

**What Happens When.....**

# **The 'Forgotten Appliance' Meets the Internet of Things!**

- **GIWH : Grid-Interactive Water Heating**
- **Demand Response and Strategic Energy Sales**
- **Program Options & Financial Opportunities**
- **No 'Uncontrolled' Electric Water Heaters!**

# Introduction – How did we get here?

- Energy Star
- Integrated HPWHs
- DOE Rulemaking, April 2010
- **Grid-Interactive Electric Water Heating – GIWH!**
- Rising Profile of Renewable Energy Storage
- March 19, 2015 – Testify to House SubCmte
- April 16, 2015 – DOE Final Rule in Effect
- April 21, 2015 – Congress Passes Bill
- April 30, 2015 – President Signs Bill establishing  
‘Grid-Enabled’ ETS Water Heater Category!

# Product Definition: Grid-Enabled ETS Water Heater

- Product Category Established by Legislation
- 75+ Gallons
- Activation Lock Functionality
- Mandated Efficiency,  
 $EF = 1.061 - (\text{Vol.} \times 0.00168)$

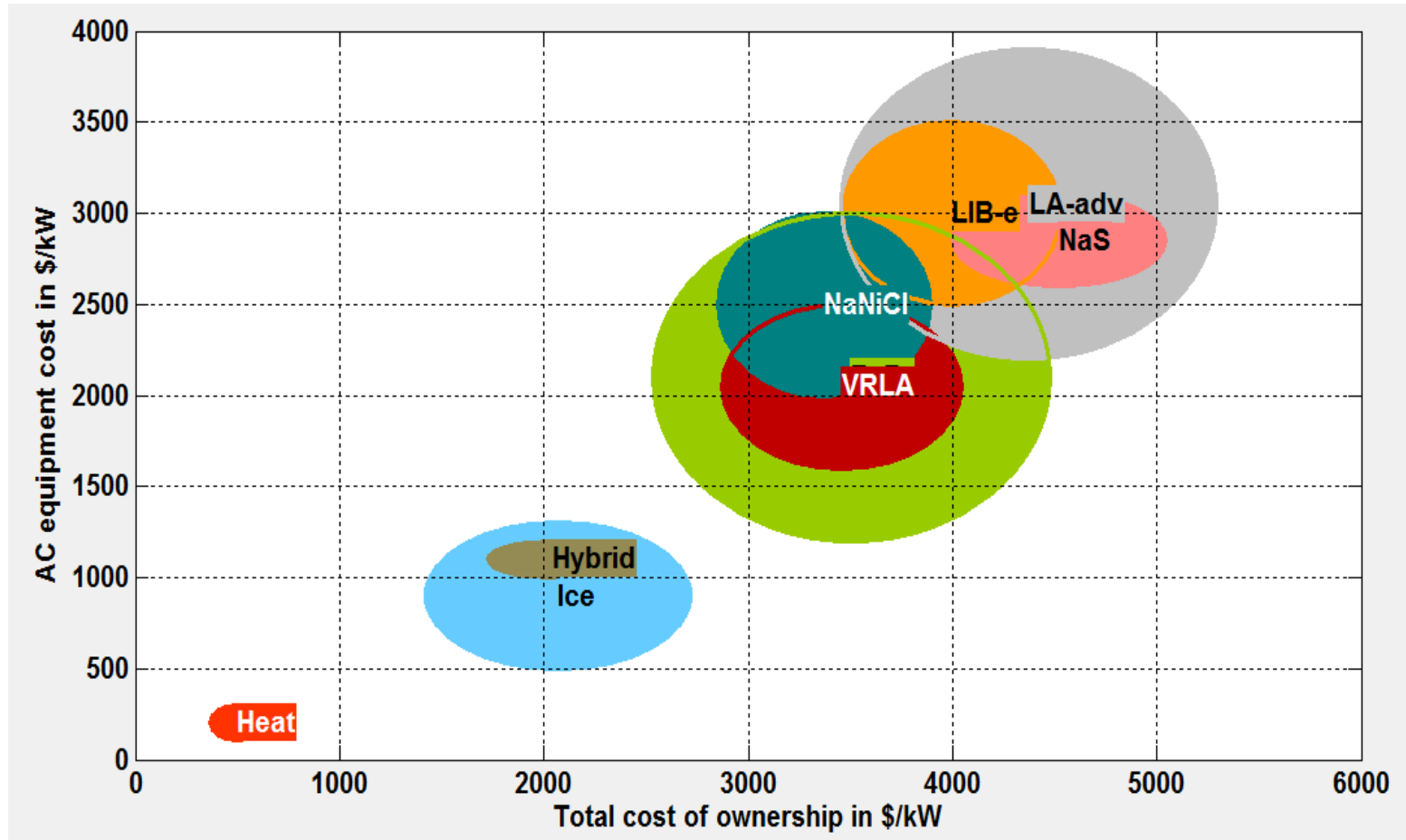
Introducing.....

## The **V-Grid** Grid-Enabled **ETS** Water Heater!

- 80-100-119 Gallon Capacities
- 1/2" Stone Lining for Added Electric Thermal Storage
- 3" Foam for Efficiency
- Grid-Enabled with Electronic T-Stat
- Activation Lock Functionality
- 160F Max Temp Setting



# Sandia – Energy Storage Costs



# **Embrace The GIWH Opportunity or... What is GIWH & Why Should I Care?**

- Change the technology and/or  
Change the source energy!
- 50M+ Residential Electric Water Heaters –  
Most will not convert to HPWH or Solar!
- 2-Way Communication is the Key.....  
To Grid Connectivity and Ancillary Services
- Launch PLMA GIWH Interest Group
- Follow The 'Renewable' Logic....

# GIWH - 'Grid-Interactive' Water Heater



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Your electric storage water heater is a thermal battery that can help integrate renewable energy into the grid.



America's Electric Cooperatives

# Dr. Steve's 'Renewable' Logic

- **Renewable energy is a good thing!**  
We should make all that we can!
- **Using renewable energy is a good thing!**  
We should efficiently use all that we can!
- **Unused renewable energy is NOT a good thing!** We should store and utilize all of the available low-cost and no-cost renewable energy that we can!



# Understand where we're headed...

- Support and utilize GIWH as a viable carbon reduction strategy
- Consider other market delivery models to reduce the first-cost hurdle
  - Water Heater Leasing options
  - Hot Water as a service
- Encourage HPWH technology - where it makes the most sense

# Retain/Grow Market Share

- Develop new water heater program options!
- Better rebates for better products!
- Introduce a water heater leasing program!
- Look to the future with grid-interactive, renewable storage features!
- Think “**Community Storage**”!!!

# Defining Success

- New product classification for Large-Capacity Grid-Enabled ETS Water Heaters
- MW-scale GIWH implementation projects
- Hot Water as a Service
- HPWH achieving 5% market share by 2025?
- GIWH as the foundation of 'Community Storage'

# **PLMA BTMS Interest Group (BTMS > Behind-The-Meter Storage)**

- PLMA – Peak Load Management Alliance
  - [www.peakload.org](http://www.peakload.org)
  - Mission Statement
  - Collaborative Market Development
- Opportunity for Co-op Leadership
- Realize the member, cooperative, and community value of GIWH
- **The Community Storage Initiative!**

# Thank You!

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