HPWH Demand Response and Thermal Storage
The GE GeoSpring heat pump water heater is 71%* more efficient than standard electric water heaters

550W compressor
Back up 4,500/4,000W elements

~3,200 kWh savings/unit/year(*)

*Based on DOE test procedure and comparison of a 2015 standard electric tank water heater using 4647 kWh per year vs. the GeoSpring hybrid electric water heater using 1347 kWh per year.
WATER = CHEAPEST METHOD TO STORE ENERGY BEHIND THE METER

Renewables = intermittent energy sources

Static Storage Capacity (w/ 20F rise)
• 50 gal 2015 model: ~2.2 kWh
• 80 gal 2015 model: ~3.6 kWh

Static Storage Capacity (w/ 40F rise & Mixing Valve)
• 50 gal 2015 model: ~4.4 kWh
• 80 gal 2015 model: ~7.2 kWh
WI-FI CONNECTIVITY

Convenience

Peak shaving, peak shifting

ConnectPlus module
CTA 2045 CONNECTIVITY

Compatibility

Enables multiple standards

Radio
Cellular
Zigbee
WiFi
...other

Peak shaving, peak shifting

CTA 2045 Adapter
DC Form

GEA cloud

Utility Cloud
ESTABLISH TEST PLAN

Maximize DR benefits while keeping consumers happy with hot water

Success defined by being “invisible” to consumer
CASE STUDY

Glasgow KY EPB. 330 homes
- Externally controllable "smart" thermostat
- GE GeoSpring Heat Pump Water Heaters
- Sunverge Energy's Solar Integration Systems (SIS)

Efficiency benefits:
- Newer homes: 1,754 kWh/year
- Older homes: 1,898 kWh/year

Peak load reduction:
<< On average, Glasgow deals with 60 DR event days each year, with peak loads lasting some three hours each of those days. Energy-efficient homes saw an average load shed of 2.25 kW. Older homes had a much smaller shed of about 0.81 kW, but for the year that adds up to 26.24 MWh avoided for just 180 homes. (*)>>