

Statement of Kevin M. Kolevar
Director, Office of Electricity Delivery & Energy Reliability
Department of Energy

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Mr. Chairman and Members of the Committee, thank you for this opportunity to testify on the President's Fiscal Year (FY) 2008 budget request for the Office of Electricity Delivery and Energy Reliability.

The mission of the Office of Electricity Delivery and Energy Reliability (OE) is to lead national efforts to modernize the electricity delivery system, enhance the security and reliability of America's energy infrastructure, and facilitate recovery from disruptions to energy supply. These functions are vital to the Department of Energy's (DOE) strategic goal of protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally responsible energy.

The President's FY 2008 budget includes \$114.9 million for OE in FY 2008, which is an 8 percent decrease from the FY 2007 request. This includes \$86.0 million for Research and Development activities, \$11.6 million for Operations and Analysis activities, and \$17.4 million for Program Direction. As DOE is currently preparing a spending plan in accordance with the terms of the 2007 Continuing Resolution, my testimony on the FY 2008 budget request reflects a comparison to the Administration's FY 2007 request.

When Thomas Edison opened the Pearl Street Station in lower Manhattan on September 4, 1884, he could hardly have foreseen of the role electricity would play in the development of American society. Although the demand for electric lighting and power initially drove the station's construction, electricity ultimately stimulated and enabled technological innovations that reshaped America. Today, the availability and access to electricity is something that most Americans take for granted. Most people cannot describe what it is or where it comes from. Yet, it is vital to nearly every aspect of our lives from powering our electronics and heating our homes to supporting transportation, finance, food and water systems, and national security.

The Energy Information Administration has estimated that by the year 2030, U.S. electricity sales are expected to increase by 43 percent from their 2005 level. Although this is a positive indicator of a growing economy, it is also a significant amount of new demand on an electricity infrastructure that is already stressed and aging. With this in mind, OE's FY 2008 budget request reflects a commitment to implement the directives of the Energy Policy Act of 2005 (EPACT), support research of breakthrough technologies, and coordinate Federal response to temporary disruptions in energy supply to ensure a reliable and secure electricity infrastructure for every American in the coming decades.

Meeting our future electricity needs will not be solved by focusing only on expanding our generation portfolio or on energy conservation. Perhaps the greatest challenge today, as it was in Edison's time, is building the elaborate network of wires and other facilities needed to deliver energy to consumers reliably and safely.

RESEARCH AND DEVELOPMENT

The FY 2008 budget request of \$86.0 million for the Research and Development (R&D) program within OE funds four activities: High Temperature Superconductivity; Visualization and Controls; Energy Storage and Power Electronics; and Renewable and Distributed Systems Integration.

Over the past eighteen years, DOE has invested more than \$500 million in the science and development of high temperature superconductivity. Superconductivity holds the promise of addressing capacity concerns by maximizing use of available "footprint" and limited space, while moving power efficiently and reliably. It also supports advanced substation and interconnection designs that allow larger amounts of power to be routed between substations, feeders, and networks using less space and improving the security and reliability of the electric system.

Today, the High Temperature Superconductivity activity continues to support second generation wire development as well as research on dielectrics, cryogenics, and cable systems. This activity is being refocused to address a near-term critical need within the electric system to not only increase current carrying capacity, but also to relieve overburdened cables elsewhere in the local grid. The superconductivity industry in the United States is now at the critical stage of moving from small business development to becoming a part of our manufacturing base.

Enhanced security for control systems is critical to the development of a reliable and resilient modern grid. The Visualization and Controls Research & Development activity focuses on improving our ability to measure and address the vulnerabilities of controls systems, detect cyber intrusion, implement protective measures and response strategies, and sustain cyber security improvements over time. The FY 2008 request reflects an increase of \$7.75 million related to support this effort.

This activity is also developing the next generation system control and data acquisition (SCADA) system that features GPS-synchronized grid monitoring, secure data communications, custom visualization and operator cueing, and advanced control algorithms. Advanced visualization and control systems will allow operators to detect disturbances and take corrective action before problems cascade into widespread outages. The need to improve electric power control systems security is well-recognized by both the private and public sectors.

The Energy Storage and Power Electronics activity proposes an increase of \$3.80 million in FY 2008 to: 1) leverage understanding gained from previous Energy Storage demonstration activities to research and develop new advanced higher energy density

materials and storage devices for utility scale application; and 2) focus on enhanced research in Power Electronics to improve material and device properties needed for transmission-level applications.

Large scale, megawatt-level electricity storage systems, or multiple, smaller distributed storage systems, could significantly reduce transmission system congestion, manage peak loads, make renewable electricity sources more dispatchable, and increase the reliability of the overall electric grid.

The Renewable and Distributed Systems Integration Research & Development activity completed the transition away from generation technology activities in FY 2007 and will focus on grid integration of distributed and renewable systems in FY 2008, which is a logical step in advancing clean energy resources to address future challenges.

PERMITTING, SITING, AND ANALYSIS

In FY 2008, the Department is requesting \$5.7 million for the Permitting, Siting, and Analysis (PSA) Office within the Operations and Analysis subprogram, which implements mandatory requirements set by EPACT to modernize the electric grid and enhance reliability of the energy infrastructure by contributing to the development and implementation of electricity policy at the Federal and State level. The Permitting Siting and Analysis Office is also tasked with analyzing transmission congestion, proposing energy corridors for the Secretary's consideration, and coordinating Federal agency review of applications to site transmission facilities on Federal lands.

The Department published its *National Electric Transmission Congestion Study* on August 8, 2006, in compliance with Section 1221(a) of EPACT, which requires DOE to prepare a study of electric transmission congestion every three years. The study named more than fifteen areas of the Nation with existing or potential transmission congestion problems. The study identifies Southern California and the East Coast from New York City to Washington, D.C., as "Critical Congestion Areas," because transmission congestion in these densely populated and economically vital areas is especially significant.

During the development of the study, which relied on extensive consultation with States and other stakeholders, the Department provided numerous opportunities for discussion and comment by States, regional planning organizations, industry, and the general public. OE intends to supplement the tri-annual Congestion Studies study by publishing annual progress reports on transmission improvements in the congested areas.

Section 1221(a) also requires the Secretary to issue a report based on the August 8 Congestion Study. In this report, if consumers in any geographic area are being adversely affected by electric energy transmission capacity constraints or congestion, the Secretary may, at his discretion, designate such an area as a National Interest Electric Transmission Corridor (National Corridor).

Because of the broad public interest in the implementation of Section 1221(a), the Department invited and received over 400 public comments on the designation of National Corridors. The Department continues to evaluate these comments, and has not yet determined whether, and if so, where, it would be appropriate to propose designation of National Corridors. Prior to issuing a report that designates any National Corridor, the Department will first issue a draft designation to allow affected States, regional entities, and the general public additional opportunities for review and comment.

Another major effort involves the implementation of Section 368 of EPACT, which requires the designation of energy right-of-way corridors on Federal lands in the eleven contiguous Western States. An interagency team, with DOE as the lead agency, conducted public scoping meetings concerning the designation of corridors in each of the eleven contiguous Western States. The agencies plan to publish a draft Programmatic Environmental Impact Statement for the designation of the energy corridors in late spring of 2007 and will solicit public comments.

In August 2006, DOE and eight other Federal agencies signed a *Memorandum of Understanding* (MOU) that clarifies the respective roles and responsibilities of Federal agencies, state and tribal governments, and transmission project applicants with respect to making decisions on transmission siting authorizations. DOE is preparing to implement its responsibilities under the new section 216(h) of the Federal Power Act to coordinate with these eight other Federal agencies to prepare initial calendars, with milestones and deadlines for the Federal authorizations and related reviews required for the siting of transmission facilities. DOE will maintain a public website that will contain a complete record of Federal authorizations and related environmental reviews and will work closely with the lead Federal NEPA agency to encourage complete and expedited Federal reviews. DOE is currently considering the procedures it will use in carrying out this program.

INFRASTRUCTURE SECURITY AND ENERGY RESTORATION

The President has designated the Department of Energy as the Lead Sector Specific Agency responsible for facilitating the protection of the Nation's critical energy infrastructure. The Infrastructure Security and Energy Restoration (ISER) activity of the Operations and Analysis subprogram is responsible for coordinating and carrying out the Department's obligations to support the Department of Homeland Security in this important national initiative. The FY 2008 request is for \$5.9 million in funding for Infrastructure Security and Energy Restoration within the Operations and Analysis subprogram.

The Infrastructure Security and Energy Restoration activity fulfills DOE's responsibilities as defined in Homeland Security Presidential Directives 7 and 8 for critical infrastructure identification, prioritization, and protection and for national preparedness. In times of declared emergencies, this Office also coordinates Federal efforts under the National Response Plan to assist State and local governments and the private sector in the restoration of electrical power and other energy-related activities.

In the event of a large-scale electrical power outage caused by natural disasters such as hurricanes, ice storms, or earthquakes, DOE personnel will deploy to the affected region to assist in recovery efforts. During the 2005 hurricane season, DOE was specifically deployed to respond to five hurricanes: Dennis, Katrina, Ophelia, Rita and Wilma. In such instances, DOE coordinates all Federal efforts to assist local authorities and utilities in dealing with both measures to restore power and to resolve other issues related to fuel supply.

The Infrastructure Security and Energy Restoration Office also fosters greater awareness of the regional scope of energy interdependencies by working with States to develop energy assurance plans that address the potential cascading effects of energy supply problems. Exercises are conducted with States and Federal partners to help sharpen this focus. Finally, staff work with States and DHS in emergency situations to help resolve issues brought on by temporary energy supply disruptions, such as the winter 2007 propane shortage in Maine.

CONCLUSION

In his 2007 State of the Union address, President Bush emphasized the importance of continuing to change the way America generates electric power and highlighted significant progress in integrating clean coal technology, solar and wind energy, and clean, safe nuclear energy into the electric transmission system.

Technologies such as power electronics, high temperature superconductivity, and energy storage hold the promise of lower costs and greater efficiency, and also directly enhance the viability of clean energy resources by addressing issues such as intermittency, controllability, and environmental impact.

Federal investment in the research, development, and deployment of new technology combined with innovative policies and infrastructure investment, is essential to improving grid performance and ensuring our energy security, economic competitiveness, and environmental well-being.

This concludes my statement, Mr. Chairman. I look forward to answering any questions you and your colleagues may have.