

The Future of Electric Water Heating

Or.....

**More than you ever wanted to know about
electric water heating!**

Steven Koep, Utility Sales Manager
Vaughn Thermal Corporation
Salisbury, MA

The Future of Electric Water Heating

- **Electric HPWH Technology & Trends**
- **Grid-Interactive Electric Water Heating**
- **Demand Response and/or Load Building?**
- **Program Options & Financing Opportunities**

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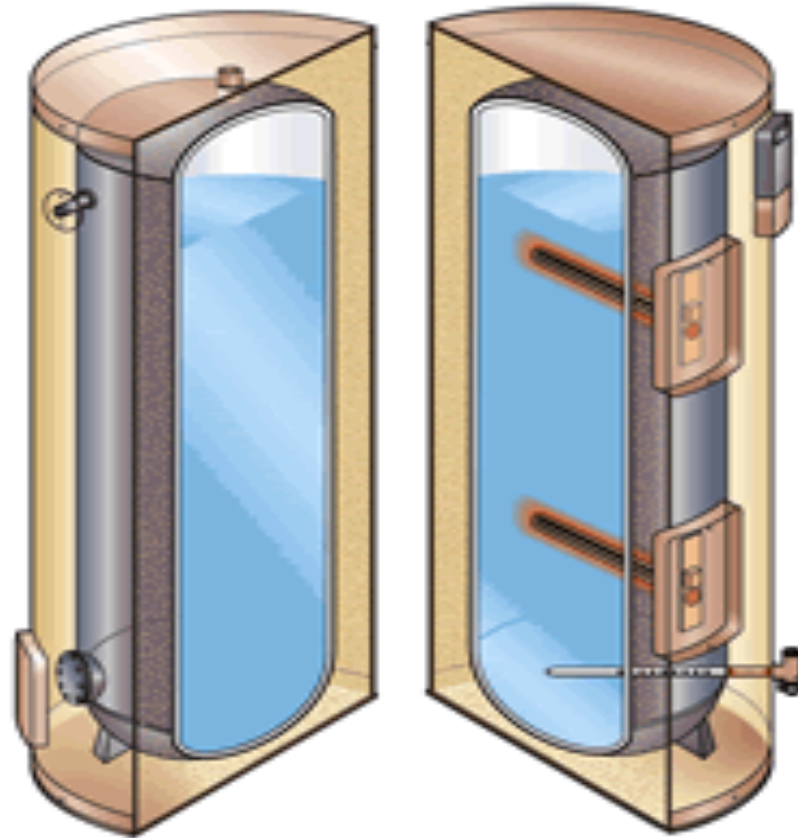
Introduction – How did we get here?

- Energy Star for Water Heaters
- Integrated HPWH Tech Enters the Market
- DOE Rulemaking – April 2010
- Grid-Interactive Electric Water Heating
- Rising Profile of Renewable Energy Storage
- Convergence of Circumstance & Opportunity

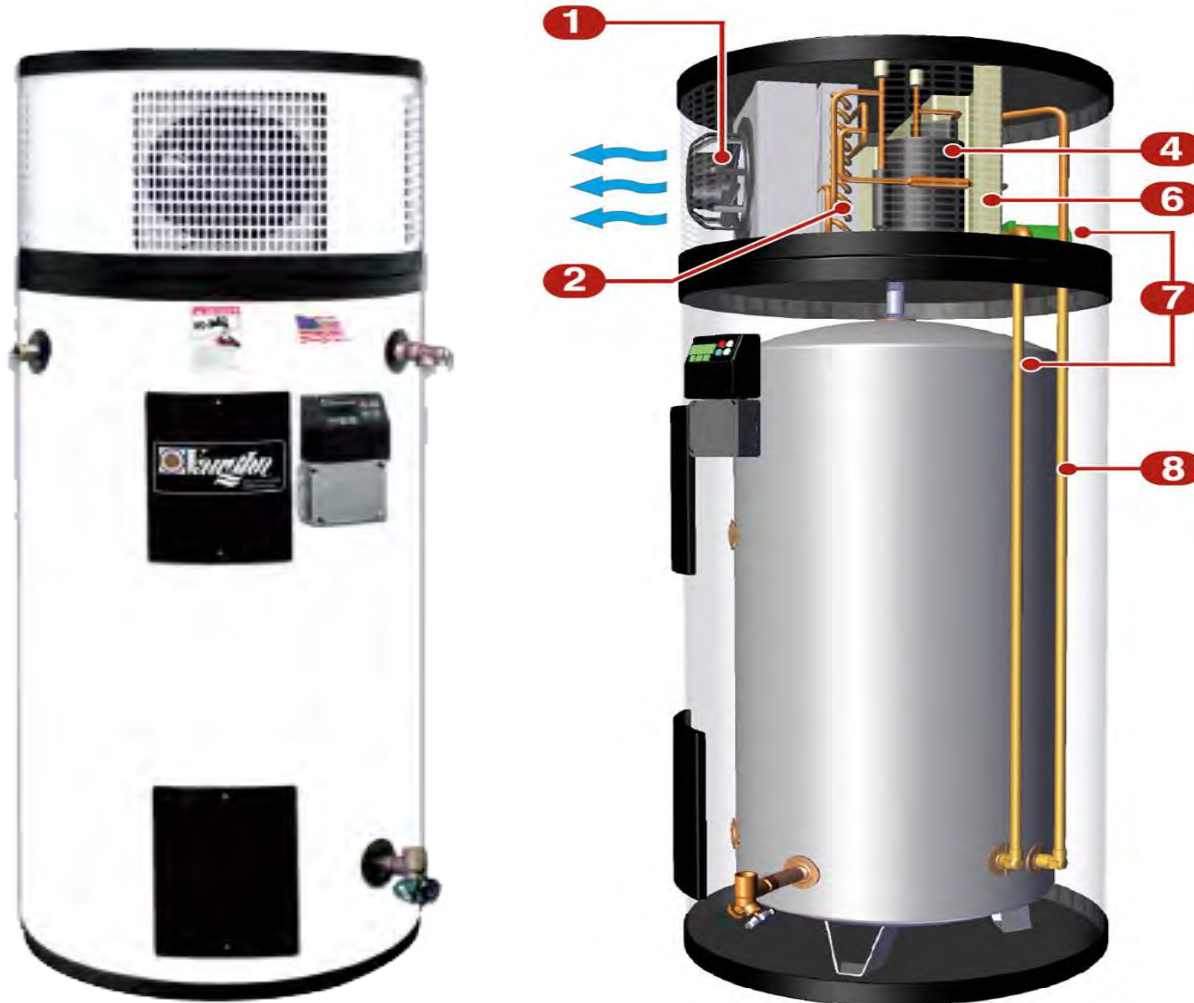
Defining The Opportunity

- Pursue effective carbon reduction by changing the technology and/or changing the source energy
- 50M+ Residential Electric Water Heaters, Most will not convert to HPWH or Solar
- 2-Way Communication as the key to Grid Connectivity and Ancillary Services

Conventional Electric Resistance Water Heater



Electric Integrated HPWH



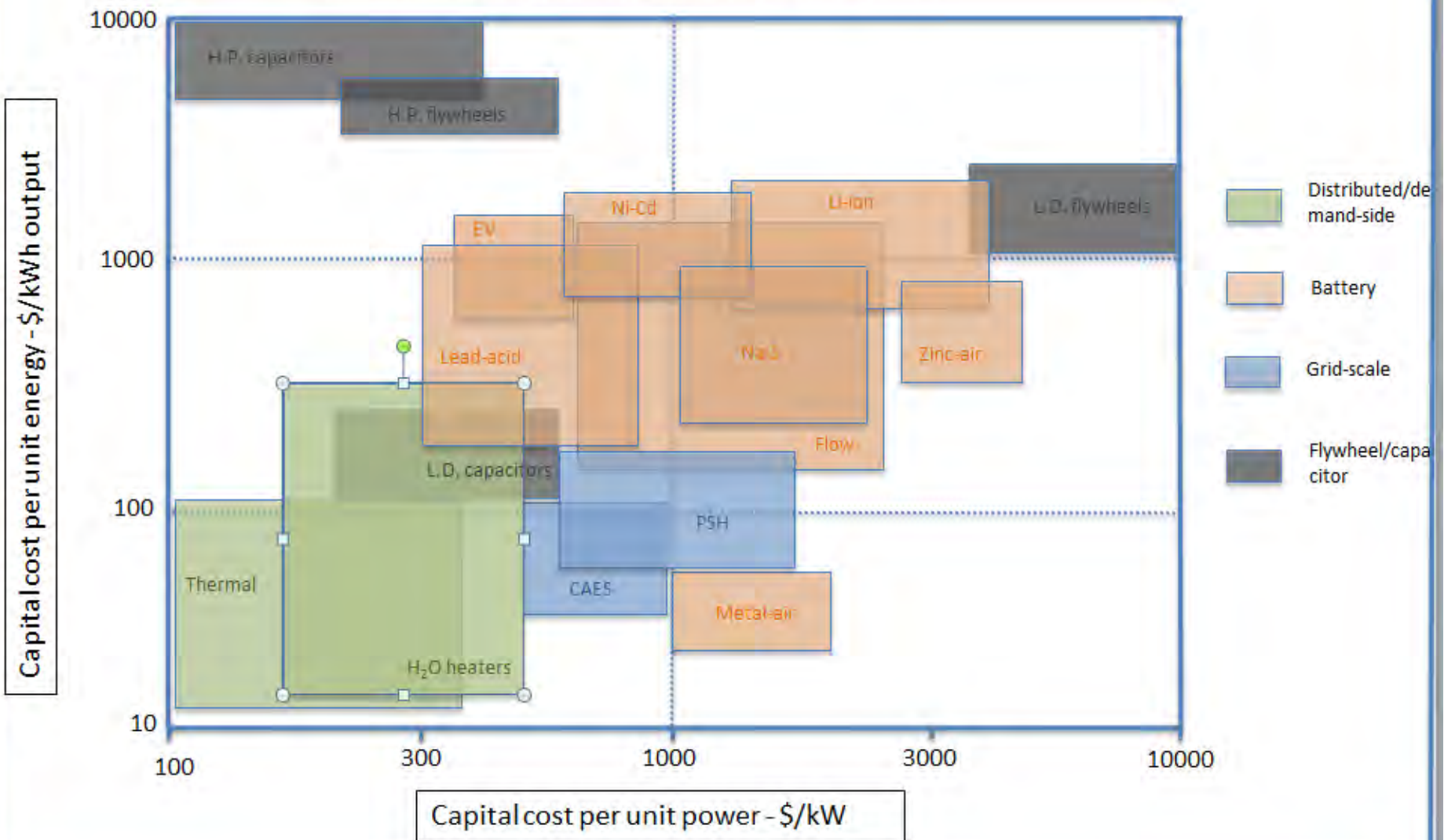
Electric Add-On HPWH



GIWH – Grid Interactive Water Heating



Cost per Unit of Performance for Various System Flexibility Options



Defining The Opportunity

- Pursue effective carbon reduction by changing the technology and/or changing the source energy
- 50M+ Residential Electric Water Heaters – Most will not convert to HPWH or Solar
- 2-Way Communication as the key to Grid Connectivity and Ancillary Services
- Follow Dr. Steve's 'Renewable' Logic....

Dr. Steve's 'Renewable' Logic

- RE is a good thing – Make all we can!
- Utilizing RE is a good thing – Use all we can!
- Unused RE - spilled hydro, curtailed wind - is definitely not a good thing!
- So, utilizing available/excess/low-cost/no-cost RE is a very good thing!

Defining The Road Ahead

- Support proliferation of HPWH technology, both integrated and add-on, where they make the most sense.
- Recognize and support the introduction of grid-interactive, ETS water heating systems as a viable carbon reduction strategy.
- Explore alternative market delivery models to reduce first-cost hurdle – lease/rental options, 3rd party financing, etc.

Market Development Opportunities

- Maintain/Build Water Heater Market Share
- Water Heater Merchandising Programs
- Better Rebates for Better Products!
- Rental/Lease Program Options
- Turnkey Program Options
- Grid-Interactive, Renewable Storage Options

Defining Success

- HPWH Achieving 5% Market Share
- Recognition of Add-On HPWH Market Potential
- New Equipment Classification for GIWH
- MW-scale GIWH Demonstration Projects
- Hot Water As A Utility Service Offering
- Realizing the customer, utility, environmental and societal value of Electric Water Heating!

Thank You!

Steven Koep, Utility Sales Manager

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