

**Statement by Christopher Smith
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**FY 2015 Appropriations Hearing
House Committee on Appropriations
Subcommittee on Energy and Water Development**

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Chairman Simpson, Ranking Member Kaptur and Members of the Subcommittee, it is my pleasure to appear before you today to discuss the Department of Energy's (DOE) Office of Fossil Energy's (FE) programs.

The Office of Fossil Energy (FE) advances technologies related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels which are essential to our Nation's security and economic prosperity. FE leads Federal research, development, and demonstration efforts on advanced carbon capture, and storage (CCS) technologies to facilitate achievement of the President's climate goals. FE also develops technological solutions for the prudent and sustainable development of our unconventional domestic resources.

FE also manages the Nation's Strategic Petroleum Reserve (SPR). The SPR, with a capacity of 727 million barrels, serves as the largest stockpile of government-owned emergency crude oil in the world. The SPR helps ensure U.S. energy security by providing protection against disruptions in U.S. oil supplies. It also allows the United States to meet, in combination with commercial stocks, its International Energy Agency (IEA) obligation to maintain strategic oil stocks equal to ninety days of net oil imports.

In addition to the SPR, FE oversees the Northeast Home Heating Oil Reserve, which provides a short-term supplement to private home heating oil supplies in the Northeast in the event of a supply interruption. The Office also manages the Naval Petroleum Reserves.

Fiscal Year 2015 Budget Request

President Obama's Fiscal Year (FY) 2015 budget seeks \$711.0 million for FE to advance technologies related to the reliable, efficient, affordable and environmentally sound use of fossil fuels as well as manage the Strategic Petroleum Reserve and Northeast Home Heating Oil Reserve to provide strategic and economic security against disruptions in U.S. oil supplies.

The FY 2015 request includes \$475.5 million for FER&D, \$205.0 million for the Strategic Petroleum Reserve, \$1.6 million for the Northeast Home Heating Oil Reserve and \$19.95 million for the Naval Petroleum Reserves. The Northeast Home Heating Oil Reserve FY 15 budget request includes the use of \$6 million in prior year balances bringing it to a total of \$7.6 million.

Beginning with the FER&D program, I would like to provide an overview of the President's Fiscal Year 2015 budget request for the Office of Fossil Energy.

Fossil Energy Research and Development

The President's FY 2015 budget requests \$475.5 million for the DOE's FER&D portfolio. FE leads Federal research, development, and demonstration efforts on advanced carbon capture and storage (CCS) technologies to facilitate achievement of the President's climate goals. FE also develops technological solutions for the prudent and sustainable development of our unconventional domestic resources.

In FY 2015, Fossil Energy Research and Development will continue to focus on carbon capture and storage and activities that increase the efficiency and availability of systems integrated with CCS.

CCS Demonstrations

FER&D manages the Clean Coal Power Initiative program along with two American Recovery and Reinvestment Act CCS demonstration programs: FutureGen 2.0 and the Industrial Carbon Capture and Storage program under the CCS Demos program.

The FY 2015 request includes \$25 million for a new demonstration program, Natural Gas Carbon Capture and Storage (NG-CCS), to support projects to capture and store carbon emissions from natural gas power systems. The ability to demonstrate advanced technologies at a scale that has been developed within the FER&D or other R&D programs is an important benefit of the demonstration programs.

The requested funds would be competed to fund work that demonstrates technology to capture and store more than 75 percent of the carbon from treated emissions from a natural gas power system.

Carbon Capture & Storage and Power Systems

The CCS and Power Systems program conducts research to reduce carbon emissions by improving the performance and efficiency of fossil energy systems and CCS technologies. The FY 2015 budget request for the program is \$277.4 million. This includes \$34 million for National Energy Technology Laboratory (NETL) staff to conduct in-house coal R&D.

Carbon Capture. The President's FY 2015 budget requests \$77 million for carbon capture R&D. The Carbon Capture activity is focused on the development of post-combustion and pre-combustion CO₂ capture and compression technologies for new and existing fossil fuel-fired power plants and industrial sources.

The President's FY 2015 budget request includes:

- *Post-combustion CO₂ capture technology* – \$65 million for R&D focused on capturing CO₂ from flue gas after the fuel has been consumed/combusted.
- *Pre-combustion CO₂ capture technology* – \$12 million for R&D of systems that capture and separate the CO₂ from mixed gas streams prior to combustion or utilization of the gas.

The decrease in funding for post-combustion R&D reflects a level sufficient to continue scale-up of 2nd generation technologies through large-scale pilot projects and laboratory and bench-scale testing of transformational technologies for fossil-fuel-fired plants.

Carbon Storage. The President's FY 2015 budget requests \$80.1 million for carbon storage R&D. The overall goal of the Carbon Storage Program is to develop and validate technologies to ensure safe and permanent geologic storage of captured CO₂. Development and validation of these technologies is critical to ensure industry and regulatory agencies have the capability to assess, monitor and mitigate storage risks for CO₂ onshore and offshore storage and ensure the viability of carbon storage as an effective technology solution that can be implemented on a large-scale to mitigate carbon emissions.

In FY2015, the Regional Carbon Sequestration Partnership (RCSPs) subactivity will be renamed Storage Infrastructure to better represent the characterization and field activities that occur in the RCSPs and other small and large-scale field projects in a variety of geologic reservoirs in onshore and offshore settings.

Funding for Carbon Storage activities is decreased while continuing the Storage Infrastructure activities on large-scale injection operation and monitoring activities and supporting small-scale field projects for other geologic storage formation classes. Funding for Geologic Storage Technologies is decreased while continuing to focus on understanding risks and addressing geo-mechanical impacts such as induced seismicity.

The FY 2015 request includes:

- *Storage Infrastructure* – \$60.8 million for the development and validation of technologies, infrastructure, and human capital through the RCSPs and other small- and large-scale field projects. These field projects conduct regional and site-specific characterization and validation; simulation and risk assessment; and application of monitoring, verification, accounting and assessment (MVAA) technologies for various storage reservoirs. (MVAA of geologic storage sites addresses safety and environmental concerns; verifies migration of CO₂ to meet regulatory requirements; and accounts for greenhouse gas (GHG) emissions mitigation to help achieve GHG reduction goals).
- *Geologic Storage Technologies* – \$8.5 million focused on developing and validating storage and simulation and risk assessment technologies that have the potential to safely, permanently, and cost effectively store CO₂ in both

conventional and unconventional geologic reservoirs for onshore and offshore project settings.

- *Monitoring, Verification, Accounting and Assessment* – \$4.5 million for the development and validation of technologies in field projects to monitor CO₂ at atmospheric, near-surface and subsurface levels for integration into an intelligent monitoring system.
- *Focus Area for Carbon Sequestration Science* – \$7.0 million R&D activities that include Reservoir and Seal Performance; Geologic Storage Optimization and Operations; Storage Capacity and Efficiencies; Integrated Modeling and Monitoring Technologies; Resource Assessments and Geospatial Resources; and CO₂ Use, Re-Use and Conversion.

Advanced Energy Systems (AES). The President's FY 2015 budget requests \$51.0 million for advanced energy systems R&D. The AES mission is to increase the availability and efficiency of fossil energy systems integrated with CO₂ capture, while maintaining the highest environmental standards at the lowest cost. The program elements focus on gasification, oxy-combustion, advanced turbines, and other energy systems.

In FY 2015, the decreased funding enables the program to continue the development, through design and construction, of pressurized oxy-combustion and chemical looping combustion pilot-scale systems; continue development of materials engineering design for hydrogen turbines; continue advanced gasification technology component development such as oxygen membranes, warm gas cleanup and hydrogen separation at bench through pilot-scale; and continue the Solid Oxide Fuel Cell (SOFC) Program to focus on durable SOFC materials.

The FY 2015 request includes funding for:

- *Advanced Combustion Systems* – \$15.0 million for the development of advanced combustion technologies, such as pressurized oxy-combustion and chemical looping processes.
- *Gasification Systems* – \$22.0 million to continue to support the development of advanced oxygen production, dry feed technologies for low rank coal use, warm-gas cleanup, and hydrogen separation.
- *Hydrogen Turbines* – \$11.0 million for the development of key turbine system components capable of achieving a four percentage point efficiency increase relative to existing combined cycle turbines.
- *Solid Oxide Fuel Cells* – \$3.0 million reflects the narrowed focus of the program to materials research.

Cross-cutting Research. The President's FY 2015 budget requests \$35.3 million for crosscutting research. The Program serves as a bridge between basic and applied research by targeting concepts that offer the potential for transformational breakthroughs and step change benefits in the way energy systems are designed, constructed, and operated. In addition, the

Cross-cutting Research Program leads efforts that support University-based energy research including science and engineering education at minority colleges and universities.

The FY 2015 request increases the amount for Coal Utilization Science, including Computational System Dynamics and the Focus Area for Computational Energy Science. This funding level will support the Carbon Capture Simulation Initiative to facilitate more rapid development and commercialization of capture technologies, and the National Risk Assessment Project, to quantify and understand the risks from carbon storage. It also includes Grid Tech to enable fossil-based facilities to better integrate with advanced grid technologies (i.e., smart grid).

The President's FY 2015 request includes:

- *Plant Optimization Technology* – \$7.04 million for sensors and controls;
- *Coal Utilization Science* – \$23.6 million for computation systems dynamics and computational energy science;
- *Energy Analyses* – \$0.85 million for environmental activities and technical and economic analysis;
- *University Training and Research* – \$2.75 million for university coal research, historically black colleges and universities education and training; and
- *International Activities* – \$1.1 million to support FE's commitment to the International Energy Agency Clean Coal Center (IEACCC) to enhance the competitiveness and adoption of U.S. Clean Coal Technologies in targeted countries that will help protect the local and global environment. It will also preserve and enhance active relationships with national and international organizations by focusing on expanding cleaner energy technology power systems activities globally.

Natural Gas Technologies. The mission of the Natural Gas program – with a FY 2015 budget request of \$35.0 million – is to support DOE missions in energy, environment and national security. The Natural Gas Technologies program will focus on developing technologies to mitigate air and water impacts and reduce the surface and subsurface footprint to enable safe and responsible development of unconventional domestic natural gas resources.

The FY 2015 request includes \$15.3 million to implement priority collaborative research and development with the Environmental Protection Agency and Department of the Interior to ensure that shale gas development is conducted in a manner that is environmentally sound and protective of human health and safety. The program will focus on research in such areas as water quality, water availability, air quality, induced seismicity, and mitigating the impacts of development (e.g. wellbore integrity, improve environmental footprint, and reduce water use). This research includes advancements in technology, methodology, risk assessment, and mitigation consistent with this multiagency effort.

The FY 2015 request also includes \$4.7 million to fund a new midstream natural gas infrastructure program focused on advanced cost-effective technologies to detect and mitigate

methane emissions from natural gas transmission, distribution, and storage facilities and to communicate results on methane emissions mitigation to stakeholders.

In addition, the request includes \$15 million to conduct lab- and field-based research focused on increasing public understanding of methane dynamics in gas-hydrates bearing areas. These public sector-led efforts will be designed to evaluate the occurrence, nature and behavior of naturally occurring gas hydrates and resulting resource, hazard, and environmental implications.

Petroleum Reserves

FE's Office of Petroleum Reserves manages programs that provide the United States with strategic and economic protection against disruptions in oil supplies.

Strategic Petroleum Reserve. The Strategic Petroleum Reserve protects the U.S. from disruptions in critical petroleum supplies and meet the emergency oil stock holding obligations under the International Energy Agency (IEA). The current 696 million barrel reserve provided 112 days of net oil import protection in 2013. The most recent drawdown of the SPR was 30 million barrels in FY 2011 as the U.S. obligation under the IEA Libya Collective Action.

The FY 2015 budget request for the Strategic Petroleum Reserve is \$205 million. The funding increase includes support for a larger Major Maintenance program required to reduce the backlog of deferred maintenance projects. The program will continue the degasification of crude oil inventory to ensure its availability; testing and cavern remediation; a cavern maintenance program to slow the loss of cavern storage capacity; and repair the crude oil tank at Bryan Mound that will restore the program's maximum drawdown rate.

Northeast Home Heating Oil Reserve. The Northeast Home Heating Oil Reserve (NEHHOR) provides a short-term supplement to the Northeast systems' commercial supply of heating oil in the event of a supply interruption. In FY 2011, the NEHHOR Program completed the sale of all 2 million barrels of its high sulfur heating oil inventory located in commercial storage. In FY 2012, NEHHOR converted to a 1 million barrel configuration of Ultra Low Sulfur Diesel (ULSD) stored in the Northeast terminals, to meet new Northeast states' emission standards being instituted. The FY 2014 program will continue operation of the 1 million barrel Reserve of ULSD in Groton, CT, and Revere, MA. The FY 2015 budget request of \$1.6 million for continuing storage of the 1 million barrels assumes use of \$6 million in prior year balances to meet projected requirements, which includes the re-solicitation of both terminal contracts at market rates.

Naval Petroleum and Oil Shale Reserves. The FY 2015 budget requests \$19.95 million for the Naval Petroleum and Oil Shale Reserves (NPOSR). The NPOSR program manages a number of legal agreements that were executed as part of the 1998 sale of NPR-1 in California. These agreements direct post-sale work including environmental restoration and remediation, contract closeout, and records disposition. The NPR-1 program continues to work towards closing out the remaining environmental findings, as required by the 2008

agreement between DOE and the California Department of Toxic Substance Control. DOE also operates NPR-3 and RMOTC, co-located near Casper, Wyoming. NPR-3/RMOTC will implement the approved disposition plan with final disposition of the property estimated to occur by December 2015.

Elk Hills School Land Fund. The Elk Hills School Lands Fund, subject to appropriation, provides a source of compensation for the California State Teachers' Retirement System as a result of a settlement with the State of California with respect to its longstanding claim to title of two sections of land within NPR-1. In 2011, the Department and the State of California agreed on the final, last payment of \$15.6 million. Funding for this payment is requested in the FY 2015 budget.

Conclusion

The Office of Fossil Energy is committed to developing the science and technology that will allow the Nation to use its abundant fossil energy resources in a way that balances the energy needs for sustaining a robust economy with environmental responsibility. The FY 2015 budget request will help maintain DOE's leadership role in addressing issues of energy and environmental security. We believe this budget will provide the resources needed to achieve these goals while ensuring maximum benefit to U.S. taxpayers.

Mr. Chairman, and members of the Committee, this completes my prepared statement. I would be happy to answer any questions you may have at this time.