Recovery Act funds jumpstart the grid-scale energy storage needed for renewable energy development

By Jon H. Harsch

Washington, Dec. 10 – Testifying in a Senate Energy Committee hearing on grid-scale energy storage Thursday, U.S. Department Of Energy Under Secretary for Science Dr. Steven Koonin explained that the U.S. is moving ahead aggressively to develop new technologies to support the development of renewable energy sources. He noted in particular five areas supported by Recovery Act funding:

> The American Recovery and Reinvestment Act of 2009 provided unprecedented opportunity to accelerate the deployment of grid scale energy storage. On November 24, 2009, Secretary Chu announced the selection of 16 energy storage demonstration projects in conjunction with selection of Smart Grid demonstration projects. The selected energy storage projects ranged over the entire spectrum of grid applications and will enhance grid reliability and efficiency, enable community energy storage options, and allow for greater use of renewable energy resources. Technologies include advanced batteries, flywheels, and compressed air energy storage. The selected awards total $185 million in Recovery Act funding but represent a total project value of $770 million based on substantial recipient cost sharing of between 50 to 80 percent of total project cost. The awards fall into five areas:
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> - Peak Reduction and Wind Farm Integration– three projects were selected with a federal cost of $61 million. The selected projects are intended to demonstrate the potential for battery storage to improve asset utilization, allowing better use of night time wind energy and grid integration of intermittent resources, thus increasing their share of the generation mix. These demonstrations in California and Texas will fund battery facilities in the 8 to 25 megawatt scale, a magnitude larger than current installations.
> - Frequency Regulation Services for Stabilization of the Power Load – one project was selected for an award of $24 million. Electricity generation and load are never exactly synchronized. To balance them, regional system operators slightly shift the load frequency, by either increasing or decreasing power production. Using fast storage devices for these adjustments is twice as effective as using fossil fuel plants. A 20 megawatt flywheel system to be located in Illinois is ten times larger than existing demonstration units.

- Distributed Energy/Community Storage – five projects were selected totaling $20 million, which will allow utilities to experiment with smaller scale storage. Distributed energy storage strengthens and buffers the grid and allows utilities to deal effectively with load fluctuations or renewable generation. Utilities can use storage to provide peaking power during periods of high demand. The selected projects include a 3 megawatt installation in Pennsylvania to provide up to four hours of peak shaving, backup storage for a photovoltaic system in New Mexico, and aggregation of smaller systems into a community energy storage effort in Michigan.
- Compressed Air Energy Storage (CAES) – two projects for grants totaling $54 million have been selected. A 150 megawatt CAES facility will be constructed in New York State using an existing salt cavern. The plant will have sufficient storage to allow full operation in support of the transmission system and market needs and support some 3,800 megawatts of wind planned in the area. A second CAES project will be sited in California. The 300 megawatt plant, using a saline porous rock formation, is situated next to a transmission line receiving power from an expected 4,000 megawatts of new wind. Together, the two new plants will double the world's CAES capacity and provide invaluable experience for developing a fleet of such plants throughout the U.S.
- Promising, emerging technologies – five projects were selected for grants totaling $25 million. These new storage technologies are in their initial stage of development. Funding is intended to bring them to the prototype stage and ready for the market place. Among the projects are a Lithium-Ion battery with nanostructured polymer electrolyte, an iron-chromium based flow battery, and an isothermal compressed air technology that needs no extra fuel.

Noting that "utilities are appropriately cautious," Dr. Koonin concluded that:

> Successful implementation of these Recovery Act projects will depend not only on the diligence of the utilities and entrepreneurs involved, but also on the readiness of public utility commissions and regional system operators to accept the new technologies. As the new projects develop, they will be carefully monitored and fully integrated into the existing energy storage program at the Department of Energy. Results will provide a basis for analytical studies and economic modeling on the role of storage in a more sustainable electric grid.

To read an *Agri-Pulse* report on the Senate Energy Committee's Dec. 10 hearing on grid-scale energy storage, go to: www.agri-pulse.com/uploaded/20091210H2.pdf.

To read written testimony from the Dec. 10 hearing, go to: http://energy.senate.gov.

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