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Office of Electricity Delivery & Energy Reliability

FY 2012 Budget Request

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Winning the Future

President Obama stressed the need to "win the future by out-innovating, out-educating and out-building the global competition."

He emphasized:

- ***Increasing research and development spending to its highest share of GDP since the Space Race***
- ***Increasing investment in clean energy by one third, and setting new targets to have:***
  - ***80% of electricity from clean energy sources by 2035***
  - ***1 million electric vehicles on the road by 2015***

OE's FY 2012 budget request represents a strong commitment to modernizing the grid and providing the reliable, affordable, and secure electric power needed to expand economic recovery, enable the transition to renewable energy sources, and achieve the President's clean energy goals.

FY 2012 Overview

FY 2010 Current Approp	FY 2012 Request
$168.5M	$237.7M

OE's budget reflects the growing realization that a clean energy future is impossible without a modern grid.

- The FY 2012 Budget request emphasizes:
  - Challenging conventional approaches to next-generation grid technologies
  - Increasing grid flexibility for integration of clean energy generation sources
  - Expanded modeling and analytical capabilities

FY 2012 Request

	Request Amount (in thousands)
Clean Energy Transmission and Reliability	60,817
Transmission Reliability and Renewables Integration	*20,817*
Smart Grid Technology and Systems Hub	*20,000*
Advanced Modeling Grid Research	*20,000*
Smart Grid	45,000
Smart Grid R&D	*35,000*
Power Electronics	*10,000*
Energy Storage	57,000
Cyber Security	30,000
Subtotal, Research and Development	**192,817**
Permitting, Siting and Analysis	**8,000**
Infrastructure Security and Energy Restoration	**6,187**
Program Direction	**31,217**
Use of Prior-Year Balances	*-504*
Total, Electricity Delivery and Energy Reliability	**237,717**

Highlights of the FY 2012 Request

The FY 2012 request continues to increase investment in grid modernization to address the challenges posed by an increasingly complex electric grid facing increasingly complex demands.

Highlights in FY 2012 include:

- *Smart Grid Technology and Systems Hub* – Establishing a new energy innovation hub targeting key devices, configurations, and systems to rapidly transition our current grid into a smarter and more efficient one.
- *Energy Storage* – Building on successful Recovery Act investments, demonstrate a new suite of cost-shared grid-level energy storage projects, focusing on promising ARPA-E projects.
- *Advanced Modeling Grid Research* – Expanding research efforts to create a comprehensive, integrated modeling architecture that provides a more sophisticated understanding of the electric system

Smart Grid Technology and Systems Hub

FY 2012 Request: $20M

- One of DOE's three new Energy Innovation Hubs. Each Hub consists of a highly integrated research team, bringing together top talent in science, engineering, and policy to focus on a single essential challenge in energy.
- This Hub targets key devices, configurations, and systems to accelerate the transformation of our current grid to the smarter, more efficient grid needed to support a clean energy economy.
- Potential topics include:
  - self-healing substations
  - self-regulating conductors
  - novel designs for system components like transformers

Energy Storage

FY 2012 Request: $57M

- Energy storage has gained importance in the field as a potential solution to many of the problems being experienced on the electric grid.
- Focuses on grid-scale storage technologies that:
  - Reduce power disturbances
  - Improve system flexibility, better incorporating intermittent renewable resources
  - Reduce generation needed at peak demand
- FY 2012 builds on successful Recovery Act demonstration projects through:
  - A new suite of grid-scale energy storage demonstrations, emphasizing promising ARPA-E projects
  - Collaborations with utilities and renewable developers to field-test promising technologies
  - Expanding existing activities integrating renewable energy resources into the grid

Advanced Modeling Grid Research

FY 2012 Request: $20M

- Achieving the President's clean energy vision requires a more detailed understanding of the electric grid than we have today.
- Advanced Modeling Grid Research helps meet this vision by developing sophisticated algorithms, models and capabilities to better analyze and predict grid behavior, and then applying this understanding using real-time electric system data to improve grid planning and operations.
- The FY 2012 request reflects an increased commitment to:
  - Address intermittency and faster grid dynamics
  - Integrate various modeling platforms to provide an end-to-end system framework
  - Capture interrelationships of multiple systems, such as communications layer, controls, and the physical electric system

Clean Energy Transmission and Reliability ($60.8M)

Transmission Reliability and Renewables Integration ($20.8M)

Supports the transmission-level integration of clean energy sources and advanced sensors to give system operators real-time information and improve system operations .

Smart Grid Technology and Systems Hub ($20M)

Supports establishment of a new energy innovation hub targeting key devices, configurations, and systems to rapidly transition our current grid into a smarter and more efficient one.

Advanced Modeling Grid Research ($20M)

Supports development of sophisticated algorithms, models and capabilities to better analyze and predict grid behavior.

Smart Grid Research and Development ($45M)

Smart Grid Research and Development ($35M)

Supports the development of an efficient, fully integrated “smart” grid through the integration of digital information and communication technologies into the power system.

Power Electronics ($10M)

Supports the development of advanced, high-power devices that provide flow control for the grid while improving reliability and security.

Energy Storage ($57M)

Supports the development of grid scale storage technologies to reduce power disturbances, reduce generation need at peak demand, and improve system flexibility to better incorporate renewable resources.

Cyber Security for Energy Delivery Systems ($30M)

Addresses vulnerabilities within the Nation's electricity delivery system to reduce the risk of energy disruptions due to cyber attacks, a fundamental need with the growing sophistication of cyber threats.

Permitting, Siting and Analysis ($8M)

Provides technical assistance to states and regions on electricity policies and programs that increase access to reliable, affordable and sustainable energy sources, including analysis of emerging system challenges and advanced transmission approaches.

Infrastructure Security and Energy Restoration ($6.2M)

Leads national efforts to enhance the security of the Nation's critical energy infrastructure against threats and hazards and carries out the Department's Energy Sector-Specific Agency responsibilities, protecting the Nation's critical energy infrastructure and key resources.