

HPWH Demand Response and Thermal Storage



GE APPLIANCES


HPWH = LOAD REDUCTION

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.



HOME EFFICIENCY UPGRADE
Investing in a GeoSpring™ Free Hybrid electric water heater instantly makes the energy efficiency, value and appeal of your home.

WATER HEATER
2ND HIGHEST ENERGY USER in U.S. households*

46%	HEATING & COOLING
14%	WATER HEATER
13%	APPLIANCES
12%	LIGHTING
11%	OTHER
4%	ELECTRONICS

HEAT PUMP TECHNOLOGY
MORE EFFICIENT
71% COMPARED TO A STANDARD ELECTRIC WATER HEATER**

ABUNDANT HOT WATER
Same as standard electric water heater

50-GAL 1ST HR. DELIVERY	69 GALLONS
80-GAL 1ST HR. DELIVERY	94 GALLONS

ENERGY FACTOR (EF) = 3.39 **ENERGY FACTOR (EF) = 3.26**

EXCEEDS 2016 ENERGY STANDARDS™

55+ GALLON STANDARD ELECTRIC PHASED OUT

LOWERS HERS® INDEX 4 - 7 POINTS

EASY TO INSTALL
Tip: electrical and water connections same as standard electric water heater

\$\$\$ REBATES FOR BUILDERS
Visit geospring.com/pro

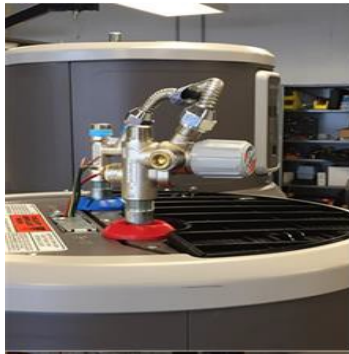
Made in AMERICA

© 2015 GE. All rights reserved. *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. **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. ***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. ****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. *****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

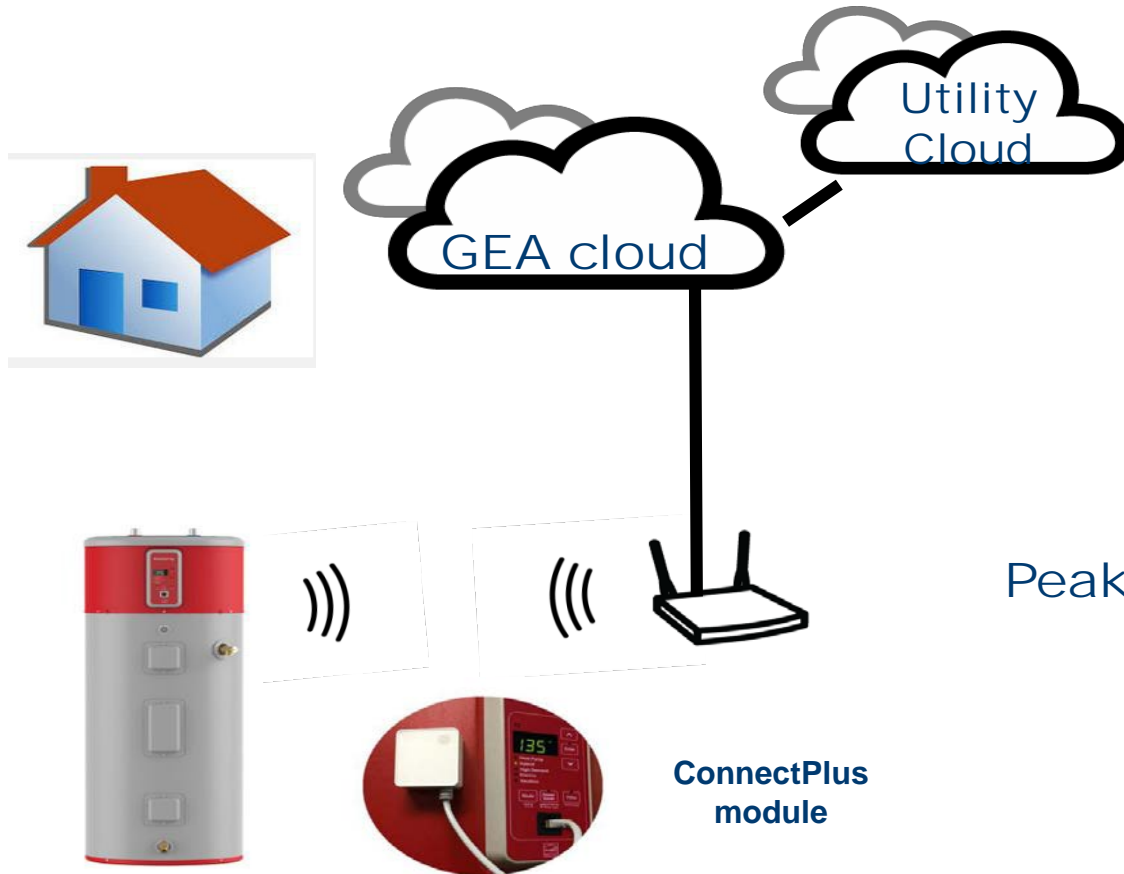
Static Storage Capacity (w/ 40F rise & Mixing Valve)

- 50 gal 2015 model: ~4.4 kWh
- 80 gal 2015 model: ~7.2 kWh



GE APPLIANCES

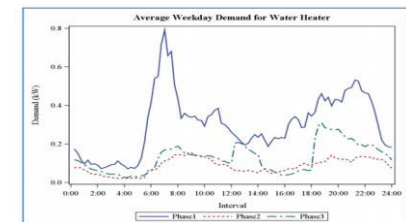
WI-FI CONNECTIVITY



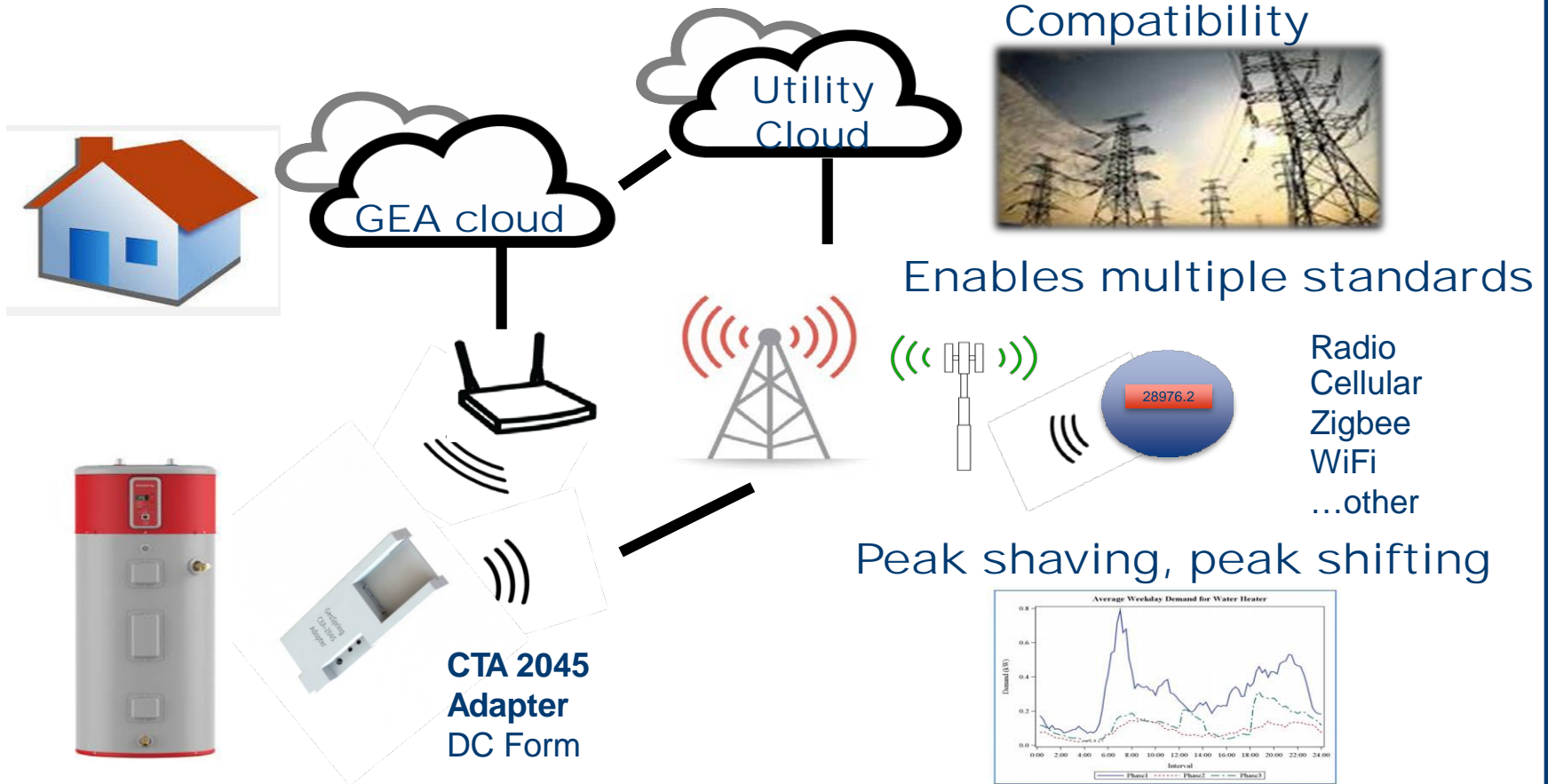
Convenience



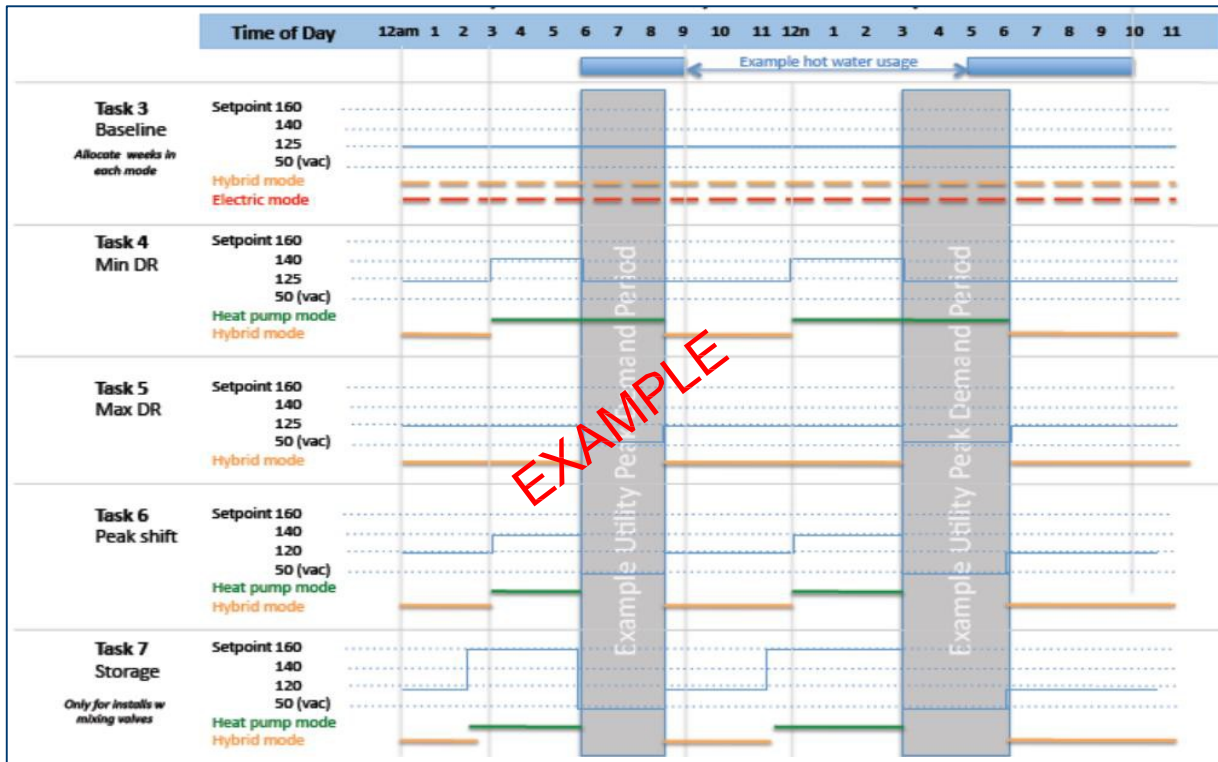
Peak shaving, peak shifting



CTA 2045 CONNECTIVITY



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.(*)>>

(*)http://www.ep.com/articles/powergrid_international/print/volume-20/issue-11/features/case-study-glasgow-epb-s-infocity-key-tour.html