FUNDING BY APPROPRIATION

(Discretionary dollars in thousands)

Department of Energy Budget by Appropriation	FY 2013 Current	FY 2014 Enacted	FY 2015 Request	FY 2015 vs. FY 2014 $	FY 2015 vs. FY 2014 %
Energy and Water Development and Related Agencies					
Energy Programs					
Energy Efficiency and Renewable Energy	1,691,757	1,900,641	2,316,749	+416,108	+21.9%
Electricity Delivery and Energy Reliability	129,196	147,242	180,000	+32,758	+22.2%
Nuclear Energy	708,429	888,376	863,386	-24,990	-2.8%
Fossil Energy Programs					
Clean Coal Technology	0	0	-6,600	-6,600	N/A
Fossil Energy Research and Development	498,715	561,931	475,500	-86,431	-15.4%
Naval Petroleum and Oil Shale Reserves	14,129	19,999	19,950	-49	-0.2%
Elk Hills School Lands Fund	0	0	15,580	+15,580	N/A
Strategic Petroleum Reserve	182,625	189,360	205,000	+15,640	+8.3%
Northeast Home Heating Oil Reserve	3,590	8,000	1,600	-6,400	-80.0%
Total, Fossil Energy Programs	***699,059***	***779,290***	***711,030***	***-68,260***	***-8.8%***
Uranium Enrichment D&D Fund	448,231	598,574	530,976	-67,598	-11.3%
Energy Information Administration	99,508	116,999	122,500	+5,501	+4.7%
Non-Defense Environmental Cleanup	223,457	231,741	226,174	-5,567	-2.4%
Science	4,681,195	5,066,372	5,111,155	+44,783	+0.9%
Advanced Research Projects Agency - Energy	250,636	280,000	325,000	+45,000	+16.1%
Departmental Administration	119,195	126,449	129,052	+2,603	+2.1%
Office of Indian Energy Policy and Programs	0	0	16,000	+16,000	N/A
Office of the Inspector General	39,803	42,120	39,868	-2,252	-5.3%
Title 17 - Innovative Technology					
Loan Guarantee Program	0	20,000	7,000	-13,000	-65.0%
Advanced Technology Vehicles Manufacturing Loan Program	5,686	6,000	4,000	-2,000	-33.3%
Total, Energy Programs	***9,096,152***	***10,203,804***	***10,582,890***	***+379,086***	***+3.7%***
Atomic Energy Defense Activities					
National Nuclear Security Administration					
Weapons Activities	6,966,855	7,781,000	8,314,902	+533,902	+6.9%
Defense Nuclear Nonproliferation	2,237,420	1,954,000	1,555,156	-398,844	-20.4%
Naval Reactors	994,118	1,095,000	1,377,100	+282,100	+25.8%
Federal Salaries and Expenses/1	377,457	377,000	410,842	+33,842	+9.0%
Cerro Grande Fire Activities	-61	0	0	0	N/A
Total, National Nuclear Security Administration	***10,575,789***	***11,207,000***	***11,658,000***	***+451,000***	***+4.0%***
Environmental and Other Defense Activities					
Defense Environmental Cleanup	4,627,054	5,000,000	5,327,538	+327,538	+6.6%
Other Defense Activities	760,030	755,000	753,000	-2,000	-0.3%
Defense Nuclear Waste Disposal	-727	0	0	0	N/A
Total, Environmental and Other Defense Activities	***5,386,357***	***5,755,000***	***6,080,538***	***+325,538***	***+5.7%***
Total, Atomic Energy Defense Activities	***15,962,146***	***16,962,000***	***17,738,538***	***+776,538***	***+4.6%***
Power Marketing Administrations					
Southeastern Power Administration	0	0	0	0	N/A
Southwestern Power Administration	11,243	11,892	11,400	-492	-4.1%
Western area Power Administration (CROM)	90,949	95,930	93,372	-2,558	-2.7%
Falcon and Amistad Operating and Maintenance Fund	220	420	228	-192	-45.7%
Colorado River Basins	-23,000	-23,000	-23,000	0	N/A
Transmission Infrastructure Program	0	0	0	0	N/A
Total, Power Marketing Administrations	***79,412***	***85,242***	***82,000***	***-3,242***	***-3.8%***
Federal Energy Regulatory Commission (FERC)	0	0	0	0	N/A
Subtotal, Energy and Water Development and Related Agencies	***25,137,710***	***27,251,046***	***28,403,428***	***+1,152,382***	***+4.2%***
Uranium Enrichment D&D Fund Discretionary Payments	0	0	-463,000	-463,000	N/A
Excess Fees and Recoveries, FERC	-279	-26,236	0	+26,236	+100.0%
Total, Discretionary Funding by Appropriation	**25,137,431**	**27,224,810**	**27,940,428**	**+715,618**	**+2.6%**

1/Formerly Office of the Administrator

Science

Proposed Appropriation Language

For Department of Energy expenses including the purchase, construction, and acquisition of plant and capital equipment, and other expenses necessary for science activities in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), including the acquisition or condemnation of any real property or facility or for plant or facility acquisition, construction, or expansion, and purchase of not more than [25] *17* passenger motor vehicles for replacement only, including [one law enforcement vehicle, one ambulance, and one bus, $5,071,000,000] *two buses, $5,111,155,000*, to remain available until expended: *Provided*, That [$185,000,000] *$189,393,000* shall be available until September 30, [2015] *2016*, for program direction[: *Provided further*, That not more than $22,790,000 may be made available for U.S. cash contributions to the International Thermonuclear Experimental Reactor project until its governing Council adopts the recommendations of the Third Biennial International Organization Management Assessment Report: *Provided further*, That the Secretary of Energy may waive this requirement upon submission to the Committees on Appropriations of the House of Representatives and the Senate a determination that the Council is making satisfactory progress towards adoption of such recommendations].

Explanation of Change

Appropriation language updates reflect the funding and replacement passenger motor vehicle levels requested in FY 2015, and does not extend FY 2014 restrictions on ITER funding related to governing Council meetings to be held during FY 2014.

Public Law Authorizations

Science:

- Public Law 95-91, "Department of Energy Organization Act", 1977
- Public Law 102-468, "Energy Policy Act of 1992"
- Public Law 108-153, "21st Century Nanotechnology Research and Development Act 2003"
- Public Law 109-58, "Energy Policy Act of 2005"
- Public Law 110-69, "America COMPETES Act of 2007"
- Public Law 111-358, "America COMPETES Reauthorization Act of 2010"

Nuclear Physics:

- Public Law 101-101, "1990 Energy and Water Development Appropriations Act," establishing the Isotope Production and Distribution Program Fund
- Public Law 103-316, "1995 Energy and Water Development Appropriations Act," amending the Isotope Production and Distribution Program Fund to provide flexibility in pricing without regard to full-cost recovery

Workforce Development for Teachers and Scientists:

- Public Law 101–510, "DOE Science Education Enhancement Act of 1991"
- Public Law 103–382, "The Albert Einstein Distinguished Educator Fellowship Act of 1994"

Science

($K)

FY 2013 Current	FY 2014 Enacted	FY 2014 Current	FY 2015 Request
4,681,195	5,066,372	5,066,372	5,111,155

Overview

The Office of Science mission is to deliver the scientific discoveries and major scientific tools that transform our understanding of nature and advance the energy, economic, and national security of the United States. The Office of Science is the Nation's largest Federal sponsor of basic research in the physical sciences and the lead Federal agency supporting fundamental scientific research for energy.

The Office of Science accomplishes its mission and advances national goals by supporting:

- *The frontiers of science*—discovering nature's mysteries from the study of subatomic particles, atoms, and molecules that are the building blocks of the materials of our everyday world to the DNA, proteins, and cells that are the building blocks of entire biological systems; each of the programs in the Office of Science supports research to probe the most fundamental questions of its disciplines.
- *The 21st Century tools of science*—providing the Nation's researchers with over 30 state-of-the-art national scientific user facilities, the most advanced tools of modern science, enabling the U.S. to remain at the forefront of science, technology, and innovation.
- *Science for energy and the environment*—advancing a clean energy agenda through fundamental research on energy production, conversion, storage, transmission, and use and through advancing our understanding of the earth and its climate; targeted investments include the three DOE Bioenergy Research Centers (BRCs), the Energy Frontier Research Centers (EFRCs), two Energy Innovation Hubs, and atmospheric process and climate modeling research.

The Office of Science has long been a leader of U.S. scientific discovery and innovation. Over the decades, Office of Science investments and accomplishments in basic research have provided the foundations for new technologies, businesses, and industries, making significant contributions to our Nation's economy and quality of life. Select scientific accomplishments in FY 2013 enabled by the Office of Science programs are described in the program budget narratives. Additional descriptions of recent science discoveries can be found at http://science.energy.gov/stories-of-discovery-and-innovation/.

Highlights and Major Changes in the FY 2015 Budget Request

The Office of Science FY 2015 Request is for $5.11 billion, growing by $44.8 million or 0.9% relative to the FY 2014 appropriation. The FY 2015 Request supports a balanced research portfolio that invests in discovery science—research that probes some of the most fundamental questions in high energy, nuclear, and plasma physics; materials and chemistry; biological systems and earth system components; and mathematics—as well as basic research that underpins advances in clean energy. The request supports about 22,000 investigators at over 300 U.S. academic institutions and at all of the DOE laboratories. The Office of Science user facilities continue to offer capabilities unmatched anywhere in the world; nearly 28,000 researchers from universities, national laboratories, industry, and international partners are expected to use the these facilities in FY 2015. The FY 2015 Request supports the construction of new user facilities necessary to provide world class research capabilities in the United States and targeted research and development (R&D), such as accelerator R&D, necessary for future facilities and facility upgrades to deliver desired capabilities and maximize scientific potential.

- *Advanced Scientific Computing Research (ASCR)* supports research to discover, develop, and deploy computational and networking capabilities to analyze, model, simulate, and predict complex phenomena important to DOE. ASCR grows $62.9 million or 13.2% relative to the FY 2014 appropriation. The increase provides support for research and the development of tools underpinning data-intensive science and for research in critical technologies and system

integration to accelerate the development of component technologies needed for extreme-scale computing. The FY 2015 Request supports improvements at the two Leadership Computing Facilities to prepare for 75–200 petaflop upgrades at each facility, and more than doubles the production computing capacity at the National Energy Research Scientific Computing Center (NERSC) to address growing demand. Also supports the initiation of a post-doctoral training program for high-end computational science and engineering.

- *Basic Energy Sciences (BES)* supports fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies. BES increases $94.6 million or 5.5% from the FY 2014 appropriation. The requests continues support for on-going core research, EFRCs, and the Fuels from Sunlight and Batteries and Energy Storage Energy Innovation Hubs. Operations of five synchrotron light sources, five nanoscale research centers, and two neutron scattering centers are supported at optimal levels. The request also provides for the Advanced Photon Source Upgrade, National Synchrotron Light Source II (NSLS-II) Experimental Tools, and Linac Coherent Light Source II projects. Decreases due to the completion of NSLS-II construction in FY 2014 and the transition of the Lujan Center to a safe storage condition in FY 2015 are offset by investments in strategic areas. In particular, funding is requested for a new investment in computational materials sciences for the development of open source community codes for the design of functional materials.
- *Biological and Environmental Research (BER)* supports fundamental research and scientific user facilities to achieve a predictive understanding of complex biological, climatic, and environmental systems for a secure and sustainable energy future. BER increases by $18.3 million or 3.0% over the FY 2014 appropriation. Increases support a new climate model development and validation strategy that exploits new software engineering and computational upgrades to facilitate development of higher resolution earth-system models that are compatible with near-term and next-generation computers. The request continues support for core research in Genomic Science and the three DOE BRCs, while funding for Radiological Sciences is decreased. Operations are supported at near-optimal levels for BER's three scientific user facilities, the Joint Genome Institute, the Environmental Molecular Sciences Laboratory, and the Atmospheric Radiation Measurement Climate Research Facility.
- *Fusion Energy Sciences (FES)* supports research to expand the fundamental understanding of matter at very high temperatures and densities and to build the scientific foundation of fusion energy. FES decreases $88.7 million or 17.6% from the FY 2014 appropriation. Funding is provided for the U.S. Contributions to ITER project, including the delivery of major hardware components. The National Spherical Torus Experiment Upgrade (NSTX-U), completed in FY 2014, begins full research operations in FY 2015. Increased funding is provided for DIII-D and NSTX scientific research programs to enable more support for collaborations with additional university and national laboratory scientists and students. The Alcator C-Mod facility resumed operation in FY 2014. It continues operation in FY 2015 during which time a transition plan will be developed for the facility. Support for research in general plasma physics continues, while high energy density laboratory plasmas decreases in FY 2015.
- *High Energy Physics (HEP)* supports research toward understanding how the universe works at its most fundamental level by discovering the most elementary constituents of matter and energy, probing the interactions among them, and exploring the basic nature of space and time itself. HEP decreases by $52.5 million or 6.6% below the FY 2014 appropriation. Investments support full operations of existing HEP facilities and experiments, including the first full year of running with the NOvA detector in the world's most intense neutrino beam. The request supports the planned construction funding profile for the Muon to Electron Conversion Experiment, and new MIEs for the Large Hadron Collider (LHC) ATLAS (A Large Toroidal LHC Apparatus) and Compact Muon Solenoid (CMS) detector upgrades. The FY 2015 request increases to support the second year of fabrication of the Large Synoptic Survey Telescope and investments in accelerator R&D. Research funding decreases in FY 2015 to offset these critical investments.
- *Nuclear Physics (NP)* supports research to discover, explore, and understand all forms of nuclear matter, supporting experimental and theoretical research to create, detect, and describe the widely varied forms of nuclear matter that can exist in the universe, including those that are no longer found naturally. NP increases $24.4 million or 4.3% relative to the FY 2014 appropriation. The increase supports the construction of Facility for Rare Isotope Beams consistent with the performance baseline profile approved in August 2013. Funding for the 12 GeV Continuous Electron Beam

Accelerator Facility Upgrade decreases as accelerator commissioning is completed in FY 2015 and construction transitions to operations funding. Funding also provides for operations of the Relativistic Heavy Ion Collider for 22 weeks, and for the operations of approximately 37 weeks of beam time at the Argonne Tandem Linac Accelerator System. Core research is held nearly flat with FY 2014.

Basic and Applied R&D Coordination

Coordination between the Department's basic research and applied technology programs is a high priority for the Secretary of Energy. The Department has a responsibility to coordinate its basic and applied research programs to effectively integrate R&D conducted by the science and technology communities (including national laboratories, universities, and private companies) that support the DOE mission. Coordination between the basic and applied programs is enhanced through activities such as joint planning meetings and technical community workshops, annual contractor/awardee meetings, joint research solicitations, focused "tech teams" and working groups in targeted research areas, and collaborative program management of DOE's Small Business Innovation Research and Small Business Technology Transfer programs. Co-funding research activities and facilities at the DOE laboratories and funding mechanisms that encourage broad partnerships are additional means to facilitate greater communication and research integration within the basic and applied research communities. Specific collaborative activities are highlighted in the "Basic and Applied R&D Coordination" sections of each individual Office of Science program budget justification narrative.

High-Risk, High-Reward Research[a]

The Office of Science incorporates high-risk, high-reward basic research elements in its research portfolios to drive scientific discoveries and technological breakthroughs. High-risk, high-reward research ideas that challenge current thinking, yet are scientifically sound, are integrated with other mission-driven fundamental research within the Office of Science program portfolios, projects, and individual awards. The Office of Science continues to emphasize cultivating and improving the program management practices and policies that foster support for this research. In addition to the activities noted above, Committees of Visitors consisting of panels of external subject matter experts assess the balance and impact of the portfolios triennially. Several mechanisms are used by the Office of Science to identify and develop high-reward research topics, including Federal advisory committees, program and topical workshops, interagency working groups, National Academies studies, and special Office of Science program solicitations. These activities have identified opportunities for new, compelling research and facilities and guide the programs in determining future funding priorities. As examples, some of these opportunities are captured in the following reports: *Synergistic Challenges in Data-Intensive Science and Exascale*, ASCR workshop report (2012); *From Quanta to the Continuum: Opportunities for Mesoscale Science*, by the Basic Energy Sciences Advisory Committee (BESAC) (2012); *Report of the BESAC Subcommittee on Future X-ray Light Sources* (2013); *Research at the Intersection of the Physical and Life Sciences*, by the National Research Council (2010); *Biosystems Design*, BER workshop report (2012); *Fundamental Physics at the Intensity Frontier* workshop report (2011); and *Nuclear Physics: Exploring the Heart of the Matter*, by the National Research Council (2012).

Scientific Workforce

The Office of Science and its predecessors have an over 50-year history in supporting the training of the skilled scientific workforce needed to tackle some of our Nation's most important societal challenges. In addition to the undergraduate and graduate research internship programs supported through the Office of Science's Office of Workforce Development for Teachers and Scientists, the six Office of Science research programs support the training of undergraduates, graduate students, and postdoctoral researchers through ongoing sponsored research awards at universities and the DOE national laboratories. The research program offices also support targeted graduate-level experimental training in areas associated with scientific user facilities, such as particle and accelerator physics, neutron and x-ray scattering, and nuclear physics. The Office of Science coordinates with other DOE offices and other agencies on best practices for training programs and program evaluation through active participation in the National Science and Technology Council's Committee on Science, Technology, Engineering, and Mathematics Education (CoSTEM). The Office of Science also participates in the American

[a] In compliance with the reporting requirements in the America COMPETES Act of 2007 (P.L. 110-69, section 1008).

Association for the Advancement of Science's Science & Technology Policy Fellowships program and the Presidential Management Fellows Program, supporting a limited number of highly qualified scientists to bring their technical expertise to DOE headquarters for 1–2 years.

Science
Funding by Congressional Control ($K)

	FY 2013 Current	FY 2014 Enacted	FY 2014 Adjustments	FY 2014 Current	FY 2015 Request	FY 2015 vs. FY 2014 Enacted
Advanced Scientific Computing Research	**405,000**	**478,093**	**0**	**478,093**	**541,000**	**+62,907**
Basic Energy Sciences						
Research	1,504,053	1,609,929	0	1,609,929	1,667,800	+57,871
Construction						
13-SC-10 Linac Coherent Light Source-II, SLAC	0[a]	75,700	0	75,700	138,700	+63,000
07-SC-06 National Synchrotron Light Source (NSLS) II, BNL	47,203	26,300	0	26,300	0	-26,300
Total, Construction	47,203	102,000	0	102,000	138,700	+36,700
Total, Basic Energy Sciences	**1,551,256**	**1,711,929**	**0**	**1,711,929**	**1,806,500**	**+94,571**
Biological and Environmental Research	**560,657**	**609,696**	**0**	**609,696**	**628,000**	**+18,304**
Fusion Energy Sciences						
Research	377,776[b]	305,177	0	305,177	266,000	-39,177
Construction						
14-SC-60 ITER	0[b]	199,500	0	199,500	150,000	-49,500
Total, Fusion Energy Sciences	**377,776**	**504,677**	**0**	**504,677**	**416,000**	**-88,677**
High Energy Physics						
Research	715,742	745,521	0	745,521	719,000	-26,521
Construction						
11-SC-40 Long Baseline Neutrino Experiment, FNAL	3,781	16,000	0	16,000	0	-16,000
11-SC-41 Muon to Electron Conversion Experiment, FNAL	8,000	35,000	0	35,000	25,000	-10,000
Total, Construction	11,781	51,000	0	51,000	25,000	-26,000
Total, High Energy Physics	**727,523**	**796,521**	**0**	**796,521**	**744,000**	**-52,521**

[a] Prior to FY 2013, LCLS-II received funding as an MIE. FY 2013 funding was requested as a line item, but due to a Continuing Resolution, $22,500,000 in FY 2013 was executed as an MIE.

[b] ITER was established as a construction project in FY 2014. The FY 2013 appropriation included $377,776,000 as a single Congressional control containing $124,000,000 for ITER and $253,776,000 for other Fusion Energy Sciences activities.

	FY 2013 Current	FY 2014 Enacted	FY 2014 Adjustments	FY 2014 Current	FY 2015 Request	FY 2015 vs. FY 2014 Enacted
Nuclear Physics						
Operation and Maintenance	466,676[a]	488,638	0	488,638	487,073	-1,565
Construction						
14-SC-50 Facility for Rare Isotope Beams, Michigan State University	0[a]	55,000	0	55,000	90,000	+35,000
06-SC-01 12 GeV CEBAF Upgrade, TJNAF	40,572	25,500	0	25,500	16,500	-9,000
Total, Construction	40,572	80,500	0	80,500	106,500	+26,000
Total, Nuclear Physics	**507,248**	**569,138**	**0**	**569,138**	**593,573**	**+24,435**
Workforce Development for Teachers and Scientists	**17,486**	**26,500**	**0**	**26,500**	**19,500**	**-7,000**
Science Laboratories Infrastructure						
Infrastructure Support						
Payment in Lieu of Taxes	1,385	1,385	0	1,385	1,412	+27
Facilities and Infrastructure	900	900	0	900	3,100	+2,200
Oak Ridge Landlord	5,934	5,951	0	5,951	5,777	-174
Total, Infrastructure Support	8,219	8,236	0	8,236	10,289	+2,053
Construction						
15-SC-75 Infrastructure and Operational Improvements at PPPL	0	0	0	0	25,000	+25,000
15-SC-76 Materials Design Laboratory at ANL	0	0	0	0	7,000	+7,000
15-SC-77 Photon Science Laboratory Building at SLAC	0	0	0	0	12,890	+12,890
15-SC-78 Integrative Genomics Building at LBNL	0	0	0	0	12,090	+12,090
13-SC-70 Utilities Upgrade, FNAL	0	34,900	0	34,900	0	-34,900
13-SC-71 Utility Infrastructure Modernization, TJNAF	0	29,200	0	29,200	0	-29,200
12-SC-70 Science and User Support Building, SLAC	14,512	25,482	0	25,482	11,920	-13,562
10-SC-70 Research Support Building and Infrastructure Modernization, SLAC	36,382	0	0	0	0	0
10-SC-71 Energy Sciences Building, ANL	32,030	0	0	0	0	0
10-SC-72 Renovate Science Lab, Phase II, BNL	14,530	0	0	0	0	0
Total, Construction	97,454	89,582	0	89,582	68,900	-20,682
Total, Science Laboratories Infrastructure	**105,673**	**97,818**	**0**	**97,818**	**79,189**	**-18,629**
Safeguards and Security	**77,506**	**87,000**	**0**	**87,000**	**94,000**	**+7,000**
Program Direction	**174,862**	**185,000**	**0**	**185,000**	**189,393**	**+4,393**

[a] The Facility for Rare Isotope Beams (FRIB) was established as a separate construction project in FY 2014. The FY 2013 Operations and Maintenance line in Nuclear Physics includes $22,000,000 in FY 2013 for FRIB and $444,676,000 for other activities.

	FY 2013 Current	FY 2014 Enacted	FY 2014 Adjustments	FY 2014 Current	FY 2015 Request	FY 2015 vs. FY 2014 Enacted
Small Business Innovation Research (SC portion)	**116,088**	**0**	**0**	**0**	**0**	**0**
Subtotal, Science	**4,621,075**	**5,066,372**	**0**	**5,066,372**	**5,111,155**	**+44,783**
Small Business Innovation Research (DOE transfer)	**60,120**	**0**	**0**	**0**	**0**	**0**
Total, Science Appropriation	**4,681,195**	**5,066,372**	**0**	**5,066,372**	**5,111,155**	**+44,783**
Federal FTEs	**956**	**956**	**0**	**956**	**975**	**+19**

SBIR/STTR

- FY 2013 Current: SBIR: $102,766,000 was reprogrammed within SC and $52,771,000 was transferred from other DOE programs; STTR: $13,322,000 was reprogrammed within SC and $7,349,000 was transferred from other DOE programs.
- FY 2014 projected: SBIR: $112,366,000 and STTR: $16,053,000 (SC only).
- FY 2015 Request: SBIR: $118,426,000; STTR: $16,334,000 (SC Only).