

**Statement by Charles D. McConnell
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U.S. Department of Energy**

**FY 2013 Appropriations Hearing
House Committee on Appropriations
Subcommittee on Energy and Water Development**

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Mr. Chairman, Members of the Committee, it is my pleasure to appear before you today to present the Office of Fossil Energy's (FE) proposed Budget for Fiscal Year 2013.

The Office of Fossil Energy's primary objective is to ensure that we can continue to utilize our traditional fuel sources for clean, affordable, reliable energy. Fossil fuels, which provide 83 percent of U.S. energy consumption, are expected to continue to play a critical role in meeting our Nation's energy needs for the foreseeable future. To help meet this demand, the Office of Fossil Energy Research and Development (FER&D) program 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.

To that end, the program's mission is to create technology and technology-based policy options that enhance U.S. economic, environmental and energy security. This mission is achieved by developing technologies to enable the environmentally responsible use of domestic fossil fuels with the goal of achieving near-zero atmospheric emissions power production, including a specific focus on dramatic reductions of global carbon emissions at acceptable cost. FER&D will also address concerns associated with the environmental, health, and safety risks of shale gas development.

The bulk of FE's current R&D program activities focus on: 1) carbon dioxide (CO₂) capture technology applicable to both new and existing fossil-fueled facilities; 2) CO₂ storage, CO₂ measuring, monitoring, verification and accounting; 3) advanced coal-fueled power systems that support carbon capture and storage (CCS) and CO₂ utilization, including integrated gasification combined cycle (IGCC) and oxy-combustion technologies; and 4) cross-cutting research to bridge fundamental science and engineering development.

Currently, we are pursuing the integrated demonstration of first generation CCS technologies with existing and new power plants and industrial facilities. These demonstrations are focused on using a range of capture technologies and storing CO₂ in a variety of geologic formations, including enhanced oil recovery (EOR). While EOR is a known production method that has been in commercial use for decades, it catalyzes the demonstration of CCS technology in some cases, and thereby helps in the areas of research that need the most attention, Carbon Capture and Measuring, Monitoring and Verification (MMV), as well as to leverage more private funding to support those public benefit goals. There are currently six major CO₂ EOR demonstration projects underway across the U.S. As with other projects employing geological

storage, CO₂ EOR projects will be subject to rigorous monitoring, verification and accounting procedures and technologies to ensure their safety and effectiveness.

Our program is only supporting economic utilization of captured CO₂ to the extent that it results in permanent sequestration of CO₂ that would otherwise be released into the atmosphere. It will consist primarily of reducing the cost of carbon capture, or storage monitoring and verification activities: measuring the quantity of CO₂ that is injected and not subsequently recovered in the oil production process and then verifying that the CO₂ left in the ground is permanently and safely sequestered and not eventually re-released into the atmosphere through fractures, abandoned wells, or other processes. In addition to the environmental benefits noted, this program will also increase domestic oil production, create jobs, and improve the Nation's domestic energy security.

In addition to EOR, we are exploring other pathways and novel approaches to beneficially utilize captured CO₂, such as the conversion of CO₂ to useable products and fuels, again with the overarching objective of assuring permanent sequestration of CO₂ that would otherwise be released into the atmosphere. To date, the program has focused on the most valuable products with the largest potential markets (other than EOR), including production of chemicals, building materials, and curing for cement.

FE's current portfolio of funded projects is on course to meet the goal to commence, by 2016, the operation of four to six CCS demonstration projects from the suite of coal power plants and other large-scale facilities through the Clean Coal Power Initiative (CCPI), FutureGen 2.0, and Industrial Carbon Capture and Storage (ICCS) programs. In parallel to demonstration of first generation CCS technologies, we are conducting and supporting long-term, high-risk R&D to significantly reduce coal power plant emissions (including CO₂). This R&D is exploring ways to substantially improve efficiency to reduce carbon emissions, leading to a viable near-zero atmospheric emissions coal energy system and supporting carbon capture and storage.

The Office of Oil and Natural Gas Technologies oversees the prudent and sustainable use of federal funds to develop our natural gas resources. The FY 2013 budget request will redirect natural gas R&D within FER&D to support a coordinated, interagency effort by DOE, the Environmental Protection Agency (EPA) and the U.S. Geological Survey (USGS) to conduct research and development aimed at understanding and reducing the environmental, health, and safety risks of natural gas and oil production through hydraulic fracturing. The program also is studying hydrates in the Arctic via controlled *in situ* depressurization and CO₂ injection. The program recently drilled a fully instrumented hydrate well in Alaska at a cost of \$8 million. Leveraging funding from Japan (up to \$7 million) and \$5 million from the FY 2011 Basic Energy Science budget (in DOE's Office of Science), the testing of this well will take place in 2012 and be completed in FY 2013.

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 energy and economic 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 emergency oil stocks. In June 2011, the SPR sold 30.6 million barrels of oil to meet U.S. obligations under the IEA's Libya Collective Action.

The FY 2013 budget provides for the continued operations and readiness of the SPR to meet its critical mission of protecting the Nation against potential disruptions in U.S. oil supplies. In FY 2013, the SPR will initiate plans to repurchase oil sold in 2011 using the proceeds from that sale.

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 2013 Budget Request

President Obama's FY 2013 budget requests \$650.8 million for the Office of Fossil Energy (FE) to support improved energy security and rapid development of climate-oriented technology. The request includes \$420.6 million for Fossil Energy Research and Development, \$195.6 million for the Strategic Petroleum Reserve, \$10.1 million for the Northeast Home Heating Oil Reserve (and includes a \$6 million rescission of prior year funds), \$14.9 million for the Naval Petroleum Reserves and \$15.6 million for the Elk Hills School Lands Fund.

Fossil Energy Research and Development

The President's FY 2013 budget requests \$420.6 million for FER&D, with a strong focus on advancing carbon capture, utilization and storage technologies. This effort supports the recommendations of President Obama's Interagency Task Force on Carbon Capture and Storage, as well as DOE's overall mission to achieve national energy security in an economic and environmentally sound manner by developing the technical capability to dramatically reduce carbon emissions to achieve near-zero atmospheric emissions power production.

To achieve this goal, the program is focused on developing and demonstrating advanced power generation and carbon capture, utilization and storage technologies for existing facilities and new fossil-fueled power plants by increasing overall system efficiencies and reducing capital costs. The near-term focus is on developing advanced technologies that increase the power generation efficiency for new plants and technologies to capture CO₂ from new and existing industrial and power-producing plants. In the longer term, the goal is to increase energy plant efficiencies and reduce both the energy and capital costs of CO₂ capture, utilization and storage from new, advanced coal plants and existing plants. These activities will help allow coal to remain a strategic fuel for the Nation while enhancing environmental protection.

The CCS Demonstrations program, including the Clean Coal Power Initiative, FutureGen 2.0, and Industrial CCS Demonstrations, enables and accelerates the deployment of advanced carbon capture, utilization and storage technologies to ensure clean, reliable,

and affordable electricity for the United States. The 2013 budget request does not provide any demonstration funds because these projects are already strongly supported through the 2009 American Recovery and Reinvestment Act (ARRA). The ARRA provided \$3.4 billion for CCS.

CCS and Power Systems R&D

The CCS and Power Systems R&D FY 2013 budget request of \$275.9 million represents just over 40 percent of FE's total FY 2013 budget request. The program directly supports the mission of FER&D by providing research to significantly reduce coal power plant emissions (including CO₂) and substantially improve efficiency to reduce carbon emissions, leading to a viable near-zero atmospheric emissions coal energy system and supporting carbon capture, utilization and storage. The FY 2013 request includes \$35 million for NETL staff to conduct in-house coal R&D.

Coal activities include research, development and demonstration of technologies that will improve the competitiveness of near-zero emissions coal-fueled electricity generation in future energy supply markets through technologies that cost-effectively capture, utilize, and store CO₂, providing a domestic, low-cost, low-CO₂ energy supply option.

In FY 2013 and through the Recovery Act, the Coal program continues aggressive funding for carbon capture, utilization and storage activities. These activities include large-scale demonstration of injection and storage in geologic formations or beneficial utilization of CO₂ through the Regional Carbon Sequestration Partnerships, as well as large-scale demonstration of carbon capture technologies through the Clean Coal Power Initiative and Industrial CCS activity.

Carbon Capture. The President's budget requests \$60.4 million for DOE's Carbon Capture program. This sub-program is focused on the development of post-combustion and pre-combustion CO₂ capture technologies for new and existing power plants as well as industrial sources. Post-combustion CO₂ capture technology is applicable to pulverized coal (PC) power plants, which is the current standard industry technology for coal-fueled electricity generation. Pre-combustion CO₂ capture is applicable to gasification-based systems such as IGCC, a potential technology for future generation of electricity from coal-fueled plants. Industrial sources may provide unique challenges to CO₂ capture at these facilities. The decrease in funding for post-combustion R&D reflects a level sufficient to maintain focus on the current scope of activities, while the decrease in funding for pre-combustion capture systems represents program prioritization on post-combustion capture technology development.

Carbon Storage. The FY 2013 budget requests \$95.5 million for Carbon Storage R&D. The activities conducted under this sub-program will be used to benefit the existing and future fleet of fossil fuel power generating facilities by reducing the cost-of-electricity impacts and providing protocols for CCS demonstrations as they are designed to capture, transport, store, and monitor the CO₂ injected in geologic formations. No funding is provided for reforestation or other terrestrial carbon sequestration.

The request includes \$67 million for Regional Carbon Sequestration Partnerships, which are an essential component of the carbon storage program, unite more than 400 public and private entities in an effort to complete and evaluate CO₂ injection tests across the nation. Funding for other geological storage activities, including small and large-scale field tests in other geologic storage classes, gives priority to near-term research areas to meet goals for safe, permanent storage of CO₂.

In FY 2013, projects will focus on the development of innovative, advanced technology and protocols for the monitoring, verification, accounting, and assessment of CO₂ storage in geologic formations as well as simulating the behavior of geologically-stored CO₂. This activity will culminate in a set of best practices for the deployment of carbon capture, utilization and storage technology.

Advanced Energy Systems. The President's Budget requests \$55.2 million for Advanced Energy Systems research. This activity is focused on reducing the cost of gasification and enabling affordable CO₂ capture, while increasing plant availability and efficiency, and maintaining the highest environmental standards. The program supports gasification-related R&D to convert coal into ultra-clean synthesis gas (syngas) that can, in turn, be converted into chemicals, hydrogen, liquid fuels and electricity.

The President's FY 2013 budget reflects a shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants. Consequently, DOE reduces funding for Advanced Combustion Systems R&D, Gasification Systems R&D, and hydrogen turbines.

Cross-Cutting Research. The FY 2013 budget requests \$29.8 million for Cross-Cutting Research. This sub-program serves as a crosscutting bridge between basic and applied research. It fosters the development and deployment of innovative systems for improving efficiency and environmental performance through the research and development of instrumentation, sensors and controls targeted at enhancing the availability of advanced power systems while reducing costs of Advanced CCS and Power Systems. This program area develops computation, simulation and modeling tools focused on optimizing plant design and shortening developmental timelines. It also addresses advanced and cross-cutting issues, including plant optimization technologies, environmental and technical/economic analyses, coal technology export, and integrated program support.

As with the request for Advanced Energy Systems, the request for Cross-Cutting Research represents the shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants. The funding request is broken down as follows:

- **Plant Optimization Technology** -- \$7 million for sensors and controls;
- **Coal Utilization Science** -- \$17.2 million for computation systems dynamics and computational energy science;
- **Energy Analyses** -- \$0.95 million for environmental activities and technical and economic analysis;

- **University Training and Research** -- \$3.25 million for university coal research, historically black colleges and universities education and training; and
- **International Activities** -- \$1.35 million for multilateral collaboration with organizations such as the International Energy Agency, the United Nations, the World Energy Council, and the Carbon Sequestration Leadership Forum, as well as bilateral activity with key countries such as China and India.

Natural Gas Technologies R&D

The President's budget requests \$17 million for Natural Gas Technologies program, which is being reprioritized to launch a collaborative research and development initiative together with the Environmental Protection Agency and the Department of the Interior's U.S. Geological Survey to understand and minimize the potential environmental, health, and safety impacts of natural gas development through hydraulic fracturing, consistent with the recommendations of the Secretary of Energy Advisory Board's (SEAB) August 2011 "Shale Gas Production Subcommittee Ninety-Day Report." \$12 million of the requested funding will center on continued implementation of the priority collaborative R&D initiative with EPA and USGS. The Department has been engaged with EPA and the USGS to determine top priority research projects, divide work responsibilities, and continue collaboration to share data and planning.

Petroleum Reserves

The Office of Petroleum Reserves manages the Strategic Petroleum Reserve, which provides strategic and economic protection to the Nation from disruptions in foreign and domestic petroleum supplies; the Northeast Home Heating Oil Reserve, and the Naval Petroleum and Oil Shale Reserves, involving the Department's environmental legacy responsibilities from the sale of the Naval Petroleum Reserve No. 1 (NPR-1) in California and the operation of the NPR-3 stripper oil field and Rocky Mountain Oilfield Testing Center, both located near Casper, Wyoming.

Strategic Petroleum Reserve. The FY 2013 budget request of \$195.6 million provides for the management, operations and security of the four SPR storage facilities with a combined capacity of 727 million barrels. It will also allow the relocation of the degasification plant to maintain SPR crude oil stocks at safe vapor pressure levels, cavern casing inspections and remediation as required to comply with state regulations and to assure storage integrity. The FY 2013 increase of \$2.9 million reflects the moving of the degasification plant from the Bryan Mound site to the West Hackberry site; a capacity maintenance program; enabling SPR to regain the cavern volume lost to geologically induced cavern creep and an increased cavern remediation program. The increase is offset by no additional funding required for the Bayou Choctaw cavern replacement project and a reduction in security and power costs.

SPR receipts from the June 2011 sale totaled \$3.24 billion and were deposited into the SPR Petroleum Account for the acquisition, transportation, and injection of replacement stocks. The FY 2012 Energy and Water Development Appropriations Act rescinded \$500 million of the balances from the June 2011 emergency sale within the SPR Petroleum Account. The FY

2013 budget proposes to permanently cancel an additional \$291 million of the balances from the sale from the SPR Petroleum Account.

Northeast Home Heating Oil Reserve. The Northeast Home Heating Oil Reserve was established in 2000 to provide an emergency stockpile of home heating oil to address the Northeast's vulnerability to winter weather shortages. The Reserve provides a buffer for the Northeast against a supply disruption for approximately 10 days, the time required for ships to carry heating oil from the Gulf of Mexico to New York Harbor.

In FY 2011, the Northeast Home Heating Oil Reserve sold its 2 million barrels of high sulfur heating oil for conversion to ultra-low sulfur diesel (ULSD). The Heating Oil Reserve was concurrently reduced from 2 million to 1 million barrels. The 2012 Energy and Water Development Appropriations Act cancelled net sale receipts in excess of the cost to purchase 1 million barrels of ULSD and other related costs. The FY 2013 budget request provides for the storage and operation of a 1 million barrel reserve in the New England, with 500,000 barrels stored in Revere, MA and 500,000 barrels in Groton, CT. The FY 2013 budget request of \$10.1 million continues operation of the Reserve, including the extension of the lease of commercial storage space. The request also includes a rescission of \$6 million in prior year funds.

Naval Petroleum and Oil Shale Reserves. The FY 2013 budget request for the Naval Petroleum and Oil Shale Reserve program is \$14.9 million. Three of the four original Naval Petroleum Reserves (NPR-1, NPR-2, and NPR-4) have been sold or transferred to the Department of the Interior. The NPR-1 oil field was sold in 1997 with residual requirements for equity finalization and environmental remediation. The Department continues to work on the cleanup and closure of its NPR-1 environmental remediation responsibilities. The Teapot Dome field (NPR-3) in Casper, Wyo., is the only remaining oil reserve managed by the DOE. NPR-3 is now a stripper field that also serves as an oilfield technology testing center (Rocky Mountain Oilfield Testing Center).

In April 2011, the Department reached a final equity settlement with Chevron for \$108 million. As a result of that settlement, the Department is required under a State of California "Settlement Agreement" to compensate the California State Teachers' Retirement System for its longstanding claim to title of two sections of land within NPR-1. On August 3, 2011, the Department and the State of California agreed to a final payment of \$15.6 million for the Elk Hills School Lands Fund. The President's budget requests \$15.6 million in FY 2013 for the Elk Hills School Lands Fund.

In 2013, Fossil Energy plans to initiate a sale/disposition plan for the NPR-3 oil field, with final disposition of the property estimated to occur in FY 2015. NPR-3 will be utilized for production and testing operations in order to retain asset value during preparation to transfer to potential new ownership. Production facilities will remain operational as long as they remain economically feasible. The program will continue Rocky Mountain Oilfield Testing Center (RMOTC) testing for 100 percent funds-in projects and those projects wholly funded by DOE's Energy Efficiency and Renewable Energy's Geothermal Technology Program.

Environmental remediation of NPR-3 facilities will continue to facilitate the sale/disposition of the property in a manner consistent with an approved property sale/disposition plan.

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 2013 budget request will help maintain DOE's leadership role in addressing issues of energy and environmental security.

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.