FY 2015 Budget Request

Office of
Electricity Delivery and Energy Reliability



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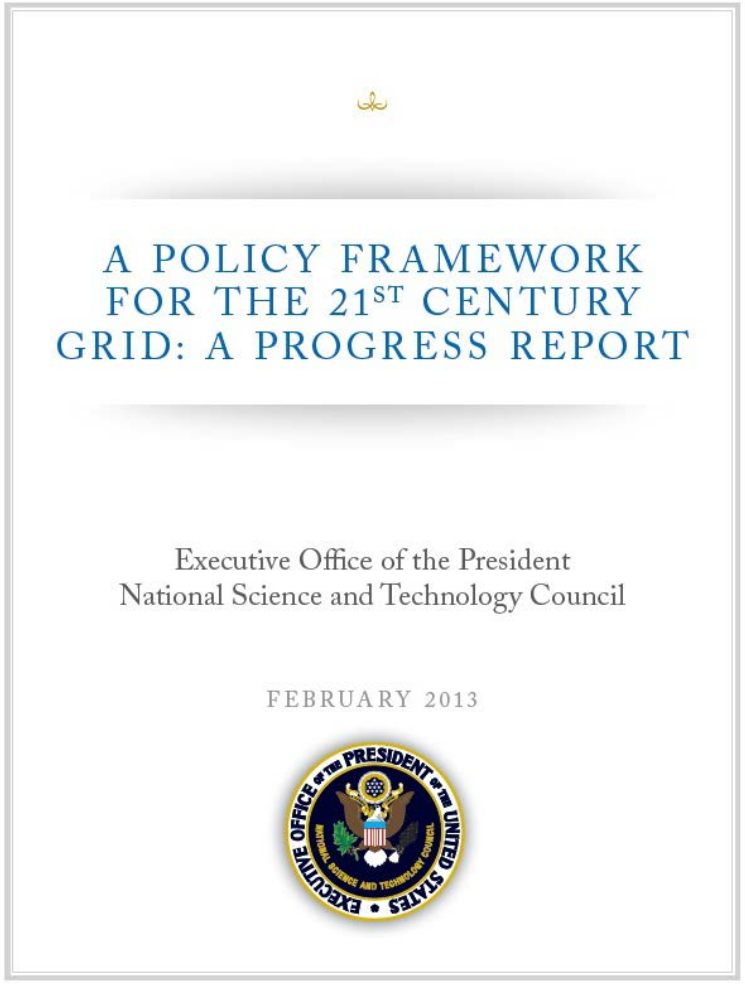
The Importance of a Modern Grid



"...A smarter, modernized, and expanded grid can serve as a platform for American leadership in a clean and secure energy future and power a National economy that is built to last."

- *A Policy Framework for the 21st Century Grid: A Progress Report*
White House Report, February 2013

OE Mission

The Office of Electricity Delivery and Energy Reliability (OE) drives electric grid modernization and resiliency in the energy infrastructure. OE leads the Department of Energy's efforts to ensure a resilient, reliable, and flexible electricity system. OE accomplishes this mission through research, partnerships, facilitation, modeling and analytics, and emergency preparedness.

OE's mission aligns with the Department's strategic goals:

Advance foundational science, innovate energy technologies, and inform data-driven policies that enhance U.S. economic growth and job creation, energy security, and environmental quality, with emphasis on implementation of the President's Climate Action Plan to mitigate the risks of and enhance resilience against climate change.

OE FY 2015 Request

FY 2013 Current	FY 2014 Enacted[1]	FY 2015 Request
$129M	$147M	$180M

	Request Amount (in thousands)
Clean Energy Transmission and Reliability	36,000
Transmission Reliability	*18,000*
Advanced Modeling Grid Research	*11,000*
Energy Systems Predictive Capability	*7,000*
Smart Grid	24,400
Cyber Security for Energy Delivery Systems	42,000
Energy Storage	19,000
National Electricity Delivery	7,000
Infrastructure Security and Energy Restoration	22,600
Infrastructure Security and Energy Restoration	*8,000*
Operational Energy and Resilience	*14,600*
Program Direction	29,000
TOTAL, Electricity Delivery and Energy Reliability	**180,000**

[1]*Funding shown before SBIR/STTR transfers*

Highlights of the FY 2015 Request

Clean Energy Transmission and Reliability

FY 2015 Request: $36 M

The CETR program develops the monitoring, analytical decision support, and control capabilities necessary to operate and plan the grid. It also enhances reliability and resilience through modeling and analysis of the interdependent energy systems.

Transmission Reliability

– Accelerates development of synchrophasor-based, cyber-protected software applications for grid operator control rooms. These applications will provide grid operators with advanced analysis, visualization, and decision-support tools, maximizing the value of synchrophasor data now available and improving reliability.

Advanced Modeling Grid Research

– Focuses on research to develop the model-based analytical tools, and computational and mathematical advancements that are the foundation for the next-generation energy management system, used by grid operators to monitor and control the performance of the electric system

Energy Systems Predictive Capability

– Develops an analytical capability to assess energy system risks and reliability, and to produce analyses assessing the impact of emerging events. The request further builds an analysis capability for use in near- and long-term risk assessment, modeling, and simulation.

Highlights of the FY 2015 Request

Smart Grid R&D

FY 2015 Request: $24.4 M

The Smart Grid program addresses the modernization of the electric grid at the distribution level, with the goal of improving reliability as well as operational efficiency, resiliency, and disaster recovery

The FY 2015 request continues research to transform electric distribution systems through the development of new tools, innovative grid technologies, and advanced concepts that will help improve the reliability, resiliency, and efficiency of the grid The FY 2015 request focuses on:

- Expanding microgrid research and development, including additional partnerships to deploy microgrids to increase the resiliency of the electric infrastructure at the state, local, and community level

- Investing in the evolution towards higher performance smart grids, capitalizing on the recent surge in advanced technology deployments by exploring how new assets and information streams can be combined to greater advantage than traditional control and end-user involvement

Cybersecurity for Energy Delivery Systems

FY 2015 Request: $42 M

The CEDS program develops advanced cybersecurity technologies and operational capabilities to enhance the reliability and resiliency of the Nation's energy infrastructure by reducing the risk of energy disruptions due to cyber events.

The FY 2015 request supports efforts to strengthen the energy infrastructure against cyber threats, working closely with the Energy Sector and within the U.S. Government:

- Supports research, development, and demonstration of cutting edge cybersecurity solutions in the Energy Sector
- In partnership with industry, accelerates information-sharing of cyber threats to enhance situational awareness
- Expands implementation of tools such as the Cybersecurity Capability Maturity Models to guide best practices and cybersecurity investment decisions in the energy sector
- Continues efforts to build an effective, timely, and coordinated cyber incident management capability for operation, information exchange, and technology in the energy sector

Highlights of the FY 2015 Request

Energy Storage

FY 2015 Request: $19 M

The Energy Storage program conducts research, development, and demonstrations to enhance the stability, reliability, and flexibility of the electric grid by accelerating the development and deployment of advanced grid-scale energy storage in the electric system

The FY 2015 request addresses challenges in cost reduction, system engineering, performance improvement and validation, value recognition, and deployment confidence for energy storage, including:

- Understanding degradation mechanisms to prevent premature failure of systems,
- Development of utility/regulator-friendly design and analysis tools especially for grid resilience
- Expansion of standards beyond battery performance testing to include grid integration, control logic, safety, reliability and packaging
- Expanded utilization of grid-scale test beds, and collaborative field trials with states, utilities and storage providers, to characterize storage benefits, grid integration issues, safety and performance.

National Electricity Delivery

FY 2015 Request: $7 M

The National Electricity Delivery program provides technical assistance to states, regions, and tribes to help them develop and improve their programs, policies, and laws to facilitate the development of reliable and affordable electricity infrastructure. It also authorizes the export of electricity, issues permits for cross-border transmission lines, and coordinates Federal transmission permitting on Federal lands.

The FY 2015 request:

- Provides an increase for state and regional assistance in emerging issues, such as state performance-based regulations

- Supports implementation of new pre-application regulations to improve permitting of transmission projects involving Federal lands

Infrastructure Security and Energy Restoration

FY 2015 Request: $22.6 M

The ISER program leads national efforts, in cooperation with public and private sector stakeholders to enhance the reliability, survivability, and resiliency of the U.S. energy infrastructure, while also improving national energy security by addressing energy infrastructure interdependencies based on risk and consequences.

Infrastructure Security and Energy Restoration

– The FY 2015 request for the ISER program supports the development of advanced mitigation solutions for hardening infrastructure against all hazards, including events such as geomagnetic disturbances and physical threats as well as devastating weather events

Operational Energy and Resilience

– The FY 2015 request supports the expansion of the OER program, begun in FY 2014, to provide an enhanced capability to enable the Department to better protect against and mitigate threats and hazards to the energy infrastructure:

- Continues development of real-time visualization capability and situational awareness reporting
- Supports the build-out of the Energy Resilience and Operations Center (E-ROC) that will enable DOE to continually monitor energy system status and facilitate communication with sector stakeholders
- Provides additional personnel to develop and implement regionally tailored, energy resilience approaches with state and local governments, private sector partners and other federal stakeholders, and to provide real-time monitoring, modeling and analysis required to support E-ROC.