Testimony of

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Good morning, Mr. Chairman and distinguished members of the Subcommittee on Energy and Environment. It is a privilege to be invited here today and be given the opportunity to offer views and perspectives of the Electricity Storage Association (ESA) on the value of deploying energy storage in the electrical grid of the United States.

My name is Bradford Roberts, and I am the current Chairman of the Board of the Electricity Storage Association (ESA). The ESA is a trade organization founded 17 years ago to promote the value of electrical energy storage in our nation's grid and other electrical systems around the world. The ESA was founded from the Utility Battery Group (UBG), a utility group focusing on the benefits of using large-scale storage in their systems. ESA membership currently numbers approximately 100 member organizations encompassing most of the major utility companies in the US, leading manufacturers of energy storage systems around the world and leading technologists from academic and engineering firms with interest in designing storage applications.

Over the last 17 years the ESA has worked closely with the Department of Energy's Energy Storage Program, Sandia National Laboratories and various State agencies such as the California Energy Commission (CEC), the New York State Energy

Research and Development Authority (NYSERDA) and the Electric Power Research Institute (EPRI).

ESA members have contributed key advancements to electricity storage technologies using the very limited funds in the DOE Energy Storage program. These activities have helped build a strong foundation for meeting the needs for the growing electricity grid that must now capitalize on the use of renewable energy sources, become more reliable, take advantage of smart grid technology and be resilient to threats of any kind. Storage of electricity is able to address these needs by reducing the need for fossil fuels, reducing cost of electricity and at the same time increase the reliability and robustness of the electric power system.

Primary Benefits of Storage in the Grid

Studies and projects funded by the DOE Energy Storage Program have helped define the most significant uses of electric energy storage. The most compelling of these uses are:

- Control power cost volatility
- Make more efficient use of fossil fuels like natural gas and oil to reduce dependency on foreign sources
- Benefit the transmission and distribution systems
- Enhance the use of renewable energy sources
- Improve the overall performance of combined heat and power systems
- Improve the grid's stability, reliability and security

Very large-scale systems like pumped hydro plants have been successful in providing bulk storage for the overall grid's use but only in the last few years have

practical and affordable distributed storage systems begun to appear. Other smaller electricity storage technologies, many of them marketed and deployed by our members, offer more flexibility in deployment on a distributed basis throughout the grid. These technologies offer a variety of benefits to the key items mentioned above.

Storage systems can capture low-cost energy at night and discharge it during peak daytime periods to control price volatility. Some storage systems can peak shave at the substation level and defer system upgrades. These large systems and smaller fast-acting dynamic energy systems such as flywheels can provide vital ancillary services to the grid such as spinning reserve and frequency regulation. Wind energy generated at night can be transported on a lightly loaded transmission system to load centers and discharged at peak times. Excess electricity from combined heat and power (CHP) systems can be used to charge local storage systems and further improve total grid efficiency. Further, greater amounts of stored electrical energy in the grid can provide protected power to vital assets in the community such as hospitals, airports and critical industries such as data centers and communications facilities. As the amount of storage grows and these resources become more widely distributed, the entire grid will become more secure and less vulnerable to man-made or natural disasters. Storage has been identified as a critical component in all projected and studied future power systems including smart grids and will also play a vital role in enabling demand-side management schemes without compromising end-users' interest.

ESA Recommendations for an Expanded Electricity Storage Program

The groundwork developed by ESA member companies working with the DOE and Sandia National Labs energy storage program has identified the value that can be

realized with an expanded incentive program at this time. Many technologies have passed the "proof-of-concept" stage and are ready for commercial applications that will provide real benefit to the grid. At a time of growing concern for the environment, expanded storage applications can begin to pay dividends. The following recommendations are made:

1. Expand the scope and size of government funding of storage programs that will interact with the grid at all levels from residential to substation sizes.
2. Provide incentives for national producers of storage systems and key subcomponents
3. Provide funding to demonstrate the benefits of both large-scale storage and short-term balancing of wind energy to improve overall system performance.
4. Provide funding to demonstrate the use of advanced storage to provide reliability enhancement of grid power to critical load customers (hospitals, data centers, critical process manufacturers).
5. Develop legislation to treat energy storage as a necessary component of renewable generation source and provide federal financial support to incent end-users and utilities to develop and deploy electricity storage systems. This should be a tax credit on a significant portion of total storage system investment to help deploy more installations nationwide.
6. Ask FERC to require Independent System Operators (ISOs) to update Market Rules to allow newer energy storage technologies to compete in commercial energy markets and take advantage of the faster response these systems can offer.

Summary

The Electricity Storage Association appreciates the efforts of the Energy Storage Programs at DOE and Sandia Labs. Our members remain committed to accelerating the application of storage at all levels to benefit the environment and improve our lives as we learn to use electricity more efficiently and responsibly in the 21st century.