

19. RESEARCH AND DEVELOPMENT

The President is committed to making investments in research and development (R&D) that will grow our economy, sustain our competitive advantage in the global economy, and enable America to remain the world leader in innovation. In the same way that past federal R&D investments led to American leadership in biotechnology and the development of the Internet, the President's focus on science and innovation will help create the industries and jobs of the future and address the challenges and opportunities of the 21st Century. Investing in science and technology-based innovation will let us do things like produce vaccines that stay ahead of drug-resistant bacteria, find new answers in the fight against Alzheimer's and other diseases, devise new clean energy technologies, and promote new advanced manufacturing opportunities in areas such as new materials.

The President's 2015 Budget provides \$135 billion for Federal research and development (R&D), including the conduct of R&D and investments in R&D facilities and equipment. Even in the current highly constrained budget environment, the Administration continues to champion R&D, providing a 1 percent funding increase

over 2014 levels¹ for R&D. In addition, the Opportunity, Growth, and Security Initiative includes \$5.3 billion for research and development. These investments reinforce the Administration's commitment to science, technology, and innovation. In conjunction with this investment, the 2015 Budget's proposed expanded, simplified, and permanent extension of the Research and Experimentation tax credit will spur private investment in R&D by providing certainty that the credit will be available for the duration of the R&D investment.

Finally, the 2015 Budget continues to strengthen U.S. international leadership by investing in the high-tech knowledge-based economy and innovation-fueled growth industries. These investments will enable us to lead the world in clean energy, advanced manufacturing, aerospace, agriculture, and healthcare while protecting the environment for future generations. The Budget will help ensure that the U.S. continues its long-standing and robust leadership in public and private sector R&D and maintains the high quality of our R&D institutions and the entrepreneurial nature of our R&D enterprise.

¹ Please note that R&D spending figures for FY 2014 are preliminary and may change as agency operating plans are finalized.

I. PRIORITIES FOR FEDERAL RESEARCH AND DEVELOPMENT ¹

The Budget² provides support for a broad spectrum of research and development, including multidisciplinary research and exploratory, potentially transformative, high-risk research proposals that could fundamentally improve our understanding of nature, revolutionize fields of science, and lead to the development of radically new technologies. The Administration's commitment to supporting ground-breaking research and development is underscored by the Opportunity, Growth, and Security Initiative, which includes funding for a number of innovative research and development programs and projects across a wide-array of disciplines including clean energy, climate resiliency, and basic research into fundamental scientific questions affecting human health, our understanding of the universe, food and agriculture, and national security. Descriptions of individual Opportunity, Growth, and Security Initiative proposals are included in the Agency Budget Chapters and in Agency Congressional Justifications.

Promoting Sustainable Economic Growth and Job Creation through Innovation

The Administration recognizes the Government's role in fostering scientific and technological breakthroughs,

and has committed significant resources to ensuring that America continues to lead the world in science and engineering and the innovations of the future. The Budget provides \$65 billion for basic and applied research because such research is a reliable source of new knowledge, which drives job creation and lasting economic growth.

The 2015 Budget continues to increase total Federal investment in the combined budgets of three key basic research agencies: the National Science Foundation (NSF), the Department of Energy (DOE) Office of Science, and the laboratories of the Department of Commerce (DOC) National Institute of Standards and Technology (NIST). The Budget proposes \$13.0 billion in 2015 for these three agencies, an increase of \$0.2 billion over 2014 funding. These investments will expand the frontiers of human knowledge and establish the foundation for industries and jobs of the future, including in clean energy, advanced manufacturing, biotechnology, Big Data, and new materials.

Private sector R&D investments remain essential to fostering and deploying innovation as they provide a much wider range of technology options than the Government alone can provide and play a critical role in translating scientific discoveries into commercially successful, innovative products and services. In order to provide businesses with greater confidence to invest, innovate, and grow the

² Note that some numbers in the text include non-R&D activities and thus will be different from the R&D numbers reflected in Table 19-1.

Budget proposes to simplify and enhance the Research and Experimentation tax credit, and make it permanent.

Moving Toward Cleaner American Energy

The Administration is committed to a future where the United States leads the world in research, development, demonstration, and deployment of clean-energy technologies to reduce air pollution, greenhouse-gas emissions, and dependence on oil, while creating high-wage, highly-skilled clean energy jobs and new businesses. The Budget advances the Administration's all-of-the-above energy strategy by investing in programs to drive innovation in the energy sector. These investments include: basic and applied research to address some of the fundamental unknowns to advancing clean energy technologies; research and development to create and dramatically improve clean energy products, such as solar panels and wind turbines, modular nuclear reactors, electric and other alternative-fuel vehicles, and energy efficient systems for homes and businesses; and appropriate assistance to American entrepreneurs and businesses to commercialize the technologies that will lead the world in new clean energy industries.

The Budget requests approximately \$6.9 billion for clean energy technology programs government-wide to accelerate the transition to a low-carbon economy and position the United States as the world leader in the energy industries of the 21st Century.

In the Department of Energy, the 2015 Budget provides about \$5.2 billion in discretionary funding for clean energy technology programs. It provides \$2.3 billion for the Office of Energy Efficiency and Renewable Energy (EERE) to accelerate research and development, build on ongoing successes, increase the use of critical clean energy technologies, and further reduce costs. Within EERE, the Budget increases funding by 15 percent above 2014 enacted levels for sustainable vehicle and fuel technologies, by 39 percent for energy efficiency and advanced manufacturing activities, and by 16 percent for innovative renewable power projects such as those in the SunShot Initiative to make solar power directly price-competitive with other forms of electricity by 2020. The U.S. Department of Agriculture also pursues complementary biofuel efforts to support development of next-generation biofuels. The Budget also provides funding within EERE to help State and local decision-makers develop policies and regulations that encourage greater deployment of renewable energy and energy efficiency technologies and to improve the integration and utilization of natural gas in manufacturing and transportation. Within the Office of Electricity Delivery and Energy Reliability, the Budget also invests in R&D and other activities that will facilitate the transition from our current electricity delivery infrastructure to a Smart Grid. The Budget also supports clean energy R&D through the Office of Nuclear Energy and Office of Fossil Energy, including funding for advanced small modular reactors R&D and activities primarily dedicated to further lowering the costs of carbon capture and storage and advanced power systems. This includes \$25 million in the Office of Fossil Energy to demonstrate capture and stor-

age of carbon emissions from natural gas power systems. The Budget also includes \$325 million for the Advanced Research Projects Agency–Energy (ARPA-E), a program that seeks to fund transformative energy research, and over \$900 million for basic clean energy research in the Office of Science. In addition, the 2015 Budget invests \$2 billion over the next ten years from existing Federal oil and gas development royalty revenues in a new Energy Security Trust that would provide a reliable stream of mandatory funding for R&D on cost-effective transportation alternatives utilizing cleaner sources of energy such as electricity, homegrown biofuels, renewable hydrogen, and domestically produced natural gas.

Defeating Diseases and Improving Americans' Health Outcomes

The Administration is committed to funding Federal R&D investments in biomedical and health research and to supporting policies to improve health. The 2015 Budget strongly supports research that has the potential to foster innovations in health and to accelerate the pace of discovery in the life sciences, especially imaging, neuroscience, bioinformatics, and high-throughput biology. These discoveries will help improve the prevention and treatment of diseases and support the bioeconomy of the future.

The 2015 Budget proposes \$30.2 billion for the National Institutes of Health (NIH) to support high-quality, innovative biomedical research both on-campus and at research institutions across the country. The Budget supports basic and translational research to increase understanding of the causes of disease and spur development of diagnostic tests, treatments, and cures. The Budget maintains the pace and scope of research and stimulates the development of new innovative approaches by funding a new advanced research program modeled after the cutting-edge Defense Advanced Research Projects Agency (DARPA) program at DOD. In addition, the Budget continues to invest in Alzheimer's research, and includes \$100 million for NIH's contribution to the multi-agency BRAIN Initiative. To increase transparency and efficiency, NIH will implement new measures to reduce grant review administrative costs and improve reporting on disease specific funding levels.

The Budget includes over \$500 million in mandatory R&D funding for the independent Patient-Centered Outcomes Research Institute (PCORI) to conduct clinical comparative effectiveness research, as authorized by the Affordable Care Act.

The Budget also proposes \$1 billion for medical and prosthetic research across the Department of Veterans Affairs.

The Budget for the Department of Agriculture includes about \$76 million for intramural research on zoonotic animal diseases such as Rift Valley Fever, Bovine Spongiform Encephalopathy, Avian Influenza, Bovine Tuberculosis, and Brucellosis, that could spread to humans. In addition, about \$110 million would be spent on intramural food safety research to reduce the incidence of bacteria such as salmonella, E coli, Campylobacter and Listeria; food borne

parasites; and natural toxins such as aflatoxins that affect public health.

Revitalizing and Transforming American Manufacturing

The Budget continues to support the “National Strategic Plan for Advanced Manufacturing,” a blueprint for Federal efforts in partnership with industry and universities to develop and commercialize the emerging technologies that will create high-quality manufacturing jobs and sustain a renaissance in American manufacturing. The 2015 Budget provides \$2.2 billion for Federal R&D directly supporting advanced manufacturing at NSF, DOD, DOE, DOC, and other agencies. For example, the Budget provides DOE with \$305 million for important technology efforts to improve industrial energy efficiency and clean energy manufacturing through innovative processes and advanced materials. These innovations will enable U.S. companies to cut manufacturing costs and reduce the lifecycle energy consumption of technologies, while improving product quality and accelerating product development. The Budget also includes \$141 million for the Hollings Manufacturing Extension Partnership, in part to support Manufacturing Technology Acceleration Centers to assist manufacturers in adopting new technologies. It includes \$2.4 billion through the Opportunity, Growth, and Security Initiative to establish the National Network of Manufacturing Innovation, which will develop cutting-edge manufacturing technologies and capabilities. The Administration has already launched four manufacturing innovation institutes and has committed to funding five additional institutes to bring the total to nine. In addition, as part of the broader effort, the Budget invests in the National Robotics Initiative (NRI) to develop robots that work with or beside people to extend or augment human capabilities. In addition to having applications in space, biology, and security, robots have the potential to increase the productivity of workers in the manufacturing sector. Another important component of the advanced manufacturing R&D strategy is the Materials Genome Initiative. By leveraging advances in computer simulations and the overall material knowledge-base, this initiative aims to increase the rate by which we understand and characterize new materials, providing a wealth of practical information that entrepreneurs and innovators will be able to use to develop new products and processes for U.S. firms. Manufacturing at the nanoscale is also a part of this effort, with important work highlighted in a sustainable nanomanufacturing signature program under the National Nanotechnology Initiative.

Understanding Global Climate Change and Its Impacts

The U.S. Global Change Research Program (USGCRP) coordinates and integrates Federal research and applications to assist the Nation and the world in understanding, assessing, predicting, and responding to the human-induced and natural processes of global change and their related impacts and effects. Within coordinated USGCRP interagency investments, the 2015 Budget supports the

goals set forth in the program’s 2012-2021 strategic plan, which include: advancing scientific knowledge of the integrated natural and human components of the Earth system; providing the scientific basis to inform and enable timely decisions on adaptation and mitigation; building sustained assessment capacity that improves the United States’ ability to document changes on the regional, landscape, and local level to understand, anticipate, and respond to global change impacts and vulnerabilities; and advancing communications and education to broaden public understanding of global change. The 2015 Budget also supports an integrated suite of climate change observations, process-based research, modeling and assessment and adaptation science activities that serve as a foundation for providing timely and responsive information including but not limited to technical reports, impact and vulnerability assessments, and adaptation response strategies to a broad array of stakeholders. All of these outcomes are essential elements of the USGCRP 2012-2021 strategic plan and are described as important deliverables for USGCRP in the President’s Climate Action Plan. The 2015 Budget provides approximately \$2.5 billion for USGCRP programs.

Enabling Better Stewardship of Natural Resources and Our Environment

Sustainable stewardship of natural resources requires strong investments in research and development in the natural sciences to strengthen the scientific basis for decision-making. The 2015 Budget provides \$2.6 billion in R&D funding to support resource decision making and environmental stewardship at the Department of the Interior (DOI), Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), and Department of Agriculture (USDA). The Budget provides strong support for R&D related to the management of public lands, ecosystems, energy permitting, and Earth observations (such as earth observing satellites and monitoring of water, wildlife, and invasive species). The Budget also provides strong support for science to inform ocean and coastal stewardship, with investments in ocean observations and exploration, coastal mapping and assessment, coastal ecosystem research, and coastal habitat restoration. The Budget strengthens investments in the safety and security of the Nation through research and development related to hazards such as earthquakes, floods, and extreme weather. Responding to the President’s Council of Advisors on Science and Technology (PCAST) report, “Agricultural Preparedness & the United States Agricultural Research Enterprise”, the 2015 Budget invests \$325 million in USDA’s Agriculture and Food Research Initiative (AFRI), which will be distributed through competitively awarded extramural research grants to support breakthrough research in national priorities including water quantity and quality, sustainable agricultural production, and climate change, as well as bioenergy, food safety, and human nutrition. The budget also invests in three multi-disciplinary research centers focused on topics including advanced bio-based manufacturing and anti-microbial research to

address national challenges in food and agriculture, as well as including funding to respond to the serious problem of pollinator losses.

Strengthening Our Security through Science and Technology

Federal R&D investments in security aim to meet the threats of the future and to develop new innovative security capabilities. The Department of Defense's (DOD) R&D investments in the 2015 Budget focus on areas deemed to have the greatest impact on our nation and future military requirements. To this end, the 2015 Budget provides \$64.4 billion for DOD R&D, an increase of 1 percent from the 2014 enacted level.

The 2015 Budget proposes \$11.5 billion for DOD's Science & Technology (S&T) program, which consists of basic research, applied research and advanced technology development.

The 2015 Budget also maintains DOD's critical role in fostering breakthrough approaches for discovering promising technologies with \$2.9 billion for the Defense Advanced Research Projects Agency (DARPA). This funding level represents an increase of \$136 million from the 2014 enacted level. Investing in DARPA's high-risk and high-reward science is an Administration priority and critical to maintaining the technological superiority of the U.S. military.

For DOE, the Budget proposes \$4.7 billion for investments in R&D for the Nation's nuclear stockpile, naval nuclear propulsion, and nonproliferation goals.

The Budget supports investments in state-of-the-art technologies and solutions for Federal, State, and local homeland security operators. The Budget proposes \$514 million in funding for the Department of Homeland Security R&D programs that protect the Nation's people and critical infrastructure from chemical, biological, and cyber attacks. The Budget also proposes \$300 million to fund the remaining requirement for a state-of-the-art facility to study and develop countermeasures for emerging zoonotic diseases that threaten human health and our agricultural industry.

Preparing Our Students with Skills through Science, Technology, Engineering, and Mathematics (STEM) Education

Our Nation's competitiveness depends on our ability to improve and expand science, technology, engineering, and mathematics (STEM) learning in the United States. The

Budget proposes a fresh Government-wide reorganization of STEM education programs designed to enable more strategic investment in STEM education and more critical evaluation of outcomes, while leveraging Government resources more effectively to meet national goals. This proposal reduces fragmentation of STEM education programs across Government, and focuses efforts around the five key areas identified by the Federal STEM Education 5-Year Strategic Plan: P-12 instruction; undergraduate education; graduate education; broadening participation in STEM to women and minorities traditionally underrepresented in these fields; and education activities that typically take place outside of the classroom.

Expanding Our Capabilities in Space

The Budget provides \$17.5 billion for the National Aeronautics and Space Administration (NASA) to support NASA's efforts to drive innovation through the aerospace sector and enhance our capabilities in space. Such capabilities are essential for communications, geopositioning, intelligence gathering, Earth observation, national defense, developing space transportation technologies, and scientific discovery. As part of these efforts, NASA will conduct technology development and test programs aimed at increasing these capabilities and reducing the cost of NASA, other government, and U.S. commercial space activities. NASA will also support innovative fundamental research and systems-level applications to reduce fuel needs, noise, and emissions of aircraft. Within NASA, the Budget provides \$1.8 billion for Earth Science to sustain progress toward important satellite missions and research to advance climate science and to sustain vital space-based Earth observations. The Budget provides \$5 billion for NASA Science to expand the frontiers of knowledge about the solar system, the universe, the Sun, and our planet and \$3 billion to develop the systems needed for human exploration of deep space. Also included in the NASA Budget is \$850 million for the Commercial Crew program, an innovative partnership with American industry to transport crew to the International Space Station, an orbiting research facility that will operate until at least 2024. The Budget provides \$2 billion for NOAA to fund development of the next generation of polar-orbiting and geostationary satellite systems, which are critical to weather forecasting, as well as satellite-borne measurements of sea level and potentially damaging solar storms.

II. FEDERAL R&D DATA

R&D is the collection of efforts directed toward gaining greater knowledge or understanding and applying knowledge toward the production of useful materials, devices, and methods. R&D investments can be characterized as basic research, applied research, development, R&D equipment, or R&D facilities. The Office of Management

and Budget has used those or similar categories in its collection of R&D data since 1949.

Federal R&D Funding

More than 20 Federal agencies fund R&D in the United States. The character of the R&D that these agencies fund

depends on the mission of each agency and on the role of R&D in accomplishing it. Table 19–1 shows agency-by-agency spending on basic research, applied research, development, and R&D equipment and facilities.

Basic research is systematic study directed toward a fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. Basic research, however, may include activities with broad applications in mind.

Applied research is systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.

Development is systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including

design, development, and improvement of prototypes and new processes to meet specific requirements.

Research and development equipment includes acquisition or design and production of movable equipment, such as spectrometers, research satellites, detectors, and other instruments. At a minimum, this category includes programs devoted to the purchase or construction of R&D equipment.

Research and development facilities include the acquisition, design, and construction of, or major repairs or alterations to, all physical facilities for use in R&D activities. Facilities include land, buildings, and fixed capital equipment, regardless of whether the facilities are to be used by the Government or by a private organization, and regardless of where title to the property may rest. This category includes such fixed facilities as reactors, wind tunnels, and particle accelerators.

III. OTHER MULTI-AGENCY R&D ACTIVITIES

Many research investments into the most promising areas for future industry, scientific discovery, and job creation are being addressed through multi-agency research activities coordinated through the National Science and Technology Council (NSTC) and other interagency forums. Most of these challenges simply cannot be addressed effectively by a single agency. Moreover, innovation often arises from combining the tools, techniques, and insights from multiple agencies. Details of two such interagency efforts – networking and information technology R&D and nanotechnology R&D – are described below.

Networking and Information Technology R&D: The multi-agency Networking and Information Technology Research and Development (NITRD) Program provides strategic planning for and coordination of agency research efforts in cyber security, high-end computing systems, advanced networking, software design, high-confidence systems, human computer interaction, cyber-physical systems, Big Data, health IT, wireless spectrum sharing, cloud computing, and other information technologies.

The 2015 Budget includes a focus on research to improve our ability to accelerate scientific discoveries and derive value from the fast-growing quantities and varieties of digital data (“Big Data”) while appropriately protecting the privacy of personal data. The Budget continues to prioritize cybersecurity research framed by the *Trustworthy Cyberspace: Strategic Plan for the Federal Cybersecurity R&D Program* to develop novel approaches and technolo-

gies that can protect U.S. systems from cyber-attacks, to promote R&D in high-end computing to address advanced applications, and to emphasize research that advances the efficient use of wireless spectrum and spectrum sharing technologies. Budget information for NITRD is available at www.nitrd.gov.

Nanotechnology R&D: To accelerate nanotechnology development the National Nanotechnology Initiative (NNI) member agencies focus on R&D of materials, devices, and systems that exploit the unique physical, chemical, and biological properties that emerge in materials at the nanoscale (approximately 1 to 100 nanometers). Participating agencies continue to support fundamental research for nanotechnology-based innovation, technology transfer, and nanomanufacturing through individual investigator awards; multidisciplinary centers of excellence; education and training; and infrastructure and standards development, including openly-accessible user facilities and networks. Furthermore, agencies have identified and are pursuing Nanotechnology Signature Initiatives in the national priority areas of sustainable nanomanufacturing, solar energy, sustainable design of nanoengineered materials, nanoinformatics and modeling, nanoscale nanotechnology for sensors, and nanoelectronics through close alignment of existing and planned research programs, public-private partnerships, and research roadmaps (for details see nano.gov/signatureinitiatives). Budget information is available at nano.gov.

Table 19-1. FEDERAL RESEARCH AND DEVELOPMENT SPENDING

(Budget authority, dollar amounts in millions)

	2013 Actual	2014 Enacted	2015 Proposed	Dollar Change: 2015 to 2014	Percent Change: 2015 to 2014
By Agency					
Defense ¹	63,838	63,856	64,430	574	1%
Health and Human Services	29,969	30,912	31,069	157	1%
Energy	10,740	11,359	12,309	950	8%
NASA	11,282	11,667	11,555	-112	-1%
National Science Foundation	5,319	5,729	5,727	-2	-0%
Commerce	1,360	1,632	1,597	-35	-2%
Agriculture	2,116	2,418	2,447	29	1%
Homeland Security	684	1,032	876	-156	-15%
Veterans Affairs	1,164	1,174	1,178	4	0%
Interior	785	840	925	85	10%
Transportation ¹	829	853	865	12	1%
Environmental Protection Agency	532	560	560	0	0%
Patient-Centered Outcomes Research Trust Fund	488	464	528	64	14%
Education	319	323	336	13	4%
Smithsonian Institution	238	232	252	20	9%
Other ¹	669	631	698	67	11%
TOTAL	130,332	133,682	135,352	1,670	1%
Basic Research					
Defense	1,835	1,931	2,052	121	6%
Health and Human Services	15,424	15,861	16,085	224	1%
Energy	3,851	4,046	4,143	97	2%
NASA	3,360	3,907	3,086	-821	-21%
National Science Foundation	4,357	4,711	4,708	-3	-0%
Commerce	184	215	224	9	4%
Agriculture	830	930	957	27	3%
Homeland Security	41	42	37	-5	-12%
Veterans Affairs	476	478	484	6	1%
Interior	51	52	55	3	6%
Transportation .....	.....	.....	.....	.....	.....
Environmental Protection Agency .....	.....	.....	.....	.....	.....
Patient-Centered Outcomes Research Trust Fund .....	.....	.....	.....	.....	.....
Education	6	6	6	0	0%
Smithsonian Institution	202	205	216	11	5%
Other	31	26	26	0	0%
SUBTOTAL	30,648	32,410	32,079	-331	-1%
Applied Research					
Defense	4,158	4,376	4,530	154	4%
Health and Human Services	14,294	14,851	14,783	-68	-0%
Energy	3,852	3,886	4,269	383	10%
NASA	2,689	2,444	2,389	-55	-2%
National Science Foundation	590	480	480	0	0%
Commerce	881	1,078	1,014	-64	-6%
Agriculture	1,046	1,224	1,238	14	1%
Homeland Security	210	209	213	4	2%
Veterans Affairs	614	622	618	-4	-1%
Interior	624	665	718	53	8%
Transportation ¹	628	646	672	26	4%
Environmental Protection Agency	450	473	473	0	0%
Patient-Centered Outcomes Research Trust Fund	488	464	528	64	14%
Education	190	191	201	10	5%
Smithsonian Institution .....	.....	.....	.....	.....	.....
Other	485	450	515	65	14%
SUBTOTAL	31,199	32,059	32,641	582	2%

Table 19-1. FEDERAL RESEARCH AND DEVELOPMENT SPENDING—Continued

(Budget authority, dollar amounts in millions)

	2013 Actual	2014 Enacted	2015 Proposed	Dollar Change: 2015 to 2014	Percent Change: 2015 to 2014
Development					
Defense	57,774	57,326	57,747	421	1%
Health and Human Services	35	29	29	0	0%
Energy	2,466	2,585	2,927	342	13%
NASA	5,064	5,162	6,009	847	16%
National Science Foundation .....	.....	.....	.....	.....	.....
Commerce	78	112	109	-3	-3%
Agriculture	162	181	173	-8	-4%
Homeland Security	321	348	311	-37	-11%
Veterans Affairs	74	74	76	2	3%
Interior	107	110	113	3	3%
Transportation	180	187	155	-32	-17%
Environmental Protection Agency	77	82	82	0	0%
Patient-Centered Outcomes Research Trust Fund .....	.....	.....	.....	.....	.....
Education	123	126	129	3	2%
Smithsonian Institution .....	.....	.....	.....	.....	.....
Other	153	155	157	2	1%
SUBTOTAL	66,614	66,477	68,017	1,540	2%
Facilities and Equipment					
Defense ¹	71	223	101	-122	-55%
Health and Human Services	216	171	172	1	1%
Energy	571	842	970	128	15%
NASA	169	154	71	-83	-54%
National Science Foundation	372	538	539	1	0%
Commerce	217	227	250	23	10%
Agriculture	78	83	79	-4	-5%
Homeland Security	112	433	315	-118	-27%
Veterans Affairs .....	.....	.....	.....	.....	.....
Interior	3	13	39	26	200%
Transportation	21	20	38	18	90%
Environmental Protection Agency	5	5	5	0	0%
Patient-Centered Outcomes Research Trust Fund .....	.....	.....	.....	.....	.....
Education .....	.....	.....	.....	.....	.....
Smithsonian Institution	36	27	36	9	33%
Other ¹ .....	.....	.....	.....	.....	.....
SUBTOTAL	1,871	2,736	2,615	-121	-4%

¹ The amounts reported for facilities and equipment and total R&D at the Department of Defense and Army Corps of Engineers were corrected. Also, the amounts for applied research and total R&D at the Department of Transportation were corrected and are not consistent with the amounts reported in the investment tables in Chapter 18.

