

Electricity Advisory Committee

Smart Grid Subcommittee

Update to the 2008 EAC Report

Smart Grid: Enabler of the New Energy Economy Report **Recommendations**

May 10, 2011

Recommendations from the 2008 EAC Smart Grid Report

<http://www.oe.energy.gov/DocumentsandMedia/final-smart-grid-report.pdf>

1. Create a Smart Grid Program office within DOE.

Update: Completed.

DOE's Office of Electricity Delivery and Energy Reliability (OE) has an active Smart Grid Program, which includes the Smart Grid Investment Grant (SGIG) and the Smart Grid Demonstration Programs (SGDP) funded by the American Recovery and Reinvestment Act of 2009 (ARRA) in addition to the already existing Smart Grid Research & Development (R&D) Program.

FY 2012 OE Budget: \$238 million:

Emphasis on the integration of renewable energy sources, focuses on long-term system planning, expands analytical capabilities, and promotes aggressive approaches to next-generation grid technologies.

- \$193 million for R&D to develop technologies in several crucial areas
 - \$20.8 million for Transmission Reliability and Renewables Integration activity
 - \$35 million for Smart Grid Research and Development
 - \$20 million will support cutting-edge clean energy research and development through a new Smart Grid Technologies and Systems Energy Innovation Hub
 - \$10 million for Power Electronics
 - \$30 million for Cyber Security for Energy Delivery Systems

- Permitting, Siting and Analysis: \$8 million
 - Provide technical assistance to states and regions and to support electricity policy analysis that facilitates development of electricity infrastructure

- Infrastructure Security And Energy Restoration: \$6.2 million
 - Enhance the security and resiliency of the electricity grid, and facilitate recovery from disruptions in energy supply. The increasing complexity and interdependency of national energy infrastructure and expanding globalization of energy markets, in conjunction with the threat of both natural disasters and deliberate attacks, represent significant challenges for the energy industry.
- \$20 million for Advanced Modeling Grid Research
- \$57 million will build on the Recovery-funded work to develop and commercialize grid-scale energy storage that will increase penetration of variable renewable generation into the grid and improve reliability
- \$6 million to improve the reliability and resiliency of critical energy infrastructure and to facilitate recovery from disruptions to the energy supply

2. Develop a roadmap by December 2009 for the achievement of a coordinated nationwide cost-effective deployment of Smart Grid technologies

Update: Not completed.

No specific Smart Grid Roadmap has been completed or is in progress. The purpose of a Roadmap is to provide specific planning, strategy, goals and deadlines for activities for the entire Smart Grid community (i.e., federal, state, regulatory, advocates, academia, etc).

A Smart Grid Implementation Plan is currently being drafted (See also discussion under #4). The *Implementation Plan* will provide a review of activities that OE has currently undertaken and future activities that have been identified. It will not provide any specific planning, goals, or deadlines to be met.

Other OE documents related to Smart Grid that have been produced include (see:

<http://www.oe.energy.gov/smartgrid.htm>):

2010-2014 *Smart Grid Research & Development Multi-Year Program Plan (MYPP)*

2009 *Smart Grid Systems* Report

2009 *Enhancing the Smart Grid: Integrating Clean Distributed and Renewable Generation* Fact Sheet

2010 *U.S. Smart Grid Vendor Ecosystem* Report

See also:

2006 *Roadmap to Secure Control Systems in the Energy Sector*

Including: the supporting interactive energy Roadmap *ieRoadmap*

<http://www.oe.energy.gov/DocumentsandMedia/roadmap.pdf>

3. Request that Congress appropriate the funds needed for the Smart Grid Regional Demonstration Initiative and the Smart Grid Investment Matching Grant Program authorized

under EISA 2007. Also, request that Congress provide NIST with the funds to coordinate the development of a framework as defined in Section 1305 of EISA 2007.

Update: Completed.

SGIG: \$3.4B

SGDP: 684M

Interoperability: \$12M (see below for more information)

- 4. Develop, manage, conduct, and communicate appropriate R&D and deployment projects to identify and prove next steps, consistent with the roadmap, and direct the Smart Grid Regional Demonstration Initiative and Matching Grant Program as authorized in EISA 2007 and referenced above.**

Update: In progress.

As mandated by EISA 2007, OE produced the *Smart Grid Systems Report* in 2009 (as mentioned above), and will publish and updated *Smart Grid Systems Report*. OE is also drafting a *Smart Grid Implementation Plan* as directed by OMB (referenced above). OE has also created two smart grid websites: www.SmartGrid.gov and the Smart Grid Information Clearinghouse www.sgiclearinghouse.org. OE has Smart Grid R&D funds (non-ARRA funds) of @ \$30M.

Electric grid stakeholders representing utilities, technology providers, researchers, policymakers, and consumers have worked together to define the functions of a smart grid through regional meetings convened under the [Modern Grid Strategy](#), a project of the National Energy Technology Laboratory (NETL).

- 5. Conduct a focused education campaign. This DOE campaign should focus on educating consumers on the cost of energy and how those costs can be better managed.**

Update: In progress.

DOE is conducting a series of [Smart Grid E-Forums](#) to discuss various issues surrounding Smart Grid including costs, benefits, value proposition to consumers, implementation, and deployment.

Additional Smart Grid educational brochures released in 2009 (“Smart Grid Stakeholder Books”), target the interests of specific stakeholder groups: [Consumer Advocates](#), [Utilities](#), [Technology Providers](#), [Regulators](#), [Policy Makers](#) and [Environmental Groups](#).

Furthermore, OE also works with public/private partnerships such as the [GridWise Alliance](#) and the Grid Modernization Collaborative to coordinate and collaborate on smart grid development.

The [Federal Smart Grid Task Force](#) was recently established under Title XIII of the Energy Independence and Security Act of 2007 to coordinate smart grid activities across the Federal government.

6. Establish a Smart Grid engineer and technician development program that encourages students to pursue Smart Grid-related technical degrees.

Update: In progress.

There are 51 Smart Grid Workforce training programs being funded by OE. Additionally, OE has allocated some ARRA funds to Sandia and Oakridge National Laboratories to develop training, possibly including fellowships.

7. Work with Congress, industry, state regulators, and other stakeholders to create incentives and standards that will drive a market for Smart Grid-ready controllable devices beyond the meter.

Update: In progress.

As an important first step in the decades-long effort to build a reliable and robust Smart Grid, there exists an immediate need for interoperable standards. Recognizing the urgency to accelerate the standards-development process, NIST received \$10 million from ARRA, through OE, to carry out responsibilities assigned under EISA.

The National Institute of Standards and Technology (NIST) Interoperability Standards:

- NIST has been given "primary responsibility to coordinate development of a framework that includes protocols and model standards for information management to achieve interoperability of smart grid devices and systems."

In April 2009, a three-phase plan was launched to expedite development and promote widespread adoption of Smart Grid interoperability standards:

- Engage stakeholders in a participatory public process to identify applicable standards, gaps in currently available standards, and priorities for new standardization activities.
- Establish a formal private-public partnership to drive longer-term progress.
- Develop and implement a framework for testing and certification

January 2010, NIST released the [NIST Framework and Roadmap for Smart Grid Interoperability Standards](#).

OE has supported development and testing of the IEEE 1547 Series of Standards on interconnecting distributed resources with electric power systems by the [National Renewable Energy Laboratory](#).

In addition, OE has supported the Pacific Northwest National Laboratory and the [GridWise Architecture Council](#) to identify areas for standardization to allow significant levels of interoperation among electric grid system components.