Testimony of Steven Koep
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Before the House Committee on Energy & Commerce
Subcommittee on Energy & Power

To review legislation to protect grid-enabled water heaters

March 19, 2015

Chairman Whitfield, Ranking Member Rush, members of the Subcommittee, thank you for inviting me to testify today on legislation to protect grid-enabled water heaters.

My name is Steven Koep, and I am the National Utility Sales Manager at Vaughn Thermal Corporation. Vaughn Thermal Corporation, located in Salisbury, MA, manufactures a wide range of water heating and electronic control technologies.

I would like to thank the subcommittee for addressing this important issue and for inviting me here to testify.

Introduction – Vaughn Thermal Corporation ("Vaughn") has been in the business of manufacturing high-efficiency, long-life electric water heaters for electric utility ETS (Electric Thermal Storage), load management, DSM (Demand-Side Management), DR (Demand Response) and lease/rental programs for over 50 years. Vaughn builds electric resistance water heaters and controls for residential and commercial applications, as well as indirect-fired water heaters for solar, geothermal and boiler applications. In addition, Vaughn has launched a line of integrated HPWHs (Heat Pump Water Heaters). Vaughn is an active member of AHRI, AESP (Association of Energy Service Professionals) and the Peak Load Management Alliance (PLMA). Vaughn is also an Associate Member of the National Rural Electric Cooperative Association (NRECA). In addition, Vaughn has filed an Application for Exception with OHA and is currently awaiting notification of the decision. We very much appreciate the opportunity to speak to the urgency of this legislative solution to an impending national problem.

Topics –

- **Grid-Enabled Product Classification –** Vaughn is in complete agreement with the electric utility industry regarding the economic, environmental and societal value of grid-enabled electric water heating (GEWH).

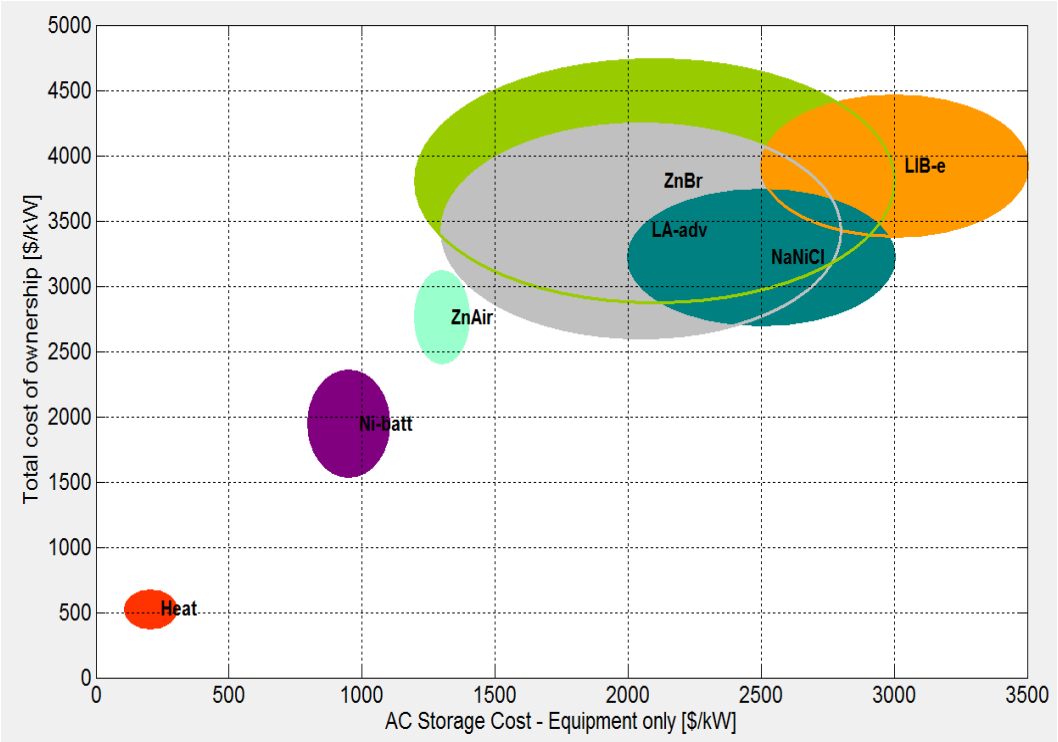
Unfortunately, DOE's water heater rule that goes into effect next month will effectively ban the manufacture of the large-capacity water heaters that can be enabled to respond to the real-time needs of utility grid-operators. In March 2013, DOE had initially proposed a waiver approach, which was commendable. However, DOE has not moved forward to expand upon the proposed rulemaking or introduce a formal waiver process. The legislation's provision for a new product classification for grid-enabled electric thermal storage water heaters, as proposed by the stakeholder group which included electric utilities, water heater manufacturers and environmental organizations, is clearly called for in this circumstance and would best serve the interests of water heater manufacturers, electric utilities and their mutual customers. As the April deadline approaches, this legislation is urgent as it will take time for Vaughn to prepare to meet the requirements specified in the legislation to provide utilities with a grid-enabled option once DOE's rule goes into effect.

- **How to reduce the energy intensity of residential electric water heating? Change the Technology and Change the Source Energy –** While HPWHs have the potential to reduce the carbon footprint of residential electric water heating by 50% through improved energy efficiency, the technology is not

universally-suited to all residential applications. In cold climates, HPWHs contribute to the heating load of the home for 6 or more months of the year, thereby reducing overall efficiency and carbon reduction potential. Lab testing and field demonstrations of grid-enabled electric water heating have shown similar or greater carbon reduction potential, particularly in northern climate applications. At this point in time, there exists the unique opportunity to set the stage for a doubling of carbon reduction potential in the electric water heating market by enabling the continued evolution and proliferation of grid-enabled electric water heating that can interact with the grid. The GEWH technology application has the demonstrated capability of delivering economic, environmental and operational benefits that extend well beyond the one-dimensional market driver of higher efficiency alone.

- **Renewable Storage Opportunity -** As increasing amounts of intermittent renewable energy generation have come on line (primarily wind and solar), the need for renewable storage becomes more and more prominent. By necessity, the electric utility industry is experimenting with MW-scale battery and flywheel technologies that promise performance and flexibility, while carrying the added burdens of cost and complexity. It can certainly be argued that the nation needs an 'all of the above' storage technology

development strategy, but the fact remains that electric thermal storage (ETS) is the 'low hanging fruit'. Operating as a "thermal battery", it is the only cost-effective, widely deployable distributed storage option currently available (see graphic below: ES-Select, developed for Sandia National Lab). In addition, providing excess, low-cost or no-cost renewable energy to a grid-enabled electric water heater as part of a GIWH control strategy can significantly reduce the carbon footprint of the appliance.



ES Select – Developed by KEMA (DNV-GL) for Sandia National Laboratory

Summary – Vaughn Thermal Corporation manufactures large-capacity ETS water heaters and electronic water heater controls in support of utility-sponsored load

management, Demand-Side Management, Demand Response and GEWH programs. Vaughn is in complete agreement with the electric utility industry regarding the significant economic, environmental and societal value of GEWH technology and programs. A new Grid-Enabled product classification would provide a much firmer foundation for the important contributions that this technology can make to the well-being of the country, particularly in terms of energy efficiency, carbon reduction, grid integrity, and renewable energy storage. We hope that Congress will move swiftly to pass this legislation so that manufacturers such as ourselves can have some degree of certainty that our products can get to market in order to demonstrate the advances being made in grid-enabled water heating technology. We welcome the opportunity to work with electric utilities across the country to realize the tremendous potential of grid-enabled electric water heating. Thank you for your time and consideration.