

## FY 2012 Appropriations for Science programs within the Department of Energy

### DOE Office of Science FY 2012 Request

(numbers are in millions)

DOE	FY 2011 Final	FY 2012 Request	House Mark	Senate Mark	Final	% change from FY11
<b>Office of Science:</b>						
<b>Biological &amp; Environmental Research</b>	<b>611.8</b>	<b>717.9</b>	<b>547.1</b>	<b>621.8</b>	<b>611.8</b>	<b>flat</b>
Climate & Environmental Sciences	N/A	341.6				
Atmospheric System Research	N/A	26.4				
Environmental System Science	N/A	101.2				
Terrestrial Ecosystem Science	N/A	50.0				
Terrestrial Carbon Sequestration Research	N/A	1.0				
Subsurface Biogeochemical Research	N/A	50.2				
Climate & Earth System Modeling	N/A	77.3				
Regional & Global Climate Modeling	N/A	29.1				
Earth System Modeling	N/A	36.6				
Integrated Assessment	N/A	11.7				
Climate & Environmental Facilities & Infrastructure	N/A	128.2				
ARM Climate Research Facility	N/A	68.0				
<b>Advanced Sci. Computing Research</b>	<b>421.9</b>	<b>465.6</b>	<b>427.1</b>	<b>441.6</b>	<b>442.0</b>	<b>5.0%</b>
<b>Total, Office of Science</b>	<b>4,842.6</b>	<b>5,416.1</b>	<b>4,800.00</b>	<b>4,842.6</b>	<b>4,889.0</b>	<b>1.0%</b>

### December 16, 2011 – Final Energy and Water FY12 Appropriations

The final version of the fiscal year (FY) 2012 Energy and Water Development Appropriations bill totals \$32.1 billion, an increase of \$2,291.1 million above the FY 2011 enacted level for programs and agencies funded in the bill. Of this amount, \$25.75 billion is for programs at the Department of

Energy (DOE). The recommendations in this bill are affected by the “firewalls” between security and non-security spending with DOE’s National Nuclear Security Administration (NNSA) part of the security allocation. The conferees approve one of the Administration’s major initiatives for DOE, providing funding for two new Energy Innovation Hubs (Hubs), bringing the total to five Hubs.

Given the competition for funding within the bill, the DOE Office of Science, which funds basic research associated with agency missions, fared quite well. The final bill provides \$4.889 billion for the DOE Office of Science, which is \$46.34 million (about one percent) above the FY 2011 enacted funding level, and above both the House-passed and Senate-reported levels.

The conferees also approve two new Energy Innovation Hubs of the three requested by the President. The final bill approves the new Batteries and Energy Storage Hub within the Office of Basic Energy Sciences, providing \$20 million for the new Hub. The final bill also includes the President’s request for \$20 million in the Industrial Technologies program within the Office of Energy Efficiency and Renewable Energy (EERE) to establish a new Critical Materials Hub.

Also within the \$1.69 billion provided for the Basic Energy Sciences (BES) program, the final bill includes \$10 million for the predictive modeling of internal combustion engines initiative; up to \$100 million to support the 46 existing Energy Frontier Research Centers (EFRCs); and \$8.52 million for the Experimental Program to Stimulate Competitive Research (EPSCoR). The final bill also includes up to \$5 million to fund existing graduate fellowships.

For the Biological and Environmental Research (BER) program, the final recommendation of \$611.8 million would provide flat funding relative to FY 2011. The bill restores funding for the overall program, whereas the House had proposed to significantly reduce climate and environmental science activities.

For the Advanced Scientific Computing Research (ASCR) program, a total of \$442 million is provided, which is an increase of \$20 million (five percent) above FY 2011. The conferees state their support for the exascale computing initiative, but note that future funding is contingent upon delivery of a joint program plan.

For the Advanced Research Projects Agency-Energy (ARPA-E), the bill would provide \$275 million to continue support for research into high-risk, high-reward transformational new energy technologies, an increase of \$95.4 million (53 percent) above the FY 2011 enacted funding level.

The applied research programs of DOE relating to renewable energy through Energy Efficiency and Renewable Energy (EERE) are funded at \$1.815 billion overall for FY 2012, a net increase of \$19.45 million following House action to significantly reduce spending for these programs. Details of the recommendations for wind and solar energy, biomass, and the technologies programs are included in the chart below. New initiatives, other than the new Critical Materials Hub within the Industrial Technologies program, are unlikely given the constraints under current budget allocations.

## **July 19, 2011 – House Passes FY 2011 Energy and Water Bill**

Despite the low likelihood that the House versions of the fiscal year (FY) 2012 appropriations bills will be enacted into law, on July 15, the full U.S. House of Representatives passed the Energy and Water Development Appropriations bill (H.R. 2354) by a vote of 219 to 196. The full House made very few changes to the bill approved by the Appropriations Committee, although many amendments were offered to either restore funding to various programs in the bill, or to significantly reduce spending in the bill and devote the savings to deficit reduction. Reflecting House Republicans' desire to reduce domestic discretionary spending, the House-passed bill is fully \$5.9 billion below President Obama's request and \$1 billion below the FY 2011 enacted level.

During House consideration of the bill, there was a concerted effort by members of the conservative Republican Study Committee (RSC) to reduce spending for the Department of Energy (DOE) and reserve the savings for deficit reduction. The House soundly defeated (95 to 313) an amendment by Rep. Tom McClintock (R-CA) to reduce the bill by \$3.25 billion through reductions in various DOE programs, including the Office of Science, the Advanced Research Projects Agency-Energy (ARPA-E), and various independent commissions. The House also overwhelmingly rejected (99 to 328) an amendment by Rep. Paul Broun (R-GA) to reduce the DOE Office of Science by \$820.5 million. Republican Members also unsuccessfully offered amendments to further reduce spending in the bill for the Energy Efficiency and Renewable Energy (EERE) programs of DOE, which are funded \$491 million (27 percent) below the FY 2011 level and \$1.9 billion (59 percent) below the President's FY 2012 request in the bill. An amendment by Rep. Broun to totally eliminate funding for EERE programs was rejected on a 69 to 354 vote.

Toward the end of the debate on the bill, Rep. Marsha Blackburn (R-TN) attempted to make deeper spending reductions by offering two amendments for across-the-board reductions to all programs funded in the bill. Her amendment to reduce all programs by 5 percent was rejected on a 129 to 272 vote. When that failed, Rep. Blackburn offered a 1 percent across-the-board reduction and that amendment failed on a 150 to 272 vote.

A series of amendments were conversely offered by House Democrats to restore funding to the bill. Rep. Rush Holt (D-NJ) offered an amendment to restore \$42.7 million to the DOE Office of Science to provide funding at the current FY 2011 level. Rep. Holt's amendment was defeated (164 to 261). Several amendments were offered by House Democrats to restore funding for the EERE programs with offsetting savings proposed from the nuclear weapons programs of DOE, fossil energy programs, and departmental administrative accounts. These amendments were defeated in much the same manner as Republican amendments to cut spending in the bill. An amendment by Rep. Adam Schiff (D-CA) to restore funding for ARPA-E to the FY 2011 enacted level of \$179.64 million passed by one vote (214 to 213). A more ambitious amendment by Rep. John Garamendi (D-CA) to provide an additional \$450 million for ARPA-E as requested by the President was defeated (145 to 276). ARPA-E supports high-risk, high-reward research and development leading to potentially game-changing new energy technologies and has been one of the few applied programs to see bipartisan support.

## **House Committee Recommendations**

Given the competition for funding within the bill, the DOE Office of Science, which funds basic research associated with agency missions, fared quite well. The House Committee would approve \$4.8 billion for the DOE Office of Science, a reduction of \$42.7 million (0.9 percent) below the FY 2011 enacted funding level. The Committee recommendation for the DOE Office of Science is \$616.1 million (11 percent) below the President's request.

Detailed funding recommendations for the various programs within the Office of Science are displayed in the chart below. The House bill would provide continuation funding for the three existing Energy Innovation Hubs (Hubs) – the Fuels from Sunlight Hub (\$24.3 million); the Energy Efficient Building Systems Design Hub (\$24.3 million); and the Nuclear Energy Modeling and Simulation Hub (\$24.3 million). The House bill would also approve funding for two new Hubs. Within the Office of Science, the President's request of \$24.3 million is approved to establish a new Batteries and Energy Storage Hub. The Committee also included \$20 million in the Industrial Technologies program within EERE to fund a new Critical Materials Hub. A third new Hub requested by the President for Advanced Modeling Grid Research is not funded, but the Appropriations Committee requested a report outlining these activities in both the Office of Electricity Delivery and Energy Reliability and ARPA-E.

The House bill would concur with the President's request to continue support for the 46 existing Energy Frontier Research Centers (EFRCs), but not to fund additional centers at this time.

The House Committee emphasized throughout the bill and within the Office of Science the need for better program management, including review and termination of underperforming projects. The Committee also signaled that initiatives that have been funded for five years should not necessarily be continued beyond the initial commitment of funding unless they are successfully meeting program requirements. The Committee used the three Bioenergy Research Centers, the Energy Innovation Hubs, and the EFRCs as examples. The Committee specifically pointed to the ARPA-E as a program structure in which projects are closely monitored and consideration is given to terminating programs that “fail to meet their challenging goals.”

The Basic Energy Sciences (BES) program was singled out for lack of transparency to the public and the Congress. The Committee directed the Department to create a “performance ranking” of all ongoing multi-year research projects within BES, including those at universities, national laboratories, Hubs, and EFRCs, and to terminate the lowest ranking projects in the amount of \$25 million. The Committee would provide \$1.69 billion for BES, an increase of \$9.95 million (0.6 percent) above FY 2011 but \$296.9 million (15 percent) below the President's request.

For the Biological and Environmental Research (BER) program, the House Committee recommendation of \$547.1 million is \$64.75 million (11 percent) below FY 2011 and \$170.8 million (24 percent) below the request. The Committee supported funding for the three Bioenergy Research Centers charged with developing cellulosic biofuels. It also indicated that the Climate and Environmental Sciences program is not focused on areas directly associated to the Department's core mandate on energy innovations. The Committee stated its expectation that such programs be assessed against core missions.

For the Advanced Scientific Computing Research (ASCR) program, a total of \$427.1 million would be provided, an increase of \$5.1 million (1 percent) above FY 2011 and \$38.5 million (8 percent) below the President's request. The House Committee acknowledged the importance of developing an exascale computing platform as crucial to maintaining U.S. leadership in high performance computing and information technology. The Committee encouraged the Department to continue efforts to have the Office of Science and the National Nuclear Security Administration (NNSA) collaborate and coordinate activities on exascale research. The Committee also directed the Department to provide a report outlining the plans for the exascale program, including a target date for an operational exascale platform, interim milestones to reach that goal, the estimated range of investment, and the details of the funding requested in the FY 2012 President's budget.

The Committee would provide increases above the FY 2011 level for Fusion Energy Sciences (8 percent), High Energy Physics (0.2 percent), and Nuclear Physics (2 percent). The Committee provided up to \$5 million to support the FY 2010 class of graduate fellows, but prohibits new fellowships and scholarships unless they were specified in the FY 2012 budget justification documents submitted to Congress.

The applied research programs of DOE relating to renewable energy are slated by the Committee for significant reductions below the FY 2011 enacted level and the President's budget request because significant stimulus funding is still available, and the private sector can be expected to invest in this energy research.

Within these programs, the Committee provided no funding for Solar Demonstration Zone projects; prohibited new funding opportunities in the Geothermal Technologies program due to the mortgages on past awards; prohibited conventional hydropower projects under the Water Power program; prohibited funding under the Vehicle Technologies program for electric vehicle charging stations but requested a National Academies study on the role, if any, the federal government should play in this area; continued the current SuperTruck Program; did not fund the Race to the Green Grant program or the Manufacturing Energy Systems initiative; and funded at \$10 million the Bright Tomorrow Lighting ("L") Prize initiative for which the Department has solicited funding proposals, but not requested funding.

The Committee emphasized that the DOE defense-related programs of the NNSA are a priority; however, the major programs are funded well below the President's budget request. NNSA is funded at \$10.6 billion, fully \$1.1 billion (10 percent) below the President's request. Late last year, the Senate ratified the new Strategic Arms Reduction Treaty (START), requiring new funding for implementation, which was partially provided in the final FY 2011 Department of Defense and Full-Year Continuing Appropriations Act.

In a move sure to raise objections from the White House, the House Committee rejected the Administration's plan to suspend work on the nuclear waste repository at Yucca Mountain in Nevada. The House-passed bill provides \$45 million to support activities at the site, of which \$20 million is directed to the Nuclear Regulatory Commission to continue their review of the application to license the site.

Timing for Senate action on the FY 2012 appropriations bills, including the companion Energy and Water Development bill, is uncertain.

### **Lewis-Burke Associates Analysis of President's FY 2012 Request:**

President Obama's FY 2012 budget request continues his commitment to investing in scientific research through the Department of Energy (DOE) to foster discovery science, innovation, and advances in technology to develop clean, alternative sources of energy to enhance national, economic, and energy security. The President's budget proposals for DOE continue to seek the nation's best talent from universities, industry, and the national laboratories to tackle the challenge of developing clean energy technologies and keeping the United States globally competitive. Additional resources are requested to maintain a safe and secure nuclear stockpile and promote nonproliferation of nuclear weapons.

Even with an overall freeze proposed for domestic discretionary spending, the President would provide \$29.5 billion overall for the Department of Energy (DOE) in his FY 2012 budget request, a \$3.12 billion (11.8 percent) increase above the FY 2010 enacted funding level. The President continues strong support for basic research through the Office of Science, requesting \$5.42 billion for these programs, an increase of \$452.2 million (9.1 percent) above the FY 2010 enacted level. The President also requests \$550 million for the Advanced Research Projects Agency-Energy (ARPA-E) to support the development of game-changing energy technologies.

Continuing Secretary of Energy Chu's signature initiative, the President requests three additional Energy Innovation Hubs to focus on batteries and energy storage, rare earth materials, and new electricity grid technologies. The proposed Hubs will double the number from three to six Hubs out of the eight originally proposed. The budget request would also sustain support for the existing 46 Energy Frontier Research Centers which focus on specific barriers to creating new energy technologies and the research to overcome them.

The Administration does not resubmit the RE-ENERGYSE education initiative, which Congress has rejected for funding in the past two budget cycles. The Administration's budget proposal would continue to support fellowships.

For clean energy research, development, and deployment programs, the President's FY 2012 budget would significantly increase research for solar energy, biofuels and biomass R&D, and more than double funding for the development of geothermal energy. Additional investments are also proposed for development of the smart grid. Clean vehicle technologies continue to be a priority for the President with two proposals to expedite development and market entry – a \$200 million —"Race to the Top" program designed to remove regulatory barriers to electric vehicles and promote the development of infrastructure to support them, and conversion of the existing \$7,500 tax credit for electric vehicles into a rebate for consumers purchasing such vehicles. The President also proposes a —"Race to Green" grant competition to focus on reducing energy usage in commercial buildings by 20 percent by 2020.

The President continues to support the development of nuclear energy and specifically new energy technologies, such as Small Modular Reactors. Carbon capture and storage technologies continue to be a focus of the Fossil Energy program; however, due to significant investment of Recovery Act funds, no new demonstrations are proposed. As in previous budgets, the President proposes to eliminate funding for oil and gas technologies and approximately \$4 billion in annual tax subsidies to oil, gas, and other fossil fuels.

For the defense-related programs under DOE's National Nuclear Security Administration (NNSA), the President proposes a \$1.9 billion increase, to \$11.8 billion. Within this amount the budget request proposes \$7.6 billion for DOE Weapons Activities, an increase of \$1.2 billion above the FY 2010 enacted level to support the nation's stockpile of nuclear weapons and total of \$2.5 billion is proposed for nuclear non-proliferation activities, which continue to be a priority and the Administration.

### **Office of Science**

For the basic research programs of the Office of Science, President Obama would provide \$5.42 billion overall, which is \$452.2 million (9.1 percent) above the FY 2010 enacted level. The Administration continues to advocate for the doubling of physical sciences funding for the Office of Science programs. During the State of the Union address, the President spoke of our generation's —"Sputnik Moment," challenging the nation to invest in clean energy technology along with biomedical research and information technology. The Director of the Office of Science, Dr. Bill Brinkman, highlights the —arsenal of basic science capabilities|| that can be used to tackle the barriers to new energy technologies.

#### *Basic Energy Sciences*

The President would provide \$1.985 billion for Basic Energy Sciences (BES), the largest budget within the Office of Science. The proposed budget request would be \$386.0 million (24.1 percent) above the FY 2010 enacted funding level. In FY 2012, DOE will continue support for the existing Energy Frontier Research Centers (EFRCs), many of which are based at U.S. universities.

Funding of \$34 million is also requested to support the initiation of the new Batteries and Energy Storage Energy Innovation Hub, which is resubmitted to Congress. The new Hub will focus on the design of advanced materials architectures; control of charge transfer and transport; development of probes of the chemistry and physics of energy storage; and the development of multi-scale computational models. Funding totaling \$24.3 million is also requested to support the Fuels from Sunlight Hub approved in FY 2010. BES is responsible for the operation and management of several major DOE user facilities, for which nearly \$971 million is requested. Construction will continue on the National Synchrotron Light Source II.

The Administration renews its plans to develop the science base for computational design of advanced engines. The multi-scale simulation of internal combustion engines will focus on models that span vast scale ranges; improve understanding of fundamental physical and chemical properties; and developing science-based predictive simulation and modeling design of engines.

#### *High Energy Physics*

For High Energy Physics (HEP), a total of \$797.2 million is requested by the President, an increase of \$6.4 million (0.8 percent) above the FY 2010 enacted level. As scheduled, the Administration would end the running of the Tevatron at the Fermi National Accelerator Laboratory (Fermilab) in Illinois at the end of 2011. The shutdown of the Tevatron is planned as Fermilab transitions to new programs and projects important to the future of the laboratory. DOE would support U.S. experiments and scientists at the Large Hadron Collider (LHC) in Geneva, Switzerland.

Construction continues for the NuMI Off-Axis Neutrino Appearance (NOvA) project. The President requests \$15 million for the Long Baseline Neutrino Experiment to maintain the viability of the Deep Underground Science and Engineering Laboratory (DUSEL) project while DOE assesses the options for proceeding with the program. The \$15 million proposed would be split between HEP (\$10 million) and Nuclear Physics (\$5 million). Funding is included for project engineering and design activities for LBNE (\$17 million) and for the Muon to Electron (Mu2e) experiment (\$22.5 million).

#### *Nuclear Physics*

The President's budget would provide \$605.3 million for nuclear physics research, an increase of \$82.84 million (15.9 percent) above the FY 2010 enacted level. In FY 2012, the request would continue construction for the upgrade at the Continuous Electron Beam Accelerator Facility (CEBAF), and proceed with design and engineering for the Facility for Rare Isotope Beams (FRIB).

#### *Biological and Environmental Research*

The FY 2012 budget request would provide \$717.9 million for Biological and Environmental Research (BER), an increase of \$129.9 million (22 percent) above the FY 2010 enacted level. The President's budget continues to support the three DOE Bioenergy Research Centers, the Joint Genome Institute, and other research facilities. The President proposes increases of \$65.9 million in foundational genomics and computational biosciences. The budget request would also increase support for Earth system modeling and other climate-related research.

#### *Advanced Scientific Computing Research*

The budget request would provide \$465.6 million for Advanced Scientific Computing Research (ASCR), an increase of \$82.4 million (21.5 percent) above the FY 2010 enacted level. The President's budget plan supports the acquisition, installation and testing of a ten petaflop, low-power IBM Blue Gene/Q computer at Argonne National Laboratory. Work would continue on a new prototype computer at the Oak Ridge National Laboratory as well. In FY 2012, the Administration intends to explore architectures on the path toward exascale computing and pursue multiple paths to overcoming key barriers. These activities will be carried out in coordination with NNSA activities. The budget request would continue research efforts at the Scientific Discovery through Advanced Computing (SciDAC), applied mathematics, and computer science.

#### *Fusion Energy*

The President requests \$399.7 million for Fusion Energy Sciences, which is \$17.95 million (4.3 percent) below the FY 2010 enacted funding level. The Administration request would fund the U.S. contributions to ITER, including research and development of key components, long-lead procurements, personnel, and the cash contribution to the ITER organization. The FY 2012 request would also continue support of advanced computational simulation of fusion plasmas and research at the three plasma science centers. The budget would also continue the High Energy Density Laboratory Plasma program which is a joint program with NNSA.

### *Workforce Development for Teachers and Scientists*

The Administration engages DOE in activities to support the development of the future workforce for scientists and teachers, requesting \$35.6 million, an increase of \$14.9 million (72 percent) above the FY 2010 level. This program funds the DOE Office of Science Graduate Fellowship program, which will support 320 fellows.

### **Energy Transformation Acceleration Fund (ARPA-E)**

The President would provide \$550 million to continue support for high-risk, high-reward transformational energy research and development through the Advanced Research Projects Agency-Energy (ARPA-E). Within this amount, \$521.9 million would be provided for projects, and \$28.1 million would be provided for program administration. ARPA-E was initially funded with \$400 million in the American Recovery and Reinvestment Act (ARRA), which has largely been utilized. The Administration also proposes an additional \$100 million in mandatory spending from the Wireless Innovation Fund for developing cutting-edge wireless technologies.

### **Energy Efficiency and Renewable Energy**

The President would provide \$3.2 billion for energy efficiency and renewable energy programs in his FY 2012 budget request. The request would represent an increase of \$983.7 million (44 percent) above the FY 2010 enacted level. These programs continue to receive strong Administration support as essential to developing the clean energy economy. For FY 2012, the Administration proposes several significant demonstration initiatives which are discussed below.

#### *Hydrogen Technology*

As it did last year, the Administration would restructure the Hydrogen Technology program, as the Hydrogen and Fuel Cell Technologies program. The President would provide \$100.45 million for the overall program, a reduction of \$69.85 million (41 percent) below the combined program level in FY 2010.

#### *Biomass and Biorefinery Systems R&D*

The Administration proposes \$340.5 million for the Biomass and Biorefinery Systems R&D program, an increase of \$124.3 million (58 percent) above the FY 2010 enacted level. Within the request, the Administration proposes to eliminate feedstock production trials, enhance development of algal and other advanced feedstocks, and expand efforts to develop advanced conversion technologies for pyrolysis oils and drop-in fuels. The Administration also proposes a Cellulosic Biofuels Reverse Auction to invigorate market-based cellulosic ethanol demonstration plants.

#### *Solar Energy*

A total of \$457.0 million would be provided for solar energy by President Obama in his FY 2012 budget request. This would represent an increase of \$213.6 million (87.8 percent) above the FY 2010 enacted funding level. The Department would ramp up a major new effort to achieve grid-parity for Photovoltaics (PV), allocating \$207.4 million for R&D, \$20.1 million for systems integration, and \$3.5 million for market transformation. For Concentrating Solar Power (CSP) projects, the request would allocate \$49 million for development and storage activities.

#### *Wind Energy*

The President's request of \$126.9 million for wind energy would represent an increase of \$47.9 million (61 percent) above the FY 2010 enacted level. The Department would continue activities to promote and accelerate the development of offshore wind power in the U.S.

### *Geothermal Energy*

The Administration would continue to emphasize new sources of renewable energy, including a request to more than double the investment in geothermal energy, requesting \$101.6 million, an increase of \$58.4 million (136 percent) above the FY 2010 enacted level.

### *Water Power*

The budget request of \$38.5 million would be a reduction of \$10.2 million (21 percent) below the FY 2010 enacted funding level. Within the budget request, DOE plans to invest in conventional hydropower that will stimulate private sector deployment of capacity and efficiency upgrades. For marine and hydrokinetic (MHK) devices, DOE would focus on the development, testing, and deployment of advanced prototypes to establish baseline cost of energy and performance data.

### *Vehicle Technologies*

Continuing to emphasize the need for alternative sources of energy to power transportation in the United States, President Obama would provide \$588.0 million for the Vehicle Technologies program. This would represent an increase of \$283.8 million (93.3 percent) above the FY 2010 enacted level. The President would increase funding for batteries and power electronics, systems R&D on the electric drive to improve performance and cost, and development of supporting infrastructure to move mature battery technologies closer to market entry. The President has called for the domestic production of more than one million advanced technology vehicles by FY 2015.

### *Building Technologies*

President Obama proposes a —Race to Green|| initiative within the Building Technologies program and would more than double this program in his FY 2012 request. The budget request would provide \$470.7 million for the DOE Building Technologies program, an increase of \$251.7 million (115 percent) above the FY 2010 enacted level. DOE proposes \$100 million for a new major competitive —"Race to Green" program to improve the efficiency of the commercial sector. An additional \$60 million is also requested as part of the Better Buildings Initiative to retrofit commercial buildings and achieve energy efficiencies and emission reductions.

### *Industrial Technologies*

For the Industrial Technologies program the President's budget request would provide \$319.8 million, an increase of \$225.5 million (239 percent) above the FY 2010 enacted funding level. Two activities will be significantly increased – the Next Generation Materials program at \$100.8 million and the Next Generation Manufacturing Processes by \$77.4 million. The President proposes a new Energy Innovation Hub focused on critical rare earth materials.

### **Electricity Delivery and Energy Reliability**

A total of \$237.7 million would be provided in the President's budget request to continue activities associated with developing the smart electricity grid and securing the nation's energy delivery system. The request would represent an increase of \$69.2 million (41.1 percent) above the FY 2010 enacted funding level. The President also proposes a new Energy Innovation Hub for the Smart

Grid within the R&D program. Within the \$192.8 million requested for R&D, the President proposes \$60.8 million for clean energy transmission and reliability; \$45.0 million for smart grid R&D; \$57.0 million for energy storage; and \$30.0 million for cyber security for energy delivery systems.

### **Nuclear Energy**

A total of \$754.0 million would be allocated to Nuclear Energy programs under the President's FY 2012 budget request, a decrease of 20.6 million (3 percent) below the FY 2010 enacted level. The Department proposes a reorganization of the program to include a new Nuclear Energy Enabling Technologies program (\$97.4 million) and a new Reactor Concepts Research, Development, and Demonstration program (\$125.0 million). Fuel cycle R&D would be focused on safe and environmentally-sound waste storage and management solutions and is requested at \$155.0 million for FY 2012.

### **Fossil Energy R&D**

For FY 2012 the President's budget would provide \$476.0 million for DOE's Fossil Energy R&D activities, a reduction of \$183.8 million (28 percent) below the FY 2010 enacted level. The Administration's budget proposal reduces funding for coal R&D providing \$291.4 million, a reduction of \$102.1 million (26 percent) below the FY 2010 enacted level. While the Administration continues to focus on the development of carbon capture and storage technologies, no new funding is requested for demonstration projects because these activities, including FutureGen 2.0, are strongly supported with Recovery Act funds. The Administration proposes to terminate the Natural Gas Technologies program for savings of \$17.4 million. DOE would not continue the unconventional fossil energy technologies program in FY 2012 for savings of \$19.5 million.

### **Loan Guarantee Programs**

The President's FY 2012 budget proposal for DOE includes three loan programs. The President requests up to \$36 billion in authority to guarantee loans for nuclear power plants, and \$200 million in appropriated credit subsidy for the cost of loan guarantees for renewable energy systems and technology projects. For Advanced Technology Vehicle Manufacturing, DOE requests \$6 million to support ongoing loan monitoring activities. The President also requests \$100 million for loan guarantee subsidy costs to support up to \$2 billion in loan authority for universities, schools, and hospitals to invest in energy efficiency retrofits (note: this program would need to be authorized by Congress).

### **National Nuclear Security Administration**

For the defense-related activities of DOE, the President requests a total of \$11.78 billion for the National Nuclear Security Administration (NNSA), which is \$568.2 million (5 percent) above the FY 2010 enacted level. The mission of NNSA is to maintain the scientific and technological expertise to maintain a safe, secure, and reliable nuclear weapons stockpile.

For Weapons Activities, the Administration requests \$7.63 billion, an increase of \$620.9 (8.9 percent) above the FY 2010 enacted level. Within this amount, \$1.96 billion is requested for work associated with the directed stockpile, an increase of \$65.2 million (3 percent) above the FY 2010 level. For the various campaigns that underpin the scientific, engineering and computing expertise

needed to secure the nation's nuclear stockpile, the budget request would provide \$405.9 million, an increase of \$40.7 million (11 percent) above the FY 2010 enacted funding level. For the Advanced Simulation and Computing Campaign, \$628.9 million is proposed, an increase of \$13.2 million (2 percent) above FY 2010.

For Readiness in Technical Base and Facilities, the FY 2012 budget request includes \$2.33 billion, an increase of \$477.2 million (26 percent) above FY 2010. This program provides infrastructure investments at the DOE national laboratories involved in the weapons activities.

For Defense Nuclear Nonproliferation activities, President Obama requests \$2.55 billion, a decrease of \$137.7 million (5 percent) below the FY 2010 enacted level. This program is focused on monitoring nuclear activities around the world and securing nuclear materials that are vulnerable to theft or diversion from legitimate purposes.

Addressing the legacy of more than 60 years of nuclear weapons work at sites around the country, the President requests \$5.4 billion for defense environmental cleanup at DOE national laboratories and other sites, a reduction of \$233.6 million (4 percent) below the FY 2010 enacted level.