

# Public Power and Hot Water

ACEEE Hot Water Forum  
February 22 – 24, 2015  
Nashville, TN

# American Public Power Association—Who Are We?

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- APPA is the national trade association representing interests of electric utilities that are units of state/local government

# American Public Power Association—Who Are We?

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- Approximately 2000 utilities serving more than 14% of electricity customers in the U.S
- Public power utilities can also operate natural gas utilities (most urban areas have natural gas service available --approx. 66 million residences out of approx. 117 million households)

# APPA's Advocacy Mission

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- APPA's advocacy mission is to give our members the ability and the tools to do their job—providing reliable, affordable electric service while practicing good environmental stewardship

# Examples

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- Water heater load control programs have been in place for decades
- They are a cost-effective means for demand response and system management (volts, VARs, frequency)
- There is significant potential in grid-interactive electric water heating

# Examples of Water Heater Programs

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- Fort Collins, CO
- Rockwood, TN
- Crawfordsville Electric Light & Power, IN
- Alexandria Light & Power, MN

# The Relevance of Policy in Consumer Energy Decisions

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- Water heaters can play a valuable part in power system regulation
- The HPWH generally results in a permanent savings
- The “power absorbing” and load reducing response of the HPWH differs from the RWH and can be more difficult to capture

# Impact of New Regulations on Consumer Behavior

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- Consumers tend to switch means when provided relatively equivalent alternatives
- “Substitute goods”
- Price differences provide a first & operating cost incentive to fuel switch reducing efficiency/ environmental savings from HPWH



# 80 Gallon Water Heaters

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Gas - \$590



[Rheem Gas Water Heaters Performance Plus 80 gal. Tall 9 Year 5500...](#)

**\$590.55** from Home Depot ★★★★★ 5,048 seller reviews

Electric tall water heater provides an ample supply of hot water for households with 5 or more people.

Electric- \$555



[Kenmore 80 gal. Tall 12-Year Electric Water Heater](#)

**\$555.99** from Sears ★★★★★ 5,802 seller reviews

Three inches of foam insulation and a long-life baked enamel exterior finish

Hybrid - \$1979



[Kenmore Elite 80 gal. Hybrid Electric Water Heater](#)

**\$1,979.99** from Sears ★★★★★ 5,802 seller reviews

Kenmore — trusted in the homes of more than 100 million Americans.

# Water Heaters

## 50 gallon yearly operations cost estimates

Gas - \$282

	Performance	Performance Plus	Performance Platinum	Performance Platinum 6-Star
Tank and Parts Warranty	6 Years	9 Years	12 Years	12 Years
In-Home Labor Warranty	1 Year	2 Years	3 Years	3 Years
Diagnostic Functions	7	7	7	16
Self-Cleaning	No	Yes	Yes	Yes
Drain Valve	Plastic	Plastic	Brass	Brass
Energy Star Qualified	No	No	No	Yes
40 Gallon Gas Tall Available First Hour of Water (Gallons)	67	71	73	73
40 Gallon Gas Tall Estimate Yearly Operating Cost	\$277	\$283	\$283	\$283
40 Gallon Gas Short Available First Hour of Water (Gallons)	67	71	72	72
40 Gallon Gas Short Estimate Yearly Operating Cost	\$277	\$283	\$283	\$284
50 Gallon Gas Tall Available First Hour of Water (Gallons)	82	84	86	86
50 Gallon Gas Tall Estimate Yearly Operating Cost	\$282	\$283	\$283	\$284

Shop Rheem Residential Gas >

### ELECTRIC WATER HEATER COMPARISON CHART

	Performance	Performance Plus	Performance Platinum 6-Star
Tank and Parts Warranty	6 Years	9 Years	12 Years
In-Home Labor Warranty	1 Year	2 Years	3 Years
Thermostat Display	None	LED	Advanced Electronic
Self-Cleaning	No	Yes	Yes
Drain Valve	Plastic	Plastic	Brass
40 Gallon Electric Medium Available First Hour of Water (Gallons)	53	56	56
40 Gallon Electric Medium Estimate Yearly Operating Cost	\$579	\$553	\$553
50 Gallon Electric Medium Available First Hour of Water (Gallons)	62	62	62
50 Gallon Electric Medium Estimate Yearly Operating Cost	\$585	\$567	\$567
50 Gallon Electric Tall Available First Hour of Water (Gallons)	67	67	67
50 Gallon Electric Tall Estimate Yearly Operating Cost	\$579	\$553	\$553

Shop Rheem Residential Electric >

Electric- \$579

Hybrid - \$240-ish

<http://www.geappliances.com/heat-pump-hot-water-heater/>

# Value of System Optimization

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- Difficult to measure, but important consideration in aligning consumer incentives with utility incentives
- Fuel switching may make achieving policy goals more difficult
- Average value of \$768 per hour for water heater program operation for an average utility survey participant

# APPA Survey Results

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- 90 Utilities
- 44.5% of utility respondents have energy efficiency, demand response or other programs that pertain to electric resistance water heaters.
- 34% of respondents without programs are considering a water heater load control program of some sort;

# APPA Survey Results

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- Average peak demand = 201.5 MW
- Summer = 11.2 MW, or 4.9 % average reductions
- Winter = 10 MW, or 4.4 % average
- Estimated that 51.3 % of their residential customers have electric water heaters

# APPA Survey Results

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- 42 % Peak load reduction
- 26 % Energy shifting
- 15% Distribution reliability
- 5% Regulation service for the grid operator
- 5% Load balancing for the grid operator
- 5 % Use as storage for renewable energy

# Questions & Comments

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