

**Summary of Testimony of Larry Dickerman, Director of Distribution Engineering Services,
American Electric Power before the House Energy and Commerce Committee March 20th 2007**

American Electric Power (AEP) is one of the nation's largest electricity generators with over 5 million retail consumers in 11 states. AEP is the leader among US utilities for deployment of large-scale battery-based energy storage.

....

AEP supports the adoption of incentives for deployment of distributed stationary energy storage for improvement in security, reliability and performance of the American electric grid infrastructure.

...

Testimony of
Larry Dickerman
Director, Distribution Engineering Services
American Electric Power

Before the House Science and Technology **????** Committee October 3rd, 2007

Good morning Mr. Chairman and distinguished members of the House Committee on **????**.

Thank you for inviting me here today. Thank you for this opportunity to offer the views of American Electric Power (AEP) and for soliciting the views of our industry and others on the significance of deploying energy storage for improvement in security, reliability and performance of the American electric grid infrastructure.

My name is Larry Dickerman, and I am the Director of Distribution Engineering Services of American Electric Power (AEP). Headquartered in Columbus, Ohio. We are one of the nation's largest electricity generators with over 36,000 megawatts of generating capacity and serve more than five million retail consumers in 11 states in the Midwest and south central regions of our nation. But of particular importance for the Committee members here today, AEP is the leading utility in the US for deployment of large-scale energy storage for improved security, reliability and performance of its grid infrastructure. In 2006, AEP installed the first MW-scale NAS battery in the Western hemisphere that has been in commercial operation ever since.

AEP has been an industry leader in advancing and deploying many new technologies such as
...(Sabrina may help identify a few well recognized or least controversial ones on the Hill) ...

AEP has always recognized the values of energy storage for both the grid operation as well as the society that it serves. In 1965 AEP built Smith Mountain's 600MW pumped hydro energy storage in Virginia to reduce the peak demand and better utilize its generation and transmission assets. With the advancement of energy storage technologies and batteries as well as the communications and control that is available through smart grids, it is now possible to deploy a distributed system of energy storage units at strategically located sites on a grid and achieve many more benefits beyond what was once possible with large central energy storage facilities like pumped hydros.

Communications and control, that is an inherent feature of "smart grids", would enhance and expand the benefits of distributed energy storage by allowing collective control of distributed energy storage and a more appropriate reaction to grid needs particularly during severe disturbances and blackouts.

A list of enhanced benefits of energy storage includes but is not limited to the following:

1. Reducing peak load (or load leveling) and hence reducing the costs of service by offsetting high costs of peak generation with lower cost base load generation,
2. Deferring generation, transmission and distribution upgrades
3. Improving service reliability and power quality by being a backup energy source during outages (or blackouts)
4. Improving electric energy security by establishing a multitude of "energy pockets" around the grid
5. Complementing renewable energy sources (buffering intermittency and time shifting energy)
6. Complementing smart grid benefits by taking advantage of its communication and control features
7. Improving the frequency regulation and other ancillary services

8. Much shorter deployment time than most other conventional solutions to many immediate grid problems

AEP Efforts to Deploy Energy Storage

Over the last decade, AEP tested and evaluated the feasibility of some new battery and supercapacitor technologies in its engineering laboratories and finally decided to use sodium sulfide (NAS) battery for the distributed energy storage system to support its grid. The major factors in selecting the NAS technology over the alternative storage technologies are:

- Years of commercial operational experience in Japan at sizes over 1MW
- High energy and power density which translate to small, compact footprint
- High performance capability, including efficiency, cycle life and response time
- No emissions, vibrations or noise concerns
- Relocatable and high degree of recyclability

After testing a small 12.5 kW module in our engineering laboratories and installing a 100kW demonstration unit for peak shaving and backup power to one of our office buildings in 2002, AEP decided to start deploying NAS on its grid on a commercial scale. In a team effort with NGK Insulators (manufacturer of NAS batteries) and S&C Electric Company (manufacturer of power conversion system and as a system integrator), AEP deployed its first commercial 1MW, 7.2 MWh NAS battery in 2006 on a 12kV distribution feeder in Charleston, WV to reduce its daily peak load and, therefore, defer building a new substation for several years. The Department of Energy (DOE) played a critical role in this project by covering the non-repeat engineering costs that were needed for this first-of-a-kind deployment in North America.

Following the successful operation of the first commercial deployment of NAS battery on its grid, on September 11, 2007, AEP announced its new initiative to deploy more energy storage on its system including (see the attached press release):

- 6 More MW of NAS-based energy storage by the end of 2008
- 25 more MW of NAS-based energy storage by the end of this decade
- 1000 more MW advanced energy storage by the end of next decade

A portion of this energy storage will be complementing renewable resources like wind to buffer their intermittency as well as help transfer the available energy from off-peak hours to peak hours when it is needed the most.

AEP Perspective on a Federal Energy Storage Program

The historical problem in the United States has been that we produce excellent pure research on storage and then never take the lead in putting the research to work. For example, the NAS battery was pioneered by Ford Motor Company around 1965 for electric vehicle applications. Others in the US and Europe advanced the technology, but in the mid 1980s, the Tokyo Electric Power Company and NGK, with the support from the Japanese government launched a development and demonstration program that has successfully commercialized the technology for utility-scale applications. Japan is now the world leader in large scale battery storage. Another example is the zinc bromine (ZnBr) battery which was developed by Exxon in the 1970's. Ultimately the technology was commercialized by an Australian company supported by the Australian government. Based on these observations, a (House?) bill should include the following:

1. End users of energy storage should be actively engaged in guiding, cofunding and implementing government supported storage programs
2. Federal funding needs to be balanced between research and "real world" proof of concept projects to advance the technology. A few sample projects are as follows:
 - large scale battery “islanding” capability to improve reliability in rural areas
 - integration of electricity storage with "self healing” smart grids
 - use of electricity storage to improve security to emergency response infrastructure such as police, fire stations and water pumps in sub-level cities like New Orleans
 - compact electricity storage units that can safely be used in residential and small commercial applications as well as in electric-based vehicles that will interact with the grid
3. Legislation to establish Federal financial support is needed to incentivize end-users to overcome their respective entry costs to deploy large-scale energy storage systems. For example, a tax credit on a significant fraction of an energy storage facility investment for grid support would help accelerate deployment across the industry. (Note that in Japan, the government has subsidized early end-users of energy storage for grid support and currently covers one third of the cost of energy storage facilities that support the deployment of wind power systems.)
4. On the State level, utility regulatory commissions should be encouraged to approve energy storage facility investments in the rate base when shown to be cost effective compared to the alternatives.

Summary/ Conclusion

*“ AEP Perspective on a Federal Energy Storage Program”
should serve as the conclusion as it is carries the whole point*

MEDIA CONTACT:

Pat D. Hemlepp
Director, Corporate Media Relations
614/716-1620

ANALYSTS CONTACT:

Julie Sloat
Vice President, Investor Relations
& Strategic Initiatives
614/716-2885

FOR IMMEDIATE RELEASE

AEP TO DEPLOY ADDITIONAL LARGE-SCALE BATTERIES ON DISTRIBUTION GRID

***Installations will boost reliability, integrate wind generation, prepare for future;
new batteries a step toward AEP's goal of 1,000 megawatts of advanced storage***

COLUMBUS, Ohio, Sept. 11, 2007 – American Electric Power (NYSE: AEP), as part of the company's comprehensive effort to integrate new technologies for reliability, renewable energy and energy efficiency to meet customers' future needs, is expanding its use of large-scale battery technology on its electricity grid.

AEP, the only U.S. utility currently using advanced energy storage technology as part of its electricity infrastructure, will be adding stationary sodium sulfur (NAS[®]) battery technology in its West Virginia and Ohio service territories next year.

The company will also work with wind developers to identify a third location within AEP's 11-state service territory for NAS battery deployment next year, using the storage capability to help offset the intermittent nature of wind generation.

AEP has placed an order for the three new NAS batteries with NGK Insulators Ltd. of Japan, the manufacturer and co-developer, along with the Tokyo Electric Power Co., of the technology. AEP anticipates delivery in spring 2008.

The six megawatts added to AEP's system during this deployment is a step toward the company's goal of having 1,000 megawatts of advanced storage capacity on its system in the next decade.

"We are extremely impressed with both the performance and the potential of this technology after using it in real-world applications and from experience we've gained through our long

relationship with NGK," said Michael G. Morris, AEP's chairman, president and chief executive officer. "These new installations will move us a step closer to the full potential of advanced energy storage technologies in areas like reliability improvement, peak-load shaving and the use of stored energy from renewable sources like wind to supplement available generation resources.

"We're first movers on advanced storage among U.S. utilities, a position we've held on a wide number of technologies in our century of existence," Morris said. "Our near-term goal is to have at least 25 megawatts of NAS battery capacity in place by the end of this decade. But this is just a start. Our longer-term goal is to add another 1,000 megawatts of advanced storage technology to our system in the next decade. We will look at the full spectrum of technologies – flow batteries, pumped hydro, plug-in hybrid vehicles and various other technologies in early stages of development today – to determine their feasibility and potential for commercial application.

"In our view, advanced storage technologies, like NAS batteries, and other emerging technologies to increase customers' ability to benefit from energy efficiency will play equally important roles in delaying or avoiding costly future investments in new energy delivery or generation infrastructure," Morris said. "I believe other companies will begin deploying storage technologies in the coming years."

AEP plans to add two megawatts of NAS battery capacity near Milton, W.Va., to enhance reliability and allow for continued load growth in that area. AEP will also add two megawatts of NAS battery capacity near Findlay, Ohio, to enhance reliability, provide support for weak sub-transmission systems and avoid equipment overload.

A specific site for the third NAS battery, which is expected to be integrated with wind generation, will be announced in the coming weeks.

The combined cost for the three installations, including associated site preparation, equipment and control systems, will be approximately \$27 million.

AEP has identified other potential sites for future deployment of advanced storage technologies.

In 2006, AEP installed the first megawatt-class NAS battery system to be used on a U.S. distribution system. That installation, on a substation near Charleston, W.Va., operated by AEP utility unit Appalachian Power, delayed the need for upgrades to the substation. A similar, but much smaller, NAS-based system installed in 2002 at an AEP office park in Gahanna, Ohio, was the first U.S. demonstration of the NAS technology.

The agreement to purchase additional NAS batteries was reached during an August visit to NGK in Japan by Holly Koeppel, AEP's chief financial officer.

“AEP and NGK have had a very close business relationship for more than five years,” Koeppel said. “Our meeting in August generated the agreement for our deployment of additional batteries, but it also provided an opportunity for us to arrange an upcoming meeting with NGK for other Ohio utilities and state officials. Advanced storage technologies like NAS batteries are important to our industry’s future. That’s why we continue to lead the public policy and technology integration efforts.”

The deployment of additional advanced storage capacity is part of a comprehensive AEP initiative focused on preparing the company’s 11-state distribution system to meet future needs of customers.

“We’re looking at where we need to be in the year 2020 and will be making changes to transition our system to the grid of the future,” Morris said. “We have teams of employees examining the current and likely future needs of customers as well as the variety of technologies under development that could meet those needs. We’re looking at ways to improve reliability and efficiency of our system as well as ways to reduce consumption, which delays or avoids the need for additional generation.

“Some elements, like additional large-scale storage systems to enhance reliability, advanced metering systems to provide customers with options for reducing energy use and further integration of renewable resources, are among the likely solutions customers will see in the near term,” Morris said. “We’re also testing distributed energy resources and ‘smart grid’ or ‘self-healing grid’ technologies designed to seamlessly separate sections of the distribution grid when problems develop elsewhere, with customers seeing no disruption in power supply or quality in situations where outages would be likely today. But implementation of these technologies is a bit further off.”

American Electric Power is one of the largest electric utilities in the United States, delivering electricity to more than 5 million customers in 11 states. AEP ranks among the nation’s largest generators of electricity, owning more than 38,000 megawatts of generating capacity in the U.S. AEP also owns the nation’s largest electricity transmission system, a nearly 39,000-mile network that includes more 765 kilovolt extra-high voltage transmission lines than all other U.S. transmission systems combined. AEP’s transmission system directly or indirectly serves about 10 percent of the electricity demand in the Eastern Interconnection, the interconnected transmission system that covers 38 eastern and central U.S. states and eastern Canada, and approximately 11 percent of the electricity demand in ERCOT, the transmission system that covers much of Texas. AEP’s utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia and West Virginia), AEP Appalachian Power (in Tennessee), Indiana Michigan Power, Kentucky Power, Public Service

Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana and east Texas). AEP's headquarters are in Columbus, Ohio.

This report made by AEP and its Registrant Subsidiaries contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934. Although AEP and each of its Registrant Subsidiaries believe that their expectations are based on reasonable assumptions, any such statements may be influenced by factors that could cause actual outcomes and results to be materially different from those projected. Among the factors that could cause actual results to differ materially from those in the forward-looking statements are: electric load and customer growth; weather conditions, including storms; available sources and costs of, and transportation for, fuels and the creditworthiness of fuel suppliers and transporters; availability of generating capacity and the performance of AEP's generating plants; AEP's ability to recover regulatory assets and stranded costs in connection with deregulation; AEP's ability to recover increases in fuel and other energy costs through regulated or competitive electric rates; AEP's ability to build or acquire generating capacity when needed at acceptable prices and terms and to recover those costs through applicable rate cases or competitive rates; new legislation, litigation and government regulation including requirements for reduced emissions of sulfur, nitrogen, mercury, carbon, soot or particulate matter and other substances; timing and resolution of pending and future rate cases, negotiations and other regulatory decisions (including rate or other recovery for new investments, transmission service and environmental compliance); resolution of litigation (including pending Clean Air Act enforcement actions and disputes arising from the bankruptcy of Enron Corp. and related matters); AEP's ability to constrain operation and maintenance costs; the economic climate and growth in AEP's service territory and changes in market demand and demographic patterns; inflationary and interest rate trends; AEP's ability to develop and execute a strategy based on a view regarding prices of electricity, natural gas and other energy-related commodities; changes in the creditworthiness of the counterparties with whom AEP has contractual arrangements, including participants in the energy trading market; actions of rating agencies, including changes in the ratings of debt; volatility and changes in markets for electricity, natural gas and other energy-related commodities; changes in utility regulation, including the potential for new legislation in Ohio and membership in and integration into regional transmission organizations; accounting pronouncements periodically issued by accounting standard-setting bodies; the performance of AEP's pension and other postretirement benefit plans; prices for power that AEP generates and sells at wholesale; changes in technology, particularly with respect to new, developing or alternative sources of generation; other risks and unforeseen events, including wars, the effects of terrorism (including increased security costs), embargoes and other catastrophic events.