COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

HEARING CHARTER

New Directions for Energy Research and Development at the U.S. Department of Energy

Tuesday, March 17, 2009
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

PURPOSE

On Tuesday, March 17, 2009, the Committee on Science and Technology will hold a hearing entitled ***"New Directions for Energy Research and Development at the U.S. Department of Energy."*** The purpose of the hearing is to receive testimony on the Administration's near-term objectives and priority issues for the research and development (R&D) activities under the Offices of Science, Energy Efficiency and Renewable Energy, Fossil Energy, Nuclear Energy, Electricity Delivery and Energy Reliability, and the Loan Guarantee Program. The discussion will also focus on the Department's plans for spending the funds allocated under both the American Recovery and Reinvestment Act of 2009 and the Fiscal Year 2009 Omnibus Appropriations Act. Finally, Secretary Chu will address some features of the Department's organization that impede scientific innovation and the remedies being considered to address them.

WITNESS

- **Dr. Steven Chu,** *U.S. Secretary of Energy*. Prior to his appointment as the 12th Secretary of Energy, Dr. Chu was the Director of DOE's Lawrence Berkeley National Laboratory, and a professor of Physics and Molecular and Cell Biology at the University of California. In 1997 he was the co-winner of the Nobel Prize for Physics.

BACKGROUND

The FY 2010 Budget Request to Congress

As has been typical of presidential transitions in recent history President Obama chose to delay submission of a detailed FY 2010 Budget Request and instead released a summary document that provides an overview of the President's budget proposals. The 3-page excerpt for the Department of Energy is attached. Detailed budget documents will be transmitted to Congress in April.

The budget document proposes $26.3 billion for the Department of Energy in FY 2010. In recent years the civilian energy R&D programs have made up approximately one-third of the

total DOE budget, with other programs related to nuclear weapons and environmental clean-up comprising the rest. Of particular note in this budget is the President's commitment to double overall federal funding for basic sciences, with significant increases expected for the DOE Office of Science. The FY 2009 Omnibus Appropriations bill currently allocates $4.8 billion for Office of Science, and the American Recovery and Reinvestment Act included $1.6 billion.

Other Administration priorities listed in the proposal include encouraging commercialization of innovative energy technologies through the Loan Guarantee Program, developing advanced coal technologies such as carbon capture and sequestration, modernizing the nation's electric transmission infrastructure through smart grid and storage technologies, and promoting the research, development, demonstration and deployment of clean energy technologies.

The budget request is also expected to increase support for promising, but exploratory and high-risk research activities with potential to deliver radically new technologies, such as those proposed to be carried out by the new Advanced Research Projects Agency for Energy (ARPA-E). Modeled on a similar program in the Defense Department, ARPA-E was authorized in the America COMPETES Act of 2007 to be a small and nimble organization that conducts such high-risk, high-reward energy technology R&D through collaborations between government, academia and industry. Together the FY 2009 Omnibus and the Recovery Act provide $415 million for start-up and initial operations of ARPA-E.

The American Recovery and Reinvestment Act of 2009

The American Recovery and Reinvestment Act allocated approximately $39 billion to DOE. The bulk of this is dedicated to making the country more efficient through activities such as weatherization of low-income homes, retrofitting federal facilities, and implementation of state and local efficiency programs. In addition to the funds mentioned above for the Office of Science and ARPA-E, a significant amount was provided for next generation energy technologies through DOE's applied energy R&D programs.

Of the funds allocated for the Office of Energy Efficiency and Renewable Energy (EERE), the Recovery Act specified $2.5 billion for R&D. Of that amount, $800 million is directed to biomass, $400 million to geothermal, and the remainder is to be directed amongst the other R&D programs including: wind, solar, hydrogen, vehicle technologies, industrial technologies, and energy efficiency. An additional $2 billion is directed to grants for advanced battery manufacturing.

The Office of Electricity Delivery and Energy Reliability (OE or EDER) receives approximately $4.5 billion to modernize the electric transmission infrastructure through deployment of smart grid and energy storage technologies. The Office of Fossil Energy is allocated $3.4 billion for the development of technologies to capture and sequester carbon dioxide. Finally, the Innovative Technology Loan Guarantee Program authorized in EPAct 2005 receives $6 billion, most of which is to be devoted to rapid deployment of proven clean energy technologies.

The Recovery Act represents an unprecedented one-time increase in funding for DOE. Effective use of Recovery Act funding requires DOE to transfer the funds to the appropriate government and private sector entities in a timely manner and with an appropriate level of transparency and accountability. The Inspector General's office at DOE and the Government Accountability Office are allocated additional funds in the Recovery Act to provide additional oversight of these expenditures.

Organizational Challenges at the Department of Energy

The priorities and mission of the Department of Energy have shifted over time. Roughly two-thirds of the Department's budget is still devoted to the production and maintenance of the nation's nuclear weapons stockpile and clean-up of the environmental legacy of weapons production dating from its history with the Manhattan Project and its parent organization, the Atomic Energy Commission. The remaining third of the budget is devoted to a wide array of basic and applied energy research and development activities that are managed currently by two Under Secretaries, four Assistant Secretaries, and two Directors. It has been argued that DOE's stove-piped organization and management of its laboratory system have led to operational inefficiencies and poor coordination across the Departments research programs. A number of solutions have been proposed over the years to streamline operations and ensure transparency and accountability while fostering innovation.

One proposal is to place all civilian R&D programs under the authority of the Under Secretary for Science for the purpose of improving coordination and management of DOE's energy research, development, and demonstration programs. Currently, one Under Secretary is responsible for applied energy R&D as well as Environmental Management, Legacy Management, and Civilian Radioactive Waste Management. The Under Secretary for Science is responsible for basic research activities conducted by the Office of Science. The current division of authority over these programs does not facilitate development of a comprehensive, consistent strategy for translating basic research discoveries into technological applications. Realignment would allow one Under Secretary to focus on all energy research and technology development programs, while the other focuses on important environmental stewardship programs.

Another proposal involves using external agencies to regulate DOE's laboratories. DOE is unique in maintaining a large internal bureaucracy to regulate its own environmental, safety, and health performance. Applying external regulatory oversight to DOE's laboratories would reduce costs and remove inherent conflicts of interest by transferring DOE's worker safety compliance role to the Occupational Safety and Health Administration (OSHA) and the nuclear safety compliance role to the Nuclear Regulatory Commission (NRC).

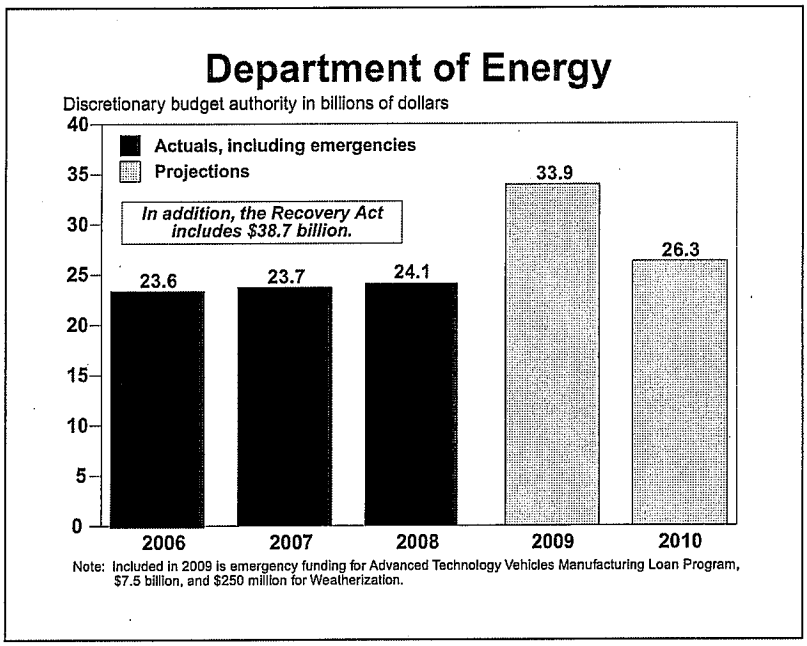
DEPARTMENT OF ENERGY

Funding Highlights:

- Begins to build a new economy that is powered by clean and secure energy through funding provided in the 2010 Budget and the $39 billion provided for energy programs in the American Recovery and Reinvestment Act of 2009.
- Provides significant increases in funding for basic research and world-leading scientific user facilities to support transformational discoveries and accelerate solutions to our Nation's most pressing problems – including the development of clean energy.
- Supports economic investment and positions the United States as the world leader in climate change technology.
- Accelerates the transition to a low-carbon economy through increased support of the development and deployment of clean energy technologies such as solar, biomass, geothermal, wind, and low-carbon emission coal power.
- Builds on the $11 billion provided in the Recovery Act for smart grid technologies, transmission system expansion and upgrades, and other investments to modernize and enhance the electric transmission infrastructure to improve energy efficiency and reliability.
- Supports and encourages the early commercial deployment of innovative, clean energy technologies through loan guarantees.
- Reduces security risks through the detection, elimination, and securing of nuclear material and radiological sources worldwide while maintaining the safety, security, and reliability of the nuclear weapons stockpile.
- Continues the Nation's efforts to reduce environmental risks and safely manage nuclear materials.

Invests in the Sciences. As part of the President's plan to double Federal investment in the basic sciences, the 2010 Budget, along with the $1.6 billion provided in the Recovery Act for the Department of Energy's basic science programs, provides substantially increased support for the Office of Science. The Budget increases funding for improving our understanding of climate science and continues the United States' commitment to international science and energy experiments. The Budget also expands graduate fellowship programs that will train students in critical energy-related fields.

Encourages the Early Commercial Use of New, Innovative Energy Technologies that Will Reduce Greenhouse Gas Emissions. The Budget supports loan guarantees for inno-



vative energy technologies including renewable energy projects, transmission projects, and carbon sequestration projects that avoid, reduce, or sequester air pollutants and greenhouse gases while simultaneously creating green jobs and contributing to long-term economic growth and international competitiveness.

Advances the Development of Low-Carbon Coal Technologies. The Budget supports Carbon Capture and Storage technology, and along with the $3.4 billion provided in the Recovery Act for low-carbon emission coal power and industrial projects, these funds will help allow the use of our extensive domestic coal resource while reducing the impacts on climate change.

Invests in Smart, Energy Efficient, Reliable Electricity Delivery Infrastructures. The Budget provides support for the Office of Electricity Delivery and Energy Reliability as part of the President's investment plan to modernize the Nation's electric grid. It includes: energy storage; cyber-security and investments in research, the development and demonstration of smart grid technologies that will accelerate the transformation of the Nation's energy transmission and distribution system; enhancement of security and reliability of energy infrastructure; and facilitating recovery from disruptions to the energy supply.

Invests in Clean Energy Technologies to Reduce Dependence on Foreign Oil and Accelerate the Transition to a Low-Carbon Economy. The Budget provides support for accelerating research, development, demonstration, deployment, and commercialization of clean energy technologies, including biofuels, renewable energy, and energy efficiency projects. These investments will reduce dependence on foreign oil and create long-term, sustainable economic growth in the green industries of the future.

Reduces Proliferation Risks and Ensures the Safety, Security, and Reliability of the Nuclear Weapons Stockpile Without Nuclear Testing. The Budget supports increased efforts to secure and dispose of nuclear material and invests in innovative science and technology to detect and deter nuclear smuggling and the development of weapons of mass destruction programs. Development work on the Reliable Replacement Warhead will cease, while continued work to improve the nuclear stockpile's safety, security, and reliability is enhanced with more expansive life extension programs.

Focuses on the Cleanup and Management of Radioactive Waste and Nuclear Materials. The Budget focuses on improved performance and accountability for the environmental legacy of the Nation's nuclear weapons program by addressing health and safety risks across the country. The Yucca Mountain program will be scaled back to those costs necessary to answer inquiries from the Nuclear Regulatory Commission, while the Administration devises a new strategy toward nuclear waste disposal.