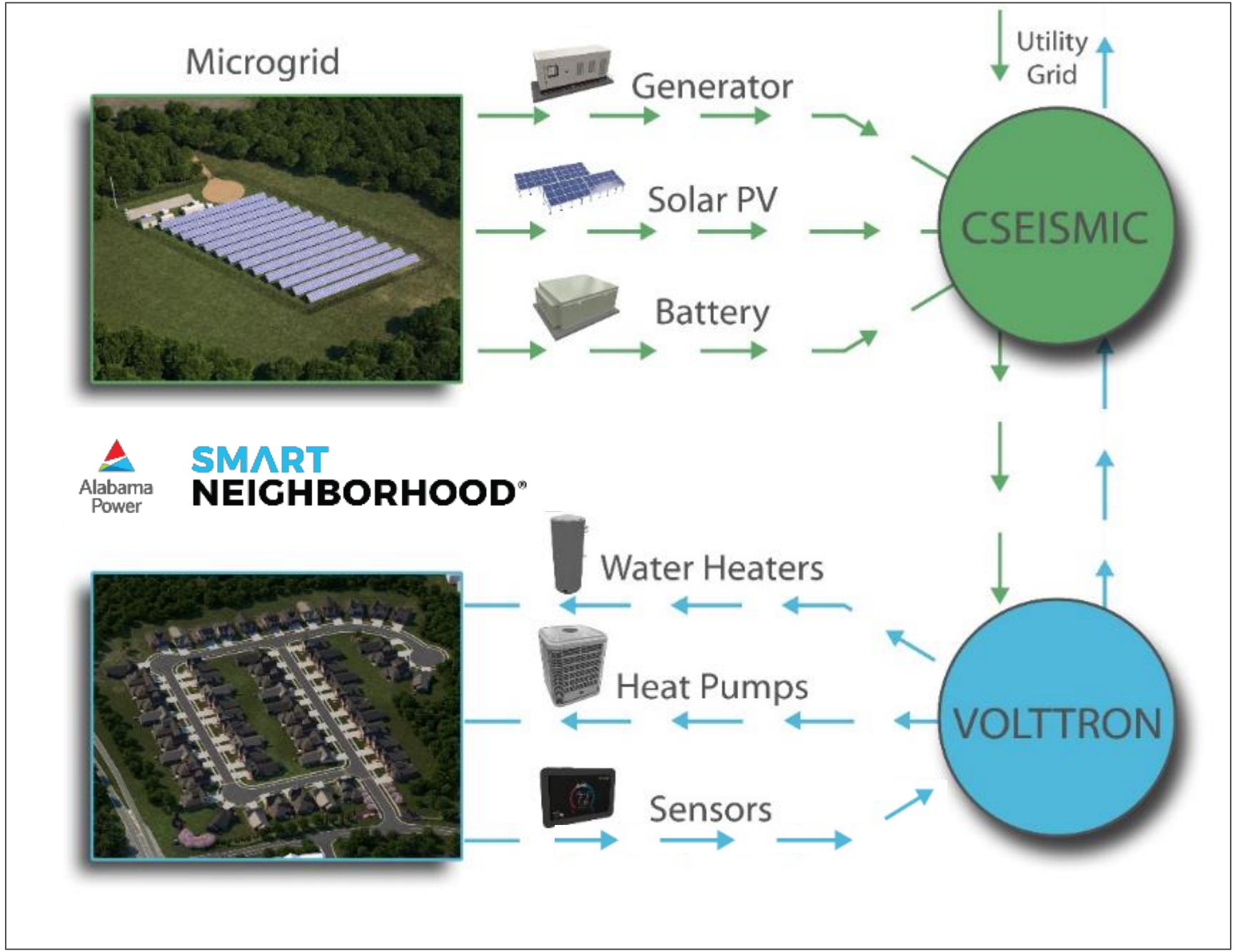
Source: U.S. Energy Information Administration, 2015 Residential Energy Consumption Survey

LOADSHAPE IMPACTS



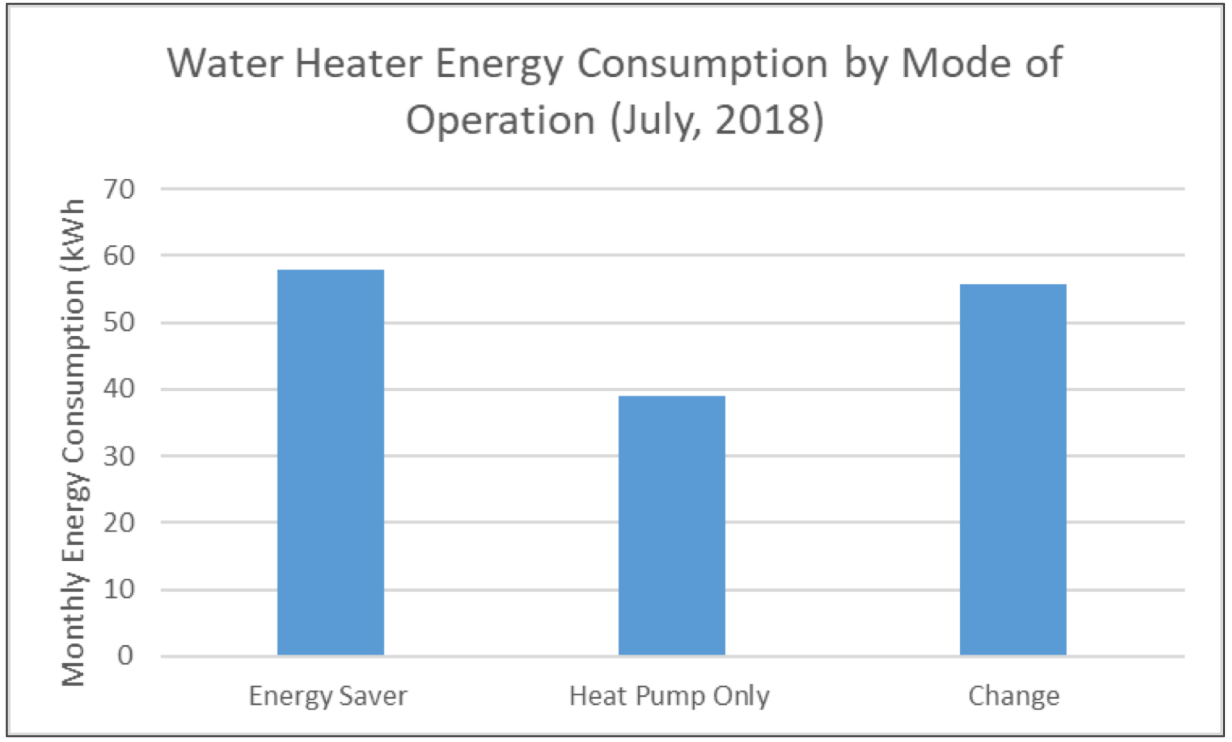


TRANSACTIVE CONTROLS



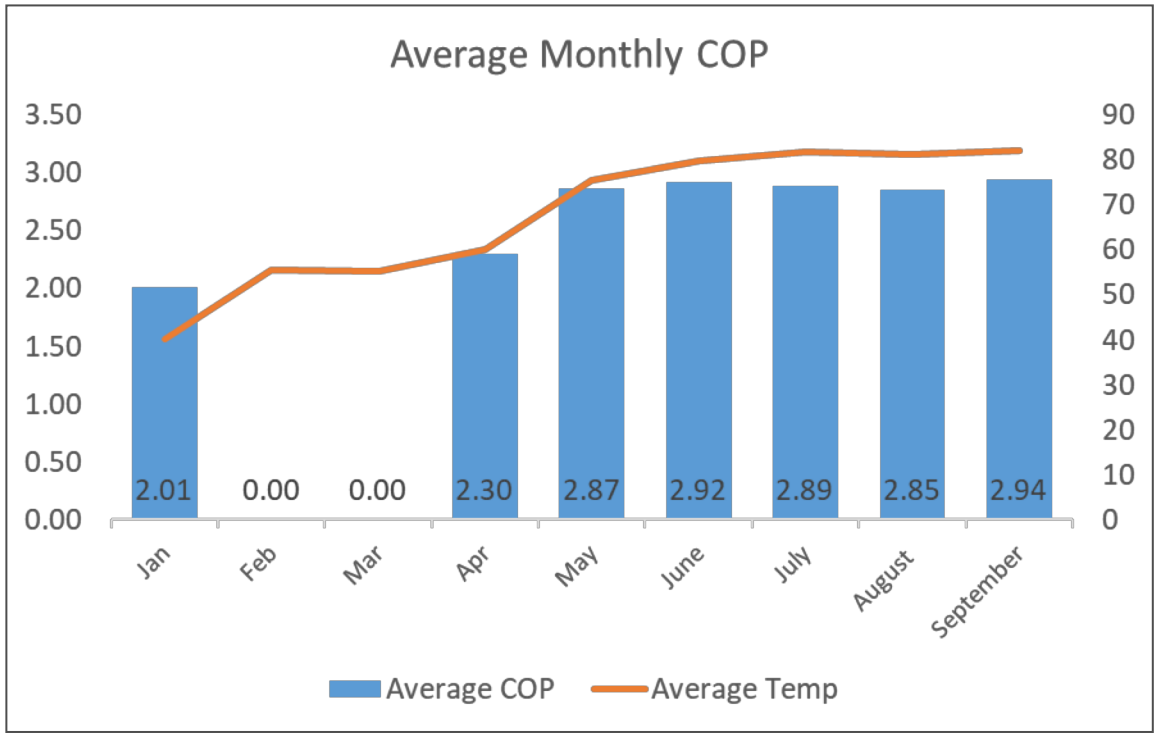
Water Heater Analysis Summary Statistics: July

- Number of reporting homes: 53
- Number of homes that have:
  - WH on Energy Saver Mode: 19 (~36%)
  - WH on Heat Pump Only Mode: 30 (~57%)
  - Changed mode during month of July: 4 (~7%)
- Water heater setpoint Avg. 130 Deg. F
  - Change his/her water heater setpoint during the month of July: (~9%)
  - No difference in avg. setpoints between modes
  - No correlation between WH setpoint and overall WH energy consumption.



Heat Pump Only Mode Performing better than Other Modes

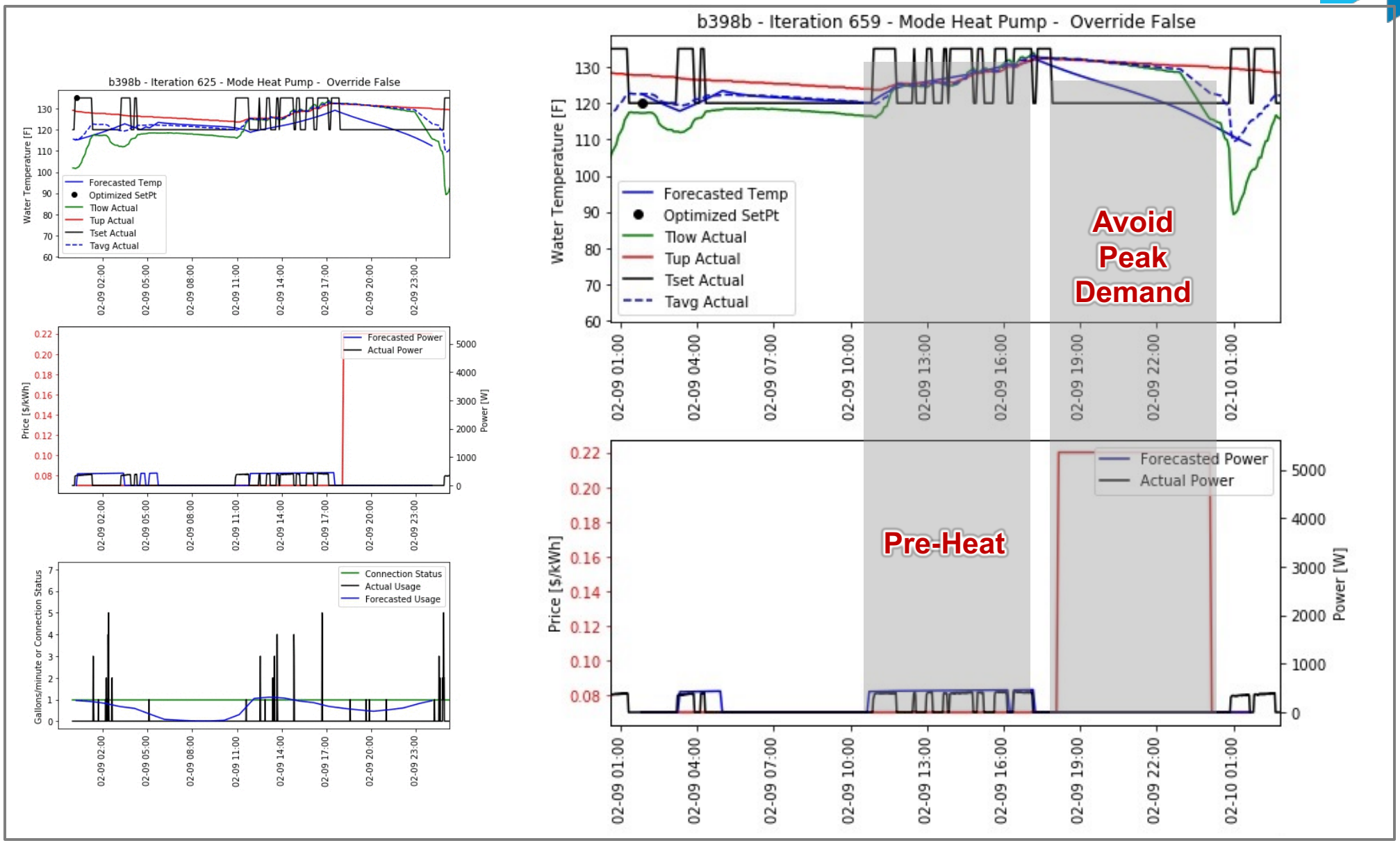
HPWH COP Calculation



Reynold's landing community average COP

- Community COP calculated for all homes with reliable data (<5% missing)
- Clear correlation of average temp to COP
  - Compared to lab tested COP of 3.5
- Less than 10 homes seeing monthly COP over 3.0
- Largest data constraint is the Rheem temperature data with ~15% of data "N/A"

WATER HEATER CONTROLS

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