Electricity Delivery and Energy Reliability

(discretionary dollars in thousands)

	FY 2011 Current	FY 2012 Enacted	FY 2013 Request	FY 2013 vs. FY 2012	
				$	%
Research and Development	102,060	99,136	103,400	+4,264	+4.3%
Permitting, Siting and Analysis	6,000	6,976	6,000	-976	-14.0%
Infrastructure Security and Energy Restoration	6,100	5,981	6,000	+19	+0.3%
Program Direction	27,610	27,010	27,615	+605	+2.2%
Subtotal, Electricity Delivery & Energy Reliability	***141,770***	***139,103***	***143,015***	***+3,912***	***+2.8%***
Adjustments	-3,600	0	0	N/A	N/A
Total, Office Electricity Delivery & Energy Reliability	**138,170**	**139,103**	**143,015**	**+3,912**	**+2.8%**

PROGRAM DESCRIPTION

The **Office of Electricity Delivery and Energy Reliability (OE)** leads national efforts to modernize the electric grid, enhance security and reliability of energy infrastructure, and facilitate recovery from disruptions to the energy supply. As stated in the President's *A Policy Framework for the 21st Century Grid*, a smarter, modernized electric grid is fundamental to transforming the Nation's energy system and securing US leadership in a clean energy future. OE supports activities that enable innovation across the energy sector, empower American consumers, and secure our energy future. OE consists of three programs: Research and Development; Permitting, Siting and Analysis; and Infrastructure Security and Energy Restoration.

The **Research and Development (R&D)** program works with industry, academia, and government to develop technologies that enhance the electric grid. It consists of five subprograms. Clean Energy Transmission and Reliability focuses on grid modernization technologies at the transmission level, while the Smart Grid Research and Development subprogram focuses at the distribution level. The Electricity Systems Hub addresses the interconnection between transmission and distribution. The Energy Storage and Cyber Security subprograms support technologies that are applied across the entire grid space.

The **Permitting, Siting, and Analysis (PSA)** program provides expert technical assistance to states, tribes and regions on electricity policies, programs and market mechanisms that increase access to reliable, affordable and sustainable energy sources. PSA provides analysis for the long-term, interconnection-level planning required for the continued growth and integration of renewable and other clean energy resources. In addition, the program implements the transmission provisions of the Energy Policy Act of 2005, and administers the international electricity regulatory program through cross-border permitting.

The **Infrastructure Security and Energy Restoration (ISER)** program leads national efforts to secure the Nation's critical infrastructure against threats and hazards. It ensures the reliability, survivability and resiliency of energy infrastructure by coordinating the Department's response to energy emergencies, providing assistance in securing critical energy infrastructure, coordinating technical and policy support for control systems security, and collaborating with all levels of government and industry to facilitate recovery from energy supply disruptions and national security incidents. This program carries out the Department's responsibilities as the lead Energy Sector Specific Agency for protecting the nation's critical energy infrastructure.

Program Direction funds federal staff and support services for the management, oversight and technical direction of OE.

PROGRAM HIGHLIGHTS

The FY 2013 budget request represents the Department's commitment to fiscal discipline and management efficiency, while ensuring that progress towards modern electric infrastructure is maintained. The request focuses on activities that increase electricity reliability and security nationwide by taking a systems-level approach to grid modernization, developing the computational capabilities to improve system planning and operations, and emphasizing the physical and cyber security of both new technologies and legacy energy systems.

FY 2013 will see the establishment of the Electricity Systems Hub to address the grand challenges associated with seamlessly integrating, coordinating and facilitating the modernization of the electric transmission and distribution systems. The Hub will focus on the seam between transmission and distribution systems, physically manifest as a substation, as the convergence of power flows, information flows, markets and regulations. The Hub will bring together a broad, multidisciplinary group of experts in applied science, technology, economics, and policy, an approach that serves well to address the barriers associated with this "pinch point" of grid modernization.

To address the growing complexity of the electric system, the FY 2013 request highlights the development of the computational, mathematical, and scientific understanding of grid operations and interdependencies necessary to improve system planning and operations. The program will accelerate the performance and predictive capabilities of operational tools, using real-time data from sensors nationwide, to enhance grid resilience to events that drive cascading blackouts. It will enable system models that better predict system behavior and improve large-scale system planning, reducing operational redundancies and maximizing the use of existing electric infrastructure.

The FY 2013 request continues to emphasize the security of electric systems and infrastructure as fundamental to the process of grid modernization. The program works closely with electric sector stakeholders to develop advanced cyber security technologies and risk mitigation solutions designed to address the unique needs of energy delivery systems. In close collaboration with the energy industry, national labs and academic community, the FY 2013 request will include support for cutting edge cybersecurity research into resilient networks and communications, integrated threat analyses, and the development of mechanisms to share actionable threat information among stakeholders in real-time.

SIGNIFICANT FUNDING CHANGES – FY 2012 Enacted to FY 2013 Request ($ in millions)

Electricity Systems Hub (FY 2012 $0; FY 2013 $20M) .....+$20.0M
The increase reflects the initial year of funding for a new Hub that will address the critical issues and barriers associated modernization of the electric grid.

Clean Energy Transmission and Reliability (FY 2012 $25.4M; FY 2013 $24M) .....-$1.4M
Supports continued efforts to develop advanced transmission-driven technologies to improve grid reliability, efficiency, and security. Decrease primarily reflects the closeout of research activities focused on the integration of variable resources into the transmission system. The request continues the advancement of modeling and computational capabilities needed to transform the tools and algorithms that underpin electric system function to improve grid planning and operations.

Smart Grid Research and Development (FY 2012 $23.9M; FY 2013 $14.4M) .....-$9.5M
Supports ongoing research targeted to modernization of the electric system at the distribution level. The decrease reflects the closeout of funding for power electronics research, consistent with the Department's shift in emphasis from applied research in power electronics for grid-scale applications to focus on current device compositions and foundational research carried out by ARPA-E and the Office of Science. It also reflects reduced funding for microgrid research, and scaled back research into smart charging of electric vehicles, integration of distributed energy resources and standards development, and communication and control technologies.

Energy Storage (FY 2012 $19.9M; FY 2013 15.0M)..... -$4.9M
Continues efforts to lower the cost and improve the performance of energy storage technologies for utility-scale applications. The reduction results from discontinuation of projects on Na-ion batteries and low cost, long life Li-ion batteries for community energy storage, and greater leveraging of State funding and collaboration with other DOE offices.

Permitting, Siting and Analysis (FY 2012 $7.0M; FY 2013 $6.0M) .....-$1.0M
Supports continued efforts to assist states, regional entities, and tribes to facilitate the development of reliable and affordable electricity infrastructure, as well as regulatory responsibilities for electric energy exports and international transmission permits. The decrease reflects an increase in FY 2012 to support enhanced collaborative efforts with states, regional entities, and tribes on advanced transmission systems and market approaches, and a one-time litigation settlement.