4190	Outlays, net (total)	5	14	

In FY 2010, the Department closed the Yucca Mountain Project and the Office of Civilian Radioactive Waste Management. Residual obligations and outlays in this account are associated with Yucca Mountain project closeout activities and remaining legacy activities such as accounting.

ENERGY PROGRAMS

Federal Funds

SCIENCE

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]. *(Energy and Water Development and Related Agencies Appropriations Act, 2014.)*

Program and Financing (in millions of dollars)

Identification code 89–0222–0–1–251		2013 actual	2014 est.	2015 est.
	Obligations by program activity:			
0001	Basic Energy Sciences	1,575	1,719	1,806
0002	Advanced Scientific Computing Research	405	479	541
0003	Biological and Environmental Research	557	614	628
0004	High Energy Physics	728	798	744
0005	Nuclear Physics	507	570	594
0006	Fusion Energy Sciences	378	505	416
0007	Science Laboratories Infrastructure	106	102	79
0008	Science Program Direction	247	185	189
0009	Workforce Development for Teachers and Scientists	18	27	20
0010	Safeguards and Security	78	87	94
0011	Small Business Innovation Research	97	8	
0012	Small Business Technology Transfer	19	1	
0799	Total direct obligations	4,715	5,095	5,111
0801	Reimbursable program	580	610	610
0900	Total new obligations	5,295	5,705	5,721
	Budgetary Resources:			
	Unobligated balance:			
1000	Unobligated balance brought forward, Oct 1	43	29	
1021	Recoveries of prior year unpaid obligations	22		
1050	Unobligated balance (total)	65	29	
	Budget authority:			
	Appropriations, discretionary:			
1100	Appropriation	4,876	5,071	5,111
1121	Appropriations transferred from other accts [89–0213]	9		
1121	Appropriations transferred from other accts [89–0321]	26		
1121	Appropriations transferred from other accts [89–0309]	9		
1121	Appropriations transferred from other accts [89–0318]	3		
1121	Appropriations transferred from other accts [89–0319]	11		
1130	Appropriations permanently reduced	–255	–5	
1160	Appropriation, discretionary (total)	4,679	5,066	5,111
	Spending authority from offsetting collections, discretionary:			
1700	Collected	596	610	620
1701	Change in uncollected payments, Federal sources	–16		
1750	Spending auth from offsetting collections, disc (total)	580	610	620
1900	Budget authority (total)	5,259	5,676	5,731
1930	Total budgetary resources available	5,324	5,705	5,731
	Memorandum (non-add) entries:			
1941	Unexpired unobligated balance, end of year	29		10
	Change in obligated balance:			
	Unpaid obligations:			
3000	Unpaid obligations, brought forward, Oct 1	4,544	4,101	4,094
3010	Obligations incurred, unexpired accounts	5,295	5,705	5,721
3020	Outlays (gross)	–5,716	–5,712	–5,876
3040	Recoveries of prior year unpaid obligations, unexpired	–22		
3050	Unpaid obligations, end of year	4,101	4,094	3,939
	Uncollected payments:			
3060	Uncollected pymts, Fed sources, brought forward, Oct 1	–450	–434	–434
3070	Change in uncollected pymts, Fed sources, unexpired	16		
3090	Uncollected pymts, Fed sources, end of year	–434	–434	–434
	Memorandum (non-add) entries:			
3100	Obligated balance, start of year	4,094	3,667	3,660
3200	Obligated balance, end of year	3,667	3,660	3,505
	Budget authority and outlays, net:			
	Discretionary:			
4000	Budget authority, gross	5,259	5,676	5,731
	Outlays, gross:			
4010	Outlays from new discretionary authority	2,088	3,572	3,610
4011	Outlays from discretionary balances	3,628	2,140	2,266
4020	Outlays, gross (total)	5,716	5,712	5,876
	Offsets against gross budget authority and outlays:			
	Offsetting collections (collected) from:			
4030	Federal sources	–356	–330	–330
4033	Non-Federal sources	–240	–280	–290
4040	Offsets against gross budget authority and outlays (total)	–596	–610	–620
	Additional offsets against gross budget authority only:			
4050	Change in uncollected pymts, Fed sources, unexpired	16		
4070	Budget authority, net (discretionary)	4,679	5,066	5,111
4080	Outlays, net (discretionary)	5,120	5,102	5,256
4180	Budget authority, net (total)	4,679	5,066	5,111
4190	Outlays, net (total)	5,120	5,102	5,256

Advanced Scientific Computing Research.—The Advanced Scientific Computing Research (ASCR) program supports advanced computational research, applied mathematics, computer science, and networking. The program also supports the development, maintenance, and operation of large high performance computing and network facilities, including the Leadership Computing Facilities at Oak Ridge and Argonne National Laboratories, the National Energy Research Scientific Computing Facility at Lawrence Berkeley National Laboratory, and the Energy Sciences Network. The request includes research, in partnership with other science programs, on the application of high performance computer simulation and modeling to science problems. Research will continue to focus on coordinated efforts to address the challenges for emerging computing hardware such as energy management and fault tolerance. Research will also continue to address the challenges of data-intensive science including the massive quantities of data generated by Office of Science facilities and collaborations. ASCR efforts will consider and integrate the full spectrum of these challenges from hardware to applications.

Basic Energy Sciences.—The Basic Energy Sciences (BES) program supports fundamental research in materials science, chemistry, geosciences, and biosciences to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels. BES core research awards support individual scientists and small groups to pursue discovery-driven research with broad energy relevance. BES also supports two innovative approaches to integrated research: Energy Frontier Research Centers (EFRCs) and Energy Innovation Hubs. The EFRCs support multi-year, multi-investigator scientific collaborations focused on overcoming hurdles in basic science that hinder advances in energy technologies. The two BES-managed Energy Innovation Hubs—the Fuels from Sunlight Hub and the Batteries

SCIENCE—Continued

and Energy Storage Hub—consist of larger, highly integrated teams working to solve priority science and technology challenges. A new investment in computational materials science is also requested in FY 2015 to develop community software codes for the design of functional materials.

The BES program operates large national user research facilities: a complementary set of light sources, neutron scattering centers, and research centers for nanoscale science with electron beam characterization capabilities. These facilities probe materials in space, time, and energy to investigate the inner workings of matter and answer some of the most challenging grand science questions. The request includes support to use these state-of-the-art national user facilities at optimal levels. Research areas that will benefit from these facilities include materials science, chemistry, structural biology, and energy technology development. The request supports construction of the Linac Coherent Light Source-II (LCLS-II) and increased funding for early operations of the National Synchrotron Light Source-II (NSLS-II), while NSLS ceases operations. The request also supports two major item of equipment projects: the Advanced Photon Source Upgrade and the NSLS-II Experimental Tools. The BES operations of the Lujan Neutron Scattering Center will cease and funding is requested for safe storage of facility components.

Biological and Environmental Research.—The Biological and Environmental Research (BER) science portfolio examines complex biological, climatic, and environmental systems across spatial scales ranging from sub-cellular to global, individual molecules to entire ecosystems, and temporal scales ranging from nanoseconds to millennia. BER-supported research and scientific facilities address the science underpinning diverse and critical global challenges, from the sustainable and affordable production of renewable biofuels in an environmentally conscientious manner to the simulation and prediction of climate change and greenhouse gas emissions relevant to energy production. Multidisciplinary systems approaches are employed to study and predict dynamic biological interactions from the subcellular molecular level to large scale processes performed by complex plant and microbial communities. The program plays a vital role in supporting research examining atmospheric processes; climate change; and the impacts of climate change, including warmer temperatures, changes in precipitation, increased levels of greenhouse gases, changing distributions of weather extremes on different ecosystems. The program also seeks understanding of the critical role that biogeochemical processes play in controlling the cycling and mobility of materials in the Earth's subsurface and across key surface-subsurface interfaces in the environment.

The budget continues support for key core research areas and scientific user facilities in bioenergy, climate, and environmental research. The three DOE Bioenergy Research Centers continue to address the fundamental science underpinning the development of cost-effective cellulosic biofuels. Genomic sciences investments target the development of synthetic biology tools and technologies and integrative computation-driven analysis of experimental datasets to accelerate the interpretation of complex genomes that are sequenced and analyzed at the DOE Joint Genome Institute. Mesoscale research targets multiscale bioimaging of subcellular organization and communication. Observational research on clouds and aerosols at the Atmospheric Radiation Measurement Climate Research Facility (ARM) will improve understanding of the priority climatic sensitive regions of the Arctic and tropics, and modeling efforts will shift their emphasis from global scale dynamics to higher resolution scale interactions for these priority regions. New investment in Climate Model Development and Validation will enable restructuring the model architecture, new software engineering and computational upgrades, and incorporating scale-aware physics in all model components. The new Climate and Environmental Data, Analysis, and Visualization activity will combine Earth system models with energy and infrastructure models and field observations to provide enhanced tools for analysis and visualization. The Environmental Molecular Sciences Laboratory enables experimental and computational research on physical, chemical, and biological processes to resolve molecular-scale challenges in areas such as atmospheric aerosols and trace gases, biofuel feedstocks, biogeochemistry subsurface science and energy materials.

Fusion Energy Sciences.—The Fusion Energy Sciences (FES) program aims to expand the fundamental understanding of matter at very high temperatures and densities and to build the scientific foundation needed to develop a fusion energy source. Understanding the scientific character of the burning plasma state, as well as establishing the science for maintaining this state for long durations, is a major objective of FES research. Another major research objective is increasing the fundamental understanding of basic plasma science for a broad range of science-based applications. In addition to funding U.S. contributions to ITER, an international project that aims to demonstrate the scientific and technical feasibility of fusion energy, the FES request continues support for three domestic fusion research facilities (National Spherical Torus Experiment, DIII-D, and Alcator C-Mod); international partnerships that leverage U.S. expertise, high-performance computational simulations based on experimentally validated theoretical models; the development of advanced fusion-relevant materials and technology innovations; and the invention of new measurement techniques. FES will also continue to support the pursuit of discovery plasma science, including research in plasma astrophysics and low-temperature plasmas, intermediate-scale magnetic confinement experimental platforms, and high energy density laboratory plasmas.

High Energy Physics.—The High Energy Physics (HEP) program aims to understand how our 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. The program encompasses both experimental and theoretical particle physics research at the Energy, Intensity, and Cosmic Frontiers, as well as related advanced accelerator and detector technology research and development (R&D). The primary mode of experimental research involves the study of collisions of beams of intense and/or energetic particles using large particle accelerators or colliding beam facilities.

The HEP request supports Intensity Frontier research, primarily at the Fermi National Accelerator Laboratory, including a diverse portfolio of experiments studying the fundamental properties of neutrinos, quarks and leptons, and searching for new forces and phenomena. The HEP request also supports the Energy Frontier research program at the Large Hadron Collider (LHC), including support for software and computing, pre-operations, and maintenance of the U.S.-built systems that are part of the LHC detectors and accelerator commissioning and accelerator physics studies using the LHC, and the Cosmic Frontier program focused on discovering the nature of dark matter and dark energy using sensitive, state-of-the-art detectors underground, in space, and mounted on telescopes.

In addition to contributing to breakthrough scientific discoveries, HEP research also makes major contributions to accelerator technology development and provides the expertise necessary for the expansion of such technology into medicine, industry, and

homeland security, as well as materials, biology, and chemistry research using light sources. The request includes continued support for the Accelerator R&D Stewardship program initiated in FY 2014 to foster development of novel accelerator technology with broad applications.

Nuclear Physics.—The Nuclear Physics (NP) program addresses three broad yet tightly interrelated scientific thrusts: strong interactions among quarks and gluons (quantum chromodynamics) and how they assemble into the various forms of matter; the structure of atomic nuclei at their limits of existence and nuclear astrophysics to address the origin of the elements and the evolution of the cosmos; and measurements of fundamental symmetries of neutrons and nuclei to improve understanding of fundamental interactions and the properties of neutrinos and nuclei.

NP develops the scientific knowledge, technologies, and trained workforce needed to underpin NP and DOE's mission areas. The advancement of knowledge of nuclear matter and its properties is intertwined with nuclear power, nuclear medicine, national security, environmental and geological sciences, and isotope production.

The request provides continued support of the Relativistic Heavy Ion Collider at Brookhaven National Laboratory to characterize new states of matter and phenomena that occur in hot, dense nuclear matter; the Continuous Electron Beam Accelerator Facility (CEBAF) at Thomas Jefferson National Accelerator Facility to understand the substructure of the nucleon; and the Argonne Tandem Linear Accelerator System at Argonne National Laboratory for the study of nuclear structure and nuclear astrophysics. Construction continues on the 12 GeV CEBAF Upgrade project to double the electron beam energy at CEBAF, which will open the opportunity for new discoveries and an understanding of quark confinement; and on the Facility for Rare Isotope Beams at Michigan State University, which will provide intense beams of rare isotopes for a wide variety of studies in nuclear structure, nuclear astrophysics and fundamental symmetries. The Isotope Development and Production for Research and Applications program will continue to develop and produce commercial and research radioisotopes that are in short supply, for provision to medical institutions, universities, research organizations, and industry for a wide array of uses and applications.

Science Laboratories Infrastructure.—The mission of Science Laboratories Infrastructure (SLI) program is to support scientific and technological innovation at Office of Science (SC) laboratories by funding and sustaining mission-ready infrastructure and fostering safe and environmentally responsible operations. Revitalizing facilities and providing modern laboratory infrastructure is critical to ensuring the continued mission readiness of SC laboratories. The program provides the modern laboratory infrastructure necessary to support world leadership by the SC national laboratories in the area of basic scientific research now and in the future.

Safeguards and Security.—The mission of Safeguards and Security (S&S) program is to support the Department's research at SC laboratories by ensuring appropriate levels of protection against unauthorized access, theft, or destruction of Department assets, and hostile acts that may have adverse impacts on fundamental science, national security, the health and safety of DOE and contractor employees, the public, and the environment.

Workforce Development for Teachers and Scientists.—The Workforce Development for Teachers and Scientists (WDTS) program supports undergraduate internships, graduate thesis research, and visiting faculty programs at the DOE laboratories; the Albert Einstein Distinguished Educator Fellowship for K-12 STEM teachers, which is administered by WDTS for DOE and for other federal agencies; and nationwide, middle- and high-school science competitions that annually culminate in the National Science Bowl in Washington, D.C. These investments help develop the next generation of scientists and engineers to support the DOE mission, administer its programs, and conduct its research. WDTS activities leverage the assets of DOE's 17 laboratories, which employ more than 30,000 workers with STEM backgrounds. The DOE laboratory system provides access to leading scientists; world-class scientific user facilities and instrumentation; and large-scale, multidisciplinary research programs unavailable in universities or industry.

Program Direction.—This program provides a highly skilled Federal workforce to develop and sustain world-class science programs that deliver the scientific discoveries and technological innovations needed to solve our nation's energy and environmental challenges and enable the U.S. to maintain its global competitiveness. The SC workforce is responsible for overseeing taxpayer dollars for science program development; program and project execution and management; managing the administrative, business, and technical aspects of research grants and contracts; overseeing 10 of the 17 DOE national laboratories; and providing public access to DOE's R&D results.

Object Classification (in millions of dollars)

Identification code 89–0222–0–1–251		2013 actual	2014 est.	2015 est.
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	104	116	115
11.3	Other than full-time permanent	2	3	2
11.5	Other personnel compensation	1	1	1
11.8	Special personal services payments	1	1	1
11.9	Total personnel compensation	108	121	119
12.1	Civilian personnel benefits	30	33	33
21.0	Travel and transportation of persons	3	3	3
23.2	Rental payments to others	2	2	2
23.3	Communications, utilities, and miscellaneous charges	3	4	4
25.1	Advisory and assistance services	19	19	19
25.2	Other services from non-Federal sources	52	54	58
25.3	Other goods and services from Federal sources	13	14	14
25.4	Operation and maintenance of facilities	2,969	3,230	3,281
25.5	Research and development contracts	180	193	194
26.0	Supplies and materials	2	2	2
31.0	Equipment	295	198	176
32.0	Land and structures	243	555	537
41.0	Grants, subsidies, and contributions	796	667	669
99.0	Direct obligations	4,715	5,095	5,111
99.0	Reimbursable obligations	580	610	610
99.9	Total new obligations	5,295	5,705	5,721

Employment Summary

Identification code 89–0222–0–1–251		2013 actual	2014 est.	2015 est.
1001	Direct civilian full-time equivalent employment	956	956	975
2001	Reimbursable civilian full-time equivalent employment	.....	.....	.....

ADVANCED RESEARCH PROJECTS AGENCY—ENERGY

For necessary expenses in carrying out the activities authorized by section 5012 of the America COMPETES Act (Public Law 110–69), as amended, [$280,000,000] *$325,000,000*, to remain available until expended: *Provided*, That [$28,000,000] *$29,250,000* shall be available until September 30, [2015] *2016*, for program direction. *(Energy and Water Development and Related Agencies Appropriations Act, 2014.)*

Program and Financing (in millions of dollars)

Identification code 89–0337–0–1–270		2013 actual	2014 est.	2015 est.
	Obligations by program activity:			
0001	ARPA-E Projects	169	221	296