



## SSTI WEEKLY DIGEST

Helping Transform Technology-Based Economies

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### ***Special Federal Budget Issue***

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### ***Budget Analysis and Agency Summaries***

## **Budget Overview**

As in any budget there are winners and losers, but for the tech-based economic development community, there are far more winners than losers in the Obama Administration's FY11 budget proposal. Percentages referenced in this summary reflect the change from FY10 appropriations.

Among the winners:

- The National Science Foundation, NIST laboratories, and the Department of Energy's Office of Science continue on the path to doubling their budgets.
- The Administration tries to move regional innovation and clusters forward with proposals in a number of agencies, including:
  - \$75 million in the Economic Development Administration in the Department of Commerce for regional planning and matching grants within EDA to support the creation of Regional Innovation Clusters
  - \$135 million in budget authority at the U.S. Department of Agriculture for a Regional Innovation Initiative for rural communities which could translate to \$280 million in program activities
  - \$108 million at the Department of Labor for the proposed Workforce Innovation Fund that would provide funding for the demonstration of promising new ideas and for the replication of proven practices
  - \$11 million at the Small Business Administration to support enhanced small business

participation in regional economic clusters by awarding competitive grants to facilitate greater coordination of resources

- The Manufacturing Extension Partnership would increase by 4 percent to \$129.7 million.
- The Technology Innovation Program (TIP) would increase 14 percent or \$10 million to \$79.9 million.
- The [U.S. Global Change Research Program](#) would increase 21 percent or \$439 million to \$2.6 billion. The program is designed to improve understanding of uncertainties in climate science, expand global observing systems, develop science-based resources to support policymaking and resource management, and communicate findings broadly.
- The National Oceanic and Atmospheric Administration's (NOAA) R&D budget would increase by 22 percent or \$171 million to \$949 million.
- The Advanced Research Projects Agency-Energy (ARPA-E) would receive its first regular appropriation of \$300 million.
- New and previously approved Energy Innovation Hubs would receive \$107 million through the Department of Energy.
- The Department of Energy would launch a new \$50 million program, Regaining our Energy Science and Engineering Edge (RE-ENERGYSE) to inspire students and workers to pursue careers in science, engineering, and entrepreneurship related to clean energy.
- Solar energy, wind energy, and geothermal energy programs in the Department of Energy's Office of Energy Efficiency and Renewable Energy would all see double digit percentage increases.
- Myriad National Science Foundation programs are proposed for increases, some double digit increases, including Partnerships for Innovation (109 percent increase), the Engineering Research Centers (22.9 percent increase), Science and Technology Centers (14.3 percent increase), and the Experimental Program to Stimulate Competitive Research (EPSCoR) (4.9 percent increase).
- The total amount spent on Pell Grants for college students would increase by 29 percent or \$7.9 billion to \$34.9 billion.

Among the losers:

- One of the most publicized budget casualties was NASA's Constellation program, the program to return astronauts to the moon. Coming on the heels of the findings of the [Review of U.S. Human Space Flight Plans Committee](#), the shift in strategy away from returning to the moon was not surprising.
- NSF programs that did not fare as well as some others in the agency, include: the National Nanotechnology Initiative (3.9 percent decrease), Nanoscale Science and Engineering Centers (13.1 percent decrease), the Industry/University Cooperative Research Centers (level funding), and the Education and Human Resources Directorate with a 2.2 percent increase.
- The Department of Defense's Research, Testing, Development and Evaluation (RTD&E) would receive \$71.6 billion (5 percent decrease). RTD&E spending supports defense modernization through basic and applied research, fabrication of technology-demonstration devices, and development and testing of prototypes and full-scale preproduction hardware.
- The Department of Homeland Security's Science and Technology Directorate would receive \$1 billion (1 percent decrease).
- The Office of Fossil Energy in the Department of Energy would be cut by 20 percent to \$760.4 million.

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## Department of Agriculture

The Administration's FY11 budget request for the [Department of Agriculture](#) is \$148.6 billion (10 percent increase over the FY10 estimated budget). The full increase is borne by mandatory spending requirements, such as nutrition assistance and crop insurance programs. Mandatory spending comprises nearly 83 percent of the USDA budget and would climb to \$122.9 billion (14 percent increase).

USDA discretionary spending of \$25.7 billion (4 percent decrease) includes a new initiative to spur rural innovation and increases for competitive research grants, rural broadband expansion and renewable energy programs.

### **\$135 Million to Support Rural Innovation**

USDA proposes to establish a Regional Innovation Initiative for strategic planning and coordination of USDA and other sources of assistance for rural communities. The initiative would be funded through a five percent surtax on the appropriations of 20 existing USDA programs that could ultimately benefit by the strategic coordination.

Through this mechanism, the Administration anticipates generating \$135 million in budget authority which could translate to \$280 million in program activities. The USDA's [Rural Development](#) (RD) salaries and expenses line item would provide \$1.4 million to support the initiative.

### **Research Highlights**

- Requests \$429 million (64 percent increase), the highest funding level ever, for competitive grants through the Agriculture and Food Research Initiative, while maintaining formula grant levels. Included in the funding is an additional \$50 million for obesity research.
- Includes \$30 million (57 percent increase) for the Sustainable Agriculture Research and Education program to help with the development of agricultural innovations that improve profitability, environmental stewardship and quality of life.
- \$52 million (11 percent increase) for [Higher Education](#) programs through the [National Institute of Food and Agriculture](#), formerly the Cooperative State Research, Education and Extension Service,
- Provides \$19 million (46 percent increase) to strengthen regulatory oversight of biotechnology products and prevent regulated genetically engineered products from being co-mingled with non-regulated products.
- Requests \$1.2 billion (6 percent increase) for USDA internal research activities through the [Agricultural Research Service](#). Priorities would be research on new products/product quality/value added, livestock production, crop production, food safety, livestock protection, crop protection, human nutrition and environmental stewardship.

### **TBED Highlights**

The [Rural Business-Cooperative Service](#) (RBS) administers RD's rural business and cooperative services programs to promote economic development. The service offers several loan and grant programs to support rural business development. The total RBS budget would drop to \$364 million (34 percent decrease). The decline is attributable largely to the elimination of funding for [Biorefinery Assistance Guaranteed Loans](#), which received \$245 million in FY10.

Discretionary funding for RBS programs related to TBED includes:

- [Business and Industry Guarantee Loan](#) program — \$40 million (24 percent decrease) to provide protection against loan losses so that lenders are willing to extend credit to establish, expand, or modernize rural businesses;
- [Rural Enterprise Grants](#) program — \$39 million (no change) to provide grants for rural projects that finance and facilitate development of small and emerging rural businesses;
- [Rural Energy for America](#) program — \$39 million (\$1 million decrease), including \$5 million (75 percent decrease) for guaranteed loans and \$34 million (70 percent increase) for grants. The program supports the purchase of renewable energy systems and energy efficiency improvements in rural areas. An additional \$70 million (17 percent increase) is available in mandatory funding, including \$34 million (17 percent increase) for loans and \$36 million (16.1 percent increase) for grant;
- [Rural Microentrepreneur Assistance Program](#) — \$8 million total (33 percent increase) in discretionary funding, including \$7 million (133 percent increase) for guaranteed loans and \$1 million (66 percent decrease) for grants. The loans will be used to establish reserves for relending to microentrepreneurs, and the grants are made to microenterprise development organizations which may relend a portion to provide training, operational support, business planning, and market development assistance. An additional \$4 million is available in mandatory funding (no change), including \$2 million for loans (100 percent increase) and \$2 million for grants (30 percent decrease); and,
- [Rural Business Opportunity Grant Program](#) — \$3 million (40 percent decrease) to promote sustainable economic development in rural communities with exceptional needs through training and technical assistance for business development, entrepreneurs, and economic development officials and to assist with economic development planning.

## Broadband Programs

Rural Development's [Rural Utilities Service](#) (RUS) supports electricity, water and waste disposal services in rural areas and helps to extend telecommunications and broadband networks in underserved regions. The FY11 budget request includes \$643 million (7 percent decrease) for RUS. [Broadband](#) programs would receive \$40 million (15 percent decrease), including \$22 million (24 percent decrease) for direct loans and \$18 million (no change) for grants. These programs help to increase the availability of high-speed Internet access and would be used for projects similar to those supported under the Recovery Act broadband provisions. [Distance Learning and Telemedicine](#) programs would receive \$30 million (21 percent decrease) to assist rural communities that would otherwise be without access to learning and medical services over the Internet.

## Other Highlights

The [National Agriculture Statistics Service](#) (NASS) provides statistics in service to U.S. agriculture. NASS statistics provide the information necessary to keep agricultural markets stable and efficient and to help maintain a consistency for all users of agricultural statistics. In the FY11 request, NASS would receive \$165 million (2 percent increase). This funding includes support for the second year of the Census of Agriculture's five-year cycle, and enhanced remote sensing technology to monitor the impacts of climate change.

USDA's [Economic Research Service](#) (ERS) provides economic and other social science information and analysis on agriculture, food, the environment, and rural development. Under the FY11 budget proposal, ERS is allocated \$87 million (6 percent increase).

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## Department of Commerce

The Administration's FY11 discretionary budget request for the [Department of Commerce \(DOC\)](#) is \$8.93 billion, a decrease of \$4.77 billion from FY10 enacted levels. This decrease is due to a \$5.96 billion reduction to the Bureau of the Census following completion of the current decennial census. Most research and economic development initiatives within the DOC are slated for increases in the new budget with the notable exception of the [Economic Development Administration \(EDA\)](#).

The Economic Development Administration, charged with promoting regional economic development in distressed communities, would receive \$286.2 million in FY11 (2 percent decrease). The decrease would be borne in its entirety by the grant programs and specifically by the Global Climate Change Mitigation Incentive Fund. The mission of that fund has been infused throughout EDA's investment policy guidance and funding priorities.

The budget request realigns funding levels to reflect the Administration's desire to make the grant programs more adaptive to the needs of regional innovation strategies such as clusters and business incubators. For example, the Public Works line item would decrease by \$90 million, but funds targeted for the more flexible Economic Adjustment (EA) designation would increase by \$86 million. An increase of \$3.6 million in Technical Assistance funds would go toward creating an information center for mapping the geography of clusters and the development of a registry aggregating cluster initiatives and programs.

The [National Institute of Standards and Technology \(NIST\)](#) would receive \$918.9 million (7 percent increase). Of this, \$709.3 million (7 percent increase) is directed to NIST's core laboratory research and research facilities; scientific and technical research and services would increase to \$584.5 million (13 percent increase), while construction of research facilities would decrease to \$124.8 million (15 percent decrease). The FY11 request keeps on the path of doubling NIST's laboratory budget by 2017. Other NIST components include:

- [Hollings Manufacturing Extension Partnership \(MEP\)](#) — \$129.7 million (4 percent increase) to enhance the competitiveness of U.S. manufacturers and assist in the development of more efficient manufacturing processes.
- [Technology Innovation Program \(TIP\)](#) — \$79.9 million (14 percent increase) to invest in high-risk, high-reward research that addresses critical national needs and advances innovation.
- [Baldridge National Quality Program](#) — \$9.9 million (2 percent increase) to promote and recognize organizational performance excellence.

The [National Oceanic and Atmospheric Administration \(NOAA\)](#) comprises a majority of the Department's budget, and would receive \$5.55 billion in FY11 (17 percent increase). NOAA's R&D budget would be \$949 million (22 percent increase). Funding requests for key NOAA components include:

- [National Marine Fisheries Service \(NMFS\)](#) — \$908 million (0.4 percent increase) for the management and conservation of living marine resources within the U.S.
- [National Weather Service \(NWS\)](#) — \$902 million (1 percent increase) for weather and flood warnings and forecasts.
- [National Ocean Service \(NOS\)](#) — \$501 million (5 percent increase) for the study and preservation of coastal resources and navigation.
- [Oceanic and Atmospheric Research \(OAR\)](#) — \$454 million (4 percent increase) for research and technology development for the understanding of Earth atmospheric and marine environmental systems.
- [National Environmental Satellite, Data, and Information Service \(NESDIS\)](#) — \$190 million (5 percent decrease) for operating and updating polar-orbiting and geostationary operational orbital satellites.

The [International Trade Administration \(ITA\)](#), responsible for promoting trade and investment and ensuring fair trade and compliance with trade laws, would receive \$534.3 million in FY11 (20 percent increase). These funds would be used to launch the National Export Initiative, a broad federal strategy to increase American exports.

The [National Telecommunications and Information Administration \(NTIA\)](#), responsible for the federal use of spectrum, performing telecommunications research, and advising telecommunications policies, is proposed to receive \$21.8 million in FY11. Proposed to receive zero funding in the previous budget, the NTIA received \$4.7 billion through the Recovery Act of 2009 to develop a national broadband service development and expansion program.

The [U.S. Patent and Trademark Office \(USPTO\)](#) would have full access to its fee collections to sustain its operation thus no discretionary funding would be budgeted for the agency. The USPTO is responsible for examining intellectual property applications, guiding domestic and international IP policy, and delivering IP information worldwide. Total funding for the USPTO would be \$2.32 billion in FY11, an increase from \$1.89 billion from the previous year.

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## Department of Defense

The Administration's FY11 [budget request](#) for the Department of Defense (DOD) is \$708.2 billion (2 percent increase). The full request includes \$548.9 billion (3 percent increase) for the DOD base budget and \$159.3 billion (2 percent decrease) for overseas contingency operations. TBED-related priorities in the proposal include support for mental health and traumatic brain injury research and continued spending of Recovery Act funds on research and development.

Research, Testing, Development and Evaluation (RTD&E) would receive \$71.6 billion (5 percent decrease). RTD&E spending supports defense modernization through basic and applied research, fabrication of technology-demonstration devices, and development and testing of prototypes and full-scale preproduction hardware. This work is performed by contractors, government laboratories and facilities, universities, and nonprofit organizations and includes the bulk of DOD's science and technology programs. A breakdown of DOD RTD&E funding in the FY11 request follows:

**FY11 Budget Request for DOD Research, Testing, Development and Evaluation by Military Branch (in millions of dollars, change for FY10 estimated spending)**

	<b>Army</b>	<b>Navy</b>	<b>Air Force</b>	<b>Defense-Wide</b>
Basic Research	409 (+ 2.8%)	556 (+ 4.9%)	454 (+ 4.4%)	521 (+ 9.2%)
Applied Research	910 (- 34.2%)	681 (- 11.4%)	1,208 (+ 0.8%)	1,773 (- 1.5%)
Advanced Technology Development	791 (- 50.2%)	733 (- 21.8%)	755 (+ 7.9%)	3,432 (- 10.8%)
Demonstration/ Validation	771 (- 24.6%)	3,945 (- 13%)	1,845 (- 17.7%)	7,671 (+ 2.3%)
Engineering and Manufacturing Development	4,919 (+ 19.7%)	6,949 (- 14.3%)	3,758 (- 7.6%)	1,010 (+ 17.6%)
Management Support	1,147 (- 11.5%)	859 (- 32.9%)	1,133 (- 22.1%)	1,223 (- 25.4%)
Operational Systems Development	1,521 (- 13.3%)	4,129 (- 9.7%)	18,750 (+ 1.5%)	5,040 (- 5.6%)
Reimbursable Programs	2,135 (- 42.8%)	607 (- 8.7%)	7,008 (+ 35.9%)	1,729 (- 3.9%)
<b>Total</b>	<b>12,603 (- 17.5%)</b>	<b>18,459 (- 13.7%)</b>	<b>34,122 (+ 4.1%)</b>	<b>22,399 (- 4.8%)</b>

DOD research agencies of interest to the TBED community include:

- [Defense Advanced Research Projects Agency \(DARPA\)](#) — \$3.1 billion (4 percent increase) to fund unique and innovative research through the private sector, academic and other nonprofit organizations as well as government labs.
- [Chemical and Biological Defense Program](#) — \$1.2 billion (1 percent decrease) for research, development, acquisition, fielding and life-cycle support of chemical and biological defense equipment and medical countermeasures.
- [Defense Threat Reduction Agency](#) — \$562.6 million (10 percent increase) to address the entire spectrum of chemical, biological, radiological, nuclear and high yield explosive threats. This allocation includes \$47.4 million for the DTRA Basic Research Initiative.
- [Defense Information Systems Agency](#) — \$272.7 million (18percent increase) to provide command and control capabilities and enterprise infrastructure to continuously operate and assure a global net-centric enterprise in direct support to joint warfighters, national level leaders, and other mission and coalition partners.
- [Defense Logistics Agency](#) — \$101.9 million (49 percent decrease) to combat support agency, providing worldwide logistics support in both peacetime and wartime to the military services as well as several civilian agencies and foreign countries.

No new funding has been requested for the **Defense Experimental Program to Stimulate Competitive Research (DEPSCoR)** (no funding in FY10), or the **Government/Industry Cosponsorship of University Research (GICUR)** program (\$4.7 million in FY10).



Programs recommended for termination in the proposed FY11 budget include **C-17 Transport Aircraft Production** (\$2.5 billion in the enacted FY10 budget), **EP-X Manned Airborne Intelligence, Surveillance and Reconnaissance Aircraft** (\$12 million in FY10), **Joint Strike Fighter Alternate Engine** (\$465 million in FY10), **Navy CG(X) Cruiser** (\$46 million in FY10), **Net Enabled Command Capability** (\$9 million in FY10), and the **Third Generation Infrared Surveillance Program** (\$73 million in FY10).

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## Department of Education

The Administration has requested \$49.7 billion in discretionary funding (excluding Pell Grants) for the [Department of Education budget](#) in FY11 (8 percent increase). A significant majority of the spending request is tied closely to the Administration's goals in the reauthorization of the Elementary and Secondary Education Act, which will not be discussed here.

Four budget items related to science, technology engineering and mathematics (STEM) may be of particular interest to the TBED community:

- [Effective teaching and learning: science, technology, engineering, and mathematics \(STEM\)](#) — \$300 million (66 percent increase) in new competitive grants to states to improve the teaching and learning of STEM subjects. The Mathematics and Science Partnerships Program (\$180 million in FY10) is being consolidated into the new program;
- The proposed **Investing in Innovation (i3) program** includes \$150 million for projects involving science, technology, engineering, and mathematics education — to develop, evaluate, and scale up promising and effective models and interventions with the potential to improve educational outcomes for hundreds of thousands of students.
- \$25 million for a new STEM initiative in the [Fund for the Improvement of Postsecondary Education](#) (FIPSE) to identify and validate more effective approaches for attracting, retaining, and teaching undergraduates in STEM fields that can be brought to scale.
- \$2.3 million for the [Women's Educational Equity](#) program, which gives priority to projects aimed at improving the achievement of women and girls in science and mathematics, with the goal of closing gender gaps in the STEM disciplines and improving the career prospects of women and girls in STEM fields.

The budget proposes to establish a **Workforce innovation fund** of \$30 million to be used to test and validate more effective approaches to achieving positive employment outcomes for program participants, particularly the most vulnerable populations. The Secretaries of Education and Labor (and other agency heads as appropriate) will partner to break down bureaucratic constraints and work together to build and share evidence of what works

Additionally, several significant changes are proposed affecting post-secondary and higher education, including:

[Pell Grants](#) — \$35 billion (29 percent increase) The maximum Pell Award would be \$5,710 up from the current \$5,550, and in future years the maximum Pell Grant would be indexed to the Consumer Price Index, rising each year by the increase in the annual inflation rate plus one percentage point;

[Expanding and modernizing the Perkins Loan program](#) — The Administration supports action by Congress to modernize and expand the Perkins Loan program so more colleges can participate and more students receive access to greater aid. The proposal would increase the total annual loan amounts available to students to \$6 billion from the current \$1 billion beginning in July 1, 2011. Rather than operating through institutional revolving funds, Perkins Loans would be originated and serviced by the Federal Government with loan volume allocated among degree-granting institutions using a method currently being determined in consultation with Congress.

The budget also calls for creating a mandatory funding item to total \$10.6 billion over 10 years for the **President's American Graduation** initiative. The initiative's goal is to strengthen and support community colleges, focus on college completion, and graduate 5 million more students by 2020.

[The Federal Family Education Loan \(FFEL\) program](#) is up for elimination again this year. The Budget proposes to eliminate subsidies to lenders to make loans to students and increase the Department of Education's capacity to make loans directly to students. This proposal would be effective for all loans beginning in the 2010-2011 school year and is expected to save more than \$43 billion over the ten-year budget window.

Other items of interest include:

[Institute of Education Sciences \(IES\)](#) — \$739 million (12 percent increase) funds support programs of research, development and dissemination in areas where knowledge of learning and instruction are inadequate. Included in the budget for IES is \$261 million (30 percent increase) for research, development, and dissemination. Funds support a diverse portfolio of directed research, evaluation studies, research and development centers, and dissemination activities that provide parents, teachers, and schools with scientifically based information on effective educational practice.

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## Department of Energy

The [Department of Energy \(DOE\)](#) budget request for FY11 totals \$28.4 billion (7 percent increase). A key priority for the Department is advancing clean and renewable energy, as evident by the expansion of existing renewable energy research and the introduction of newer energy research and development programs.

The FY11 budget includes a \$300 million request for the [Advanced Research Projects Agency - Energy \(ARPA-E\)](#), its first regular appropriation. Targeting specific high-risk and high-reward transformational energy R&D projects, ARPA-E received no funding in FY10, but attained \$400 million from the 2009 Recovery Act.

The Administration also proposes to spend \$107 million in FY11 on "[Energy Innovation Hubs](#)" spread throughout various DOE offices. These Hubs would collect teams of experts to coordinate work on grand challenges in energy research. A new batteries and energy storage Hub is proposed, joining the FY10 Hubs that are to be focused on fuels from sunlight, energy efficiency in buildings, and nuclear simulation and modeling.

The [Innovative Technology Loan Guarantee Program](#) is proposed to receive \$500 million in credit subsidies in FY11 to promote the construction of renewable energy and energy efficiency projects. DOE also requested \$36 billion in loan guarantees for the nuclear power industry.

The [Office of Science \(SC\)](#) would receive \$5.12 billion (4 percent increase). The Office's Energy Frontier Research Centers (EFRC) is proposed to receive \$140.0 million (40 percent increase), expanding the number of EFRCs awarded in August of 2009.

Some of the Office of Science's ongoing initiatives include:

- [Basic Energy Sciences](#) — \$1.84 billion (12 percent increase) for fundamental basic research to understand and control matter at the electronic, atomic, and molecular levels.
- [High Energy Physics](#) — \$829.0 million (2 percent increase) for particle physics at accelerator facilities, in addition to neutrino detection facilities.
- [Biological and Environmental Research](#) — \$626.9 million (4 percent increase) for research in systems biology, radiochemistry, climate science, and subsurface biogeochemistry.
- [Nuclear Physics](#) — \$562.0 million (5 percent increase) to support core nuclear physics research at 85 academic institutions and 9 DOE national laboratories.
- [Advanced Scientific Computing Research](#) — \$426.0 million (8 percent increase) to develop and deploy the advanced computer capabilities needed by DOE, especially for facilities at Oak Ridge and Argonne National Laboratories.
- [Fusion Sciences](#) — \$380.0 million (11 percent decrease) to understand the scientific foundations needed to develop a fusion energy source.



- [Workforce Development for Teachers and Scientists](#) — \$35.6 million (72 percent increase) to provide a continuum of opportunities to students and teachers of science, technology, engineering and mathematics (STEM).

The DOE is requesting \$912.3 million (5 percent increase) for the [Office of Nuclear Energy \(NE\)](#). The [Generation IV Nuclear Energy Systems Initiative](#) and [Nuclear Power 2010](#) line items were phased out in this budget. Other research programs gaining funds include:

- [Fuel Cycle R&D](#) — \$201.0 million (48 percent increase) for long-term nuclear fuel and waste management research.
- **Reactor Concepts R&D** — \$195.0 million for a new program to support research and development of advanced fission power systems.
- **Nuclear Energy Enabling Technologies** — \$99.3 million for a new line item addressing crosscutting technologies in multiple reactor and fuel cycle research.

The [Office of Energy Efficiency and Renewable Energy \(EERE\)](#) would receive \$2.36 billion (5 percent increase) to conduct research, development, demonstration, and deployment activities in partnership with industry to advance a diverse portfolio of clean power technologies and practices. Individual program activities within the Office include:

- [Vehicle Technologies](#) — \$325.3 million (5 percent increase) for research making passenger and commercial vehicles more efficient and capable of operating on non-petroleum fuels.
- [Solar Energy](#) — \$302.4 million (22 percent increase) to accelerate the commercialization of solar energy technologies, especially for the wide scale deployment of technologies and new solar efforts that can integrate with the existing grid.
- [Building Technologies](#) — \$230.7 million (4 percent increase) for the development of technologies to make new and existing homes and buildings less energy intensive.
- [Biomass and Biorefinery Systems R&D](#) — \$220.0 million (no change) to increase biomass R&D and support for companies that intend to commercialize small biorefineries and validate new biomass conversion technologies.
- [Hydrogen and Fuel Cell Technologies](#) — \$137.0 million (21 percent decrease) for portable, transportation, and stationary applications of fuel cells and hydrogen storage. This line item replaces the [Hydrogen Technology](#) grouping, which attained \$174.0 million in FY10.
- [Wind Energy](#) — \$122.5 million (53 percent increase) to improve the performance and reliability of wind technologies. In FY11, a new offshore wind R&D effort would be initiated to address technical, scaling, environmental, regulatory, and public acceptance risks.
- [Geothermal Energy](#) — \$55.0 million (25 percent increase) for the establishment of enhanced geothermal systems as a major contributor to electricity generation.
- [Water Energy](#) — \$40.5 million (19 percent decrease) to advance marine and hydrokinetic technologies.
- **Regaining our Energy Science and Engineering Edge (RE-ENERGYSE)** — \$50.0 million for a new program to inspire students and workers to pursue careers in science, engineering, and entrepreneurship related to clean energy. An additional \$5 million for this program would come from the Nuclear Energy Office, bringing the total DOE contribution for this initiative to \$55 million in FY11.

The [Office of Energy Delivery and Energy Reliability \(OE\)](#) would receive \$185.9 million for modernizing the electric grid, enhancing the security and reliability of the energy infrastructure, and facilitating recovery from energy disruptions. Within OE, \$144.3 million is designated for research and development (16 percent increase) in the areas of clean energy transmission and reliability, smart grid R&D, energy storage, and cyber security for energy delivery.

While all of the previous mentioned Offices are slated to receive increases in the FY11 budget, the [Office of Fossil Energy \(FE\)](#) would receive \$760.4 million (20 percent decrease). Of this amount, \$586.6 million would be for fossil energy research and development (12 percent decrease). The [Innovations for Existing Plants](#) program request is \$65 million (25 percent increase) and the [Advanced Research](#) program bridging basic and applied coal research would grow to \$8 million (71 percent increase).

The Administration calls for cancellation of an expansion for the Strategic Petroleum Reserve, saving \$71 million. Also slated for termination is the \$50 million ultra-deepwater exploration program. The request calls for cancellation of an additional \$2.7 billion in tax subsidies for oil, coal, and gas industries.

Finally, the Administration has concluded Yucca Mountain in Nevada is not a workable option for long-term storage of hazardous waste; calling for the DOE to discontinue its license for the site.

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## Department of Health and Human Services

The Administration's FY11 [budget request](#) for the Department of Health and Human Services (HHS) is \$880.8 billion (10 percent increase). Mandatory spending for Medicare and Medicaid comprise 84 percent of the HHS Budget — discretionary spending only accounts for about 10 percent of the entire HHS request.

The Office of the National Coordinator for Health Information Technology, responsible for accelerating health IT adoption and electronic health records, would receive \$78 million (28 percent increase). Also highlighted in the HHS Budget in Brief as a priority research concern for the Administration, autism spectrum disorders research and monitoring would receive \$222 million (8 percent increase).

The FY11 budget also would accelerate the advanced development of new medicines, vaccines, and diagnostics for biodefense by investing \$476 million in the [Biomedical Advanced Research and Development Authority](#) (39 percent increase).

### [National Institutes of Health](#)

The FY11 request for National Institutes of Health (NIH) is \$32.2 billion (3 percent increase). All Institutes within NIH would see an increase as a result of the Administration's request.

The [National Cancer Institute](#) (NCI) would receive the greatest budget growth of the Institutes, rising \$162 million (3 percent increase) to \$5.25 billion. NCI's budget would support a range of bold and innovative cancer efforts, including the initiation of 30 new drug trials in FY11. In addition, the request would support the completion of a comprehensive catalog of cancer mutations for the 20 most common malignancies. NIH also plans to pursue comprehensive and innovative approaches to defining the genetic and environmental factors that contribute to autism spectrum disorders and accelerate clinical trials of pharmacological and behavioral interventions by 2016.

In FY11, the [NIH Common Fund](#) (CF) would invest \$562 million (3 percent increase) to support cross-cutting, trans-NIH programs.

All other institutes would see nominal increases ranging between 1 percent and 2 percent. If the FY11 request is provided in full, the NIH estimates 37,001 new & continuing research grants would be funded next fiscal year. NIH estimates 83 percent of funds appropriated would be spent outside of NIH.

The [Agency for Healthcare Research and Quality](#) (AHRQ) request is \$479 million (77 percent increase). The FY11 budget request includes \$286 million (1,261 percent increase from \$21 million in FY10) in Patient-Centered Health Research to continue the work of the \$700 million ARRA fund investment.

The HHS budget request includes \$10.6 billion (1 percent increase) for the [Centers for Disease Control and Prevention](#) (CDC) and the [Agency for Toxic Substances and Disease Registry](#) (ATSDR).

The [Food and Drug Administration](#) (FDA) would receive \$4 billion (23 percent increase).

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## Department of Homeland Security

The Administration's FY11 [budget request](#) for the Department of Homeland Security (DHS) is \$43.5 billion (10 percent increase). The proposed budget includes funding for improving federal cybersecurity efforts and deploying a nationwide network of sensors to detect bio-attacks.

The [DHS Science and Technology \(S&T\) Directorate](#) would receive \$1 billion (1 percent decrease). The directorate ensures DHS and the homeland security community have the science, technical information and capabilities to prevent, protect against, respond to and recover from security threats.

A new division for **Radiological & Nuclear** research is introduced in the proposed budget, reflecting a relocation of alternative technology research related to Helium-3 from the [Domestic Nuclear Detection Office](#) to S&T. The division would receive \$109 million in FY11. All of the other S&T research divisions and offices would receive reduced or steady levels of funding, including:

- [Border and Maritime](#) — \$39.9 million (10 percent decrease) to develop technical capabilities that enhance U.S. border and cargo security;
- [Chemical and Biological](#) — \$200.9 million (3 percent decrease) to increase preparedness against chemical and biological threats;
- [Command Control and Interoperability](#) — \$74.8 million (8 percent decrease) to develop operable and interoperable communications for emergency responders and serve national cybersecurity needs;
- [Explosives](#) — \$120.8 million (no change) to develop technical capabilities to detect, interdict and lessen the impact of non-nuclear explosions caused by terrorist attacks;
- [Human Factors/Behavioral Sciences](#) — \$13.4 million (16 percent decrease) to apply social and behavioral science to homeland security practice; and,
- [Infrastructure and Geophysical](#) — \$36.1 million (52 percent decrease) to increase national preparedness for natural and man-made threats.

Cross-cutting DHS S&T offices include:

- **Innovation** — \$44 million (no change) to manage homeland security priority research and development initiatives that could lead to significant technology breakthroughs. The office oversees the [Homeland Security Advance Research Project Agency \(HSARPA\)](#), which funds basic and applied research projects of value to DHS;
- [Test & Evaluation and Standards](#) — \$23.2 million (20 percent decrease) to provide policy and oversight of the emergency responder equipment and procedures;
- [Transition](#) — \$42.1 million (9 percent decrease) to deliver near-term products and technology enhancements related to homeland security;
- **Research — Laboratory Facilities** - \$122 million (19 percent decrease) for the [Office of National Laboratories](#) to boost homeland security research infrastructure; and,
- [Research - University Programs](#) — \$40 million (19 percent decrease) to engage the academic community to conduct research and to provide education and training programs to enhance homeland security capabilities.

DNDO would receive \$306 million (19 percent decrease) to coordinate federal efforts to detect and protect against nuclear and radiological terrorism. DNDO's Research, Development and Operations budget would be \$207.8 million (36 percent decrease).

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## Department of Housing and Urban Development

The Administration's budget proposal for the [Department of Housing and Urban Development](#) (HUD) is \$41.6 billion in FY11 (5 percent decrease). The Administration's budget provides a total \$48.5 billion in funding to support HUD's core programs and new initiatives, which is offset by estimated collections of \$6.9 billion from credit premiums charged for HUD mortgage insurance and other credit enhancements. Funding for R&D activities under the President's FY11 budget request is more than doubled.

The Community Development Fund would receive \$4.4 billion in FY11 (2 percent decrease), including full funding of \$3.9 billion for [Community Development Block Grants \(CDBG\)](#), the same as last year. A new \$150 million appropriation is requested for new **Catalytic Investment Competition Grants** to implement economic development activities in distressed communities. This program will use CDBG authority, but will provide capital to bring innovative economic development projects to scale to make measurable impact.

Within the Community Development Fund, \$150 million is requested for the [Sustainable Communities Initiative](#) (no change) to improve regional planning efforts that integrate housing and transportation decisions, and increase the capacity to improve land use and zoning. This is a multi-agency partnership in collaboration with the Department of Transportation and the Environmental Protection Agency.

The [Office of Policy Development and Research \(PD&R\)](#) would receive \$87 million in FY11 (58 percent increase). PD&R is responsible for maintaining current information on housing needs, market conditions, and existing programs, as well as conducting research on priority housing and community development issues. Included in this request is \$25 million for **R&D activities** for initiatives tied to the President's national goals of energy, health and sustainability. Partnering with other agencies, HUD would invest in R&D focused on the linkages between the built environment and health, hazard risk reduction and resilience, and the development of innovative building technologies and building processes.

The Administration's budget includes \$25 million (no change) for the **University Community Fund** to promote revitalization in neighborhoods surrounding universities with a renewed emphasis on energy conservation, homeownership, and economic development activities. No funding is requested for the **Rural Innovation Fund** (\$25 million decrease), a program that replaced the former Rural Economic Development and Housing Initiative to improve housing conditions in rural communities.

No new appropriation is requested for the [Empowerment Zone \(EZ\)](#) and [Renewal Community \(RC\)](#) programs in the 2011 budget. These tax incentives were scheduled to expire on Dec. 31, 2010. The Administration supports extension of the EZs and RCs through Dec. 31, 2011.

The 2011 budget also requests no funding for the [Brownfields Economic Development Initiative \(BEDI\)](#) program (\$18 million decrease), a competitive grant program designed to assist cities with redevelopment of brownfield sites for the purpose of economic development and job creation. Budget documents note that the program is relatively small and local governments have access to other public and private funds, including the larger CDBG, which can serve similar purposes.

No new funds are requested for the **Energy Innovation Fund** as it is anticipated that the 2010 appropriation of \$50 million will fund significant pilot program activity through 2011. Established last year, the Fund seeks to provide support for promising local initiatives that can be replicated across the nation and to stimulate and enhance private investment in cost-saving energy efficiency retrofits of existing housing.

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## Department of the Interior

The Administration's FY11 request for the [Department of Interior \(DOI\)](#) is \$12 billion (0.3 percent decrease). R&D activities within DOI are distributed among and cross several offices and are relatively modest in spending, compared to other research-oriented agencies. Highlights include:

The Department's budget includes \$73.3 million (24 percent increase) for the [New Energy Frontier](#) initiative for renewable energy programs. This funding would support development of renewable energy sources on public lands and the outer continental shelf.

The Department of the Interior's [Climate Change Adaptation](#) initiative is an effort to gain effective and broad collaboration to determine the causes, formulate solutions, and implement changes to reduce or reverse climate impacts. The proposed budget seeks \$171.3 million for the initiative (26 percent increase).

The Department's [WaterSMART](#) (Sustain and Manage America's Resources for Tomorrow) sustainability agenda would receive \$72.9 million (100 percent increase) to help mitigate the results of continued overuse of limited water supplies. The increase will allow the Bureau of Reclamation to award more grants for various water related projects including pilot and demonstration projects that showcase the technical and economic viability of treating and using brackish groundwater, seawater, or impaired waters within a specific locale.

The [US Geological Survey](#) (USGS) would receive \$1.134 billion (2% increase). The USGS conducts research, monitoring, and assessments to contribute to understanding the natural world. The largest increase of \$13.4 million is for continuation of Landsat Data Continuity Mission.

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## Department of the Justice

The Administration's [FY11 budget request](#) for the Department of Justice (DOJ) totals \$29.2 billion in discretionary funding (5 percent increase).

The [National Institute of Justice \(NIJ\)](#), which serves as the R&D agency of the DOJ, would receive \$71 million (48 percent increase) for research, evaluation, and demonstration programs. NIJ emphasizes activities in state and local law enforcement, forensic science, crime prevention, violence and victimization, and corrections and courts.

Additional research related funding in the DOJ budget includes:

- \$150 million for the [DNA Initiative](#) (7 percent decrease). This program provides capacity building grants, training, and technical assistance to state and local governments, and supports innovative research on DNA analysis and use of forensic evidence; and,
- \$30 million for the Paul [Coverdell Forensic Science Improvement Grants](#) program (17 percent decrease). This program provides funding to improve the quality and timeliness of forensic science and medical examiner services.

The budget request includes \$438 million (5 percent increase) for programs administered by the [Office on Violence Against Women \(OVW\)](#) to prevent and respond to violence against women and related victims. Included in this appropriation is \$3 million for **research on violence against women** and \$1 million for tracking of **violence against Indian women**, a program that supports comprehensive research on violence against Native American women.

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## Department of the Labor

The Administration's [FY11 budget request](#) for the Department of Labor (DOL) is \$14 billion (2 percent decrease) and includes a \$10 billion reformation of the [Workforce Investment Act \(WIA\)](#), which supports nearly 3,000 One-Stop Career Centers nationwide.

The budget calls for reforms to improve WIA by creating a Workforce Innovation Partnership to streamline service delivery. Leveraging funding from the WIA formula programs, the 2011 budget sets aside \$261 million to establish two new innovation funds, a **Workforce Innovation Fund** and a **Youth Innovation Fund**, that would support and test promising approaches to job training. Through these new innovation funds and WIA reauthorization, the Administration hopes to facilitate regional collaboration and close linkages with employers so that training leads to good jobs.

For training and employment services under the [Employment and Training Administration \(ETA\)](#), the Administration requests \$4 billion in FY11 (16 percent decrease). Included under the ETA are the following services:

- **Dislocated Worker Employment and Training Activities** would receive \$1.4 billion (4 percent increase) to provide reemployment services and retraining assistance to individuals dislocated from their employment. The 2011 budget directs 5 percent of total funding to the proposed Workforce Innovation Fund to support and test "learn and earn" strategies such as apprenticeships and on-the-job training.
- **Youth Activities** would receive \$1.1 billion (8 percent increase) to support a wide range of activities and services to prepare low-income youth for academic and employment success, including summer jobs. The 2011 budget directs 15 percent of total funding to the proposed Youth Innovation Fund to pilot innovative models for delivering summer and year-round work experiences and comprehensive services to disconnected youth.
- **Adult Employment and Training Activities** would receive \$887 million (3 percent increase) to provide financial assistance to states and territories to design and operate training and employment assistance programs for adults. The 2011 budget directs 5 percent of these funds to the proposed Workforce Innovation Fund.
- **High Growth Job Training Initiative** would receive \$125 million (no change) to prepare workers for jobs in high-growth fields such as health care, information technology, and advanced manufacturing.
- **Green Jobs Innovation Fund** would receive \$85 million (112 percent increase) for competitive grant opportunities to help workers receive job training in green industry sectors and occupations, and access green career pathways.
- **The Career Pathways/Community College in FY2010** program would receive \$56 million (53 percent decrease). Formerly the [Community-Based Job Training Grant Program](#), this program provides grants to community colleges for those pursuing careers in high-demand and emerging industries.
- The **Data Quality Initiative** would receive \$13 million (62 percent increase) to support development of longitudinal data systems that integrate education and workforce data.

The [Office of Job Corps](#) would receive \$1.7 billion (no change) to provide intensive educational and career technical training for youth. Budget documents note that the Consolidated Appropriations Act 2010 accepted the Administration's proposal to transfer the Job Corps program and its administrative funding from the Office of the Secretary back to the ETA to better coordinate the program with other employment and training programs administered by ETA.

[The Bureau of Labor Statistics \(BLS\)](#) would receive \$645 million (6 percent increase). The BLS concentrates its statistical activities in labor force, price and cost of living, compensation and working conditions, and productivity and technology trends.

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## Department of the Transportation

The Administration's FY11 Department of Transportation (DOT) [budget request](#) totals \$79 billion (2 percent increase). The request targets the Administration's three key transportation priorities:

- improving transportation safety;
- investing for the future; and,
- promoting livable communities.

The Department's budget includes \$1 billion (60 percent decrease) for the [High Speed Rail program](#) to continue the implementation of the President's vision of a high speed rail for America.



The Federal Aviation Administration's (FAA) total request is \$16.5 billion (3 percent increase) for FY 2011.

- \$1.1 billion (a 32 percent increase) is included for FAA's [NextGen](#) initiative to implement the NextGen air traffic control system.
- The request for FAA research, engineering and development is \$190 million (0.5 percent decrease). Funding will support efforts to improve aviation safety, aviation efficiency, and to reduce the impacts of aviation on the environment.

The FY11 budget request of \$17 million for the [Research and Innovative Technology Administration](#) (31 percent increase) will be used, in part, to fund system operation and maintenance and equipment recapitalization of the Nationwide Differential Global Positioning System.

The [Federal Railroad Administration \(FRA\)](#) budget request for R&D is \$40 million (5 percent increase) providing science and technology support for FRA's rail safety rulemaking and enforcement efforts. It also stimulates technological advances in conventional and high speed railroads.

The Research and University Research Centers budget request is \$59 million (24 percent decrease). The funds have been integrated into National Research and Technology.

Under the [Federal Highway Administration](#), \$429.8 million (no change) is requested for implementation or execution of programs for transportation research. The budget allocation is part of the Highway Trust Fund.

For the [Office of the Secretary](#), \$10 million (44 percent decrease) is requested for Transportation Planning, Research and Development Activities supporting the development of transportation policy, coordination of national-level transportation planning, and such issues as regulatory modernization, energy conservation, and environmental and safety impacts of transportation.

The [National Highway Traffic Safety Administration](#) budget request includes \$133 million (5 percent decrease) for Vehicle Safety Research. These programs support vehicle safety activities to reduce highway fatalities, prevent injuries, and reduce their associated economic toll.

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## Department of the Treasury

The Administration's FY11 Department of Treasury [budget request](#) is \$17 billion (9 percent increase), including \$13.9 billion (4 percent increase) for domestic programs and \$3.1 billion (44 percent increase) for international programs. Treasury priorities for FY11 include support of lending institutions in underserved communities and new enforcement initiatives to improve collection of tax revenues.

Treasury's [Community Development Financial Institutions Fund](#) (CDFI Fund) would receive \$250 million (1 percent increase) to expand the capacity of financial institutions to provide credit, capital and financial services to underserved populations and communities in the U.S. The fund's [CDFI program](#), which builds the capacity of CDFIs to support economic and community development, would receive \$140 million (30 percent increase). The agency request states that the CDFI program would expand its Capacity Business Initiative to make new, specialized technical assistance and training available to CDFIs nationwide. Funding for [Native Initiatives](#), which works with CDFIs servicing native communities, would continue at \$12 million (no change).

Two new initiatives would be introduced through the CDFI Fund in FY11. The new **Bank on USA Initiative** would promote access to affordable and appropriate financial services and basic consumer credit products for unserved households. The initiative would receive \$50 million in FY11. The **Healthy Food Financing Initiative** would receive \$25 million to support efforts at CDFIs to increase the availability of healthy foods in underserved urban and rural areas.

Four current CDFI Fund programs would receive no funding under the proposed budget. The [Capital Magnet Fund](#), which was introduced in FY10 to provide financing for the development, preservation, rehabilitation and purchase of affordable housing or economic development programs would not be funded. Last year, the program received \$80 million in the FY10 enacted budget. No funding is allotted for the [Bank Enterprise Awards](#) program, which received \$25 million last year to support institutions that finance community and economic development. Funding also is proposed to be eliminated for [Financial Education and Counseling](#) and a separate program to provide education and counseling in Hawaii.

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## Environmental Protection Agency

The Administration FY11 [budget request](#) for the Environmental Protection Agency (EPA) of \$10 billion reflects level funding from FY10.

For **Science and Technology**, including R&D activities, the Administration recommends \$846.7 million (a 0.1 percent increase). Science and Technology programs include:

- [Clean Air and Global Climate Change](#) — \$246 million (0.4 percent increase) to protect and improve the air. EPA would conduct a range of science and technology activities, including research on criteria air pollutants to develop the scientific basis for EPA's national ambient air quality standards and research on the effects to human health of toxic air pollutants.
- [Clean and Safe Water](#) — \$154 million (3 percent decrease) to ensure drinking water is safe. EPA would conduct research to support development of water quality and safe drinking water standards and research to manage risks associated with potential impacts of geologic sequestration of carbon dioxide on underground sources of drinking water.
- [Land Preservation and Restoration](#) — \$35 million (6 percent increase) to preserve and restore the land. EPA would conduct research to provide improved methods for site characterization, risk assessment and exposure analysis, mitigation approaches, compatibility with biofuels and multimedia modeling.
- [Healthy Communities and Ecosystems](#) — \$349 million (4 percent increase) to conduct research to adequately protect or restore the health of communities and ecosystems using integrated and comprehensive approaches and partnerships.
- [Compliance and Environmental Stewardship](#) — \$39 million (5 percent decrease) to improve environmental performance through compliance with environmental requirements. EPA would conduct research on decision support tools, sustainability metrics, and new technology development.

R&D initiatives would receive increased funding under the Administration's budget, including:

- The [Science to Achieve Results \(STAR\)](#), which supports extramural research in environmental science and engineering, would receive \$87.2 million (42 percent increase) to support research in key areas in support of the Administration's priorities, including hydraulic fracturing, endocrine disruptors, green infrastructure, air quality, and research fellowships. Through [STAR Fellowships](#), EPA supports the Science, Technology, Engineering, and Mathematics (STEM) government-wide initiative.
- For [Computational Toxicology](#), the Administration requests \$21.9 million (10 percent increase). The increased funding would be directed toward next-generation tools to speed and facilitate implementation of the agency's Endocrine Disruptor Screening Program.

In support of climate change initiatives, the Administration requests \$56 million, including \$46 million in new funding, for the EPA and states to address climate change effectively through regulatory initiatives to control greenhouse gas emissions. An additional \$21 million (24 percent increase) would be available to implement the [Mandatory Greenhouse Gas Reporting Rule](#). Other key climate change investments include:

- \$55.5 million (4 percent increase) for Energy Efficiency/[ENERGY STAR](#) to expand the ENERGY STAR program across the residential, commercial, and industrial sectors.
- \$7.1 million (77.1 percent increase) to analyze the applicability of Clean Air Act Authority, and conduct further analysis related to [carbon capture and sequestration](#).
- \$2 million (100 percent increase) for **Renewable Fuel Storage** to assess the Underground Storage Tank compatibility with alternative fuels.

The Administration's budget seeks to eliminate funding for [Local Government Climate Change Grants](#) (\$10 million decrease) because it duplicates more substantial greenhouse gas emission reduction programs across the federal government and lacks guidance, defined outcomes, and an effective means of targeting funds, according to budget documents.

The FY11 budget request includes \$3.3 billion (6 percent decrease) for Clean Water programs. For the [Clean Water State Revolving Fund](#), the Administration requests \$2 billion (5 percent decrease). For the [Drinking Water State Revolving Fund](#), the Administration requests \$1.3 billion (7 percent decrease). These programs provide grants to states to capitalize on their own revolving funds, which finance wastewater and drinking water treatment systems.

To continue the [Great Lakes Restoration Initiative](#), a program established last year to advance Great Lakes protection and restoration, the Administration requests \$300 million (37 percent decrease). In FY11, EPA is increasing relative funding for the invasive species focus area, while funding has been reduced to reflect the ramp-up period, allowing time for the program to absorb the initial influx of FY10 resources, budget documents note. Additional clean water investments include \$63 million (26 percent increase) for [Chesapeake Bay](#) restoration and a new request of \$16.8 million for the [Mississippi River Basin Initiative](#) to address nutrient pollution in partnership with USDA.

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## NASA

The Administration's FY11 NASA [budget request](#) totals \$19 billion (1 percent increase). One of the most publicized budget casualties would be the [Constellation](#) program, the program to return astronauts to the moon. Considering the findings of the Review of [U.S. Human Space Flight Plans Committee](#), chaired by Norm Augustine, the program was jettisoned in favor of private industry investments to foster a fledgling private-sector space industry. Up to \$1.9 billion in FY11 and \$600 million in FY12 is budgeted to cancel Constellation contracts and close or repurpose facilities.

NASA's new five-year plan calls for more than \$13 billion of investment in three proposed programs within the Exploration Directorate that are expected to help support the transition to a public/private partnership for space travel. A total of \$1.336 billion is requested in FY11 alone for the three new initiatives;

- The \$652 million **technology demonstration program** would demonstrate critical technologies such as in-orbit propellant transfer and storage, inflatable modules, automated/autonomous rendezvous and docking, closed-loop life support systems, in-situ resource utilization and advanced in-space propulsion, other next-generation capabilities;
- The \$559 million **heavy-lift propulsion** would provide grants and contracts to investigate a broad scope of R&D activities to support next-generation space launch propulsion technologies; and,
- Up to \$125 million for **robotic precursor** missions to the Moon, Mars and its moons, Lagrange points, moons, points, and nearby asteroids to scout targets for future human activities, and to identify the hazards and resources that will determine the future course of the expansion of human civilization into space.

Total NASA funding is distributed amongst seven directorates and offices including:

- **Space Operations** — \$4.88 billion (21 percent decrease) to support the Space Shuttle, [International Space Station](#) (ISS) and Space and Flight Support systems. The [Shuttle](#) budget sees the most significant reduction to \$989 million (68 percent decrease) specifically directed for successful mission completion and retirement of the Space Shuttle as proscribed. With the Shuttle retirement, more robust investments are directed at the ISS to extend its mission from 2016 to 2020 or beyond.
- **Science** — \$5.01 billion (12 percent increase) to support earth science, planetary science, astrophysics and heliophysics; specific emphasis on earth science relating to climate change increases by \$382 million from FY10.
- **Exploration** — \$4.26 billion (13 percent increase) with significant investment planned for the three new R&D programs mentioned above.
- **Cross-Agency Support** — \$3.1 billion (3 percent increase) for Center and Agency Management and Operations as well as environmental compliance and restoration. Directed funds like the Innovative Partnerships Program, SBIR and STTR, have been moved from CAS to Space Technology in the FY11 budget.
- **Aeronautics & Space Research & Technology** — \$1.15 billion total with \$579 million for aeronautics and \$572 million for Space Research and Technology including [IPP](#), [SBIR](#), and [STTR](#).
- **Education** — \$146 million (27 percent decrease) dedicated to improving science, technology, engineering and mathematics (STEM) at all education levels.
- **Inspector General** — \$37 million (2 percent increase) to prevent and detect crime, fraud, waste, abuse and mismanagement within the agency.

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## National Science Foundation

The Administration's FY11 discretionary [budget request](#) for the National Science Foundation (NSF) is \$7.42 billion (8 percent increase). Of the amount, \$4.67 billion is designated for basic research, \$435.4 million for applied research, \$443.5 million for R&D facilities and equipment, and \$973.5 million for education and training.

FY11 budget requests for initiatives that cross several NSF directorates include:

- **Networking and Information Technology Research and Development (NITRD)** — \$1.17 billion (7 percent increase) to support large scale networking, cybersecurity, high confidence software and systems, human-computer interaction, and software productivity.
- **Science, Engineering, and Education for Sustainability (SEES)** — a \$765.5 million (16 percent increase of \$104.8 million) portfolio of research initiatives including climate and energy science and engineering programs collected to inform societal actions that lead to environmental and economic sustainability.
- **Homeland Security Activities** — \$405.3 million (4 percent increase) for protecting critical infrastructure and defending against threats by research in cybersecurity, emergency planning, and risk

management.

- [National Nanotechnology Initiative \(NNI\)](#) — \$401.3 million (4 percent decrease) contribution by the NSF in an effort to coordinate nanotech efforts across 25 federal departments and agencies. Nanomanufacturing and Environmental, Health and Safety research will see increases.
- [U.S. Global Change Research Program \(USGCRP\)](#) — \$369.9 million (16 percent increase) to advance basic research, integrative modeling, and product development for decision makers in the fields of climate change and evolving ecosystems.
- [The Faculty Early Career Development Program \(CAREER\)](#) — \$209.2 million (6 percent increase) to support junior faculty who exemplify the role of teacher-scholars through outstanding research and excellent education.
- **Science and Engineering Beyond Moore's Law (SEBML)** — \$70.2 million (50 percent increase) to position the U.S. at the forefront of communications and computational capability beyond the physical and conceptual limitations of current technologies.
- **Cyberlearning Transforming Education (CTE)** — \$41.3 million for a new multidisciplinary research program to bring advanced technologies to students of all education levels and identify the innovations that lead the most promise in the promotion of learning.

### NSF Centers Programs

Funding for NSF's centers programs, supported additionally by many state TBED programs, are the principal means by which NSF fosters interdisciplinary research. The FY11 budget request for these centers is \$313.8 million (9 percent increase).

- [Engineering Research Centers \(ERCs\)](#) — \$67.5 million (23 percent increase) for 18 funded partnerships involving academe, industry and NSF for development of next-generation advances in complex engineered systems.
- [Science and Technology Centers](#) — \$66.0 million (14 percent increase) to support partnerships involving academia, industry, government laboratories, and other public and private organizations.
- [Materials Research Science & Engineering Centers](#) — \$63.0 million (11 percent increase) expected to support 25 centers performing interdisciplinary materials research in academic institutions across the country.
- [Nanoscale Science and Engineering Centers](#) — \$40.2 million (13 percent decrease) for multidisciplinary research to advance the development of ultra-small technology in electronics, materials, medicine, environmental science and other fields. It is expected 19 of these centers would be funded in FY11.
- [Science of Learning Centers](#) — \$25.8 million (no change) to continue support for multidisciplinary, multi-institutional centers to advanced understanding of learning and its societal implications. Six centers would be funded in FY11.
- [Centers for Chemical Innovation](#) — \$28.0 million (17 percent increase) to support long-term "big questions" in basic chemical research. Twelve Phase I and six Phase II centers would be funded in FY11.
- [Centers for Analysis and Synthesis](#) — \$23.3 million (2 percent increase) to continue development of new tools and standards for management of biological information and to support data analysis capabilities across the biological sciences. Four of these centers would be funded in FY11.

## Engineering Directorate

The FY11 budget request for the [Directorate for Engineering \(ENG\)](#) is \$825.7 million (11 percent increase), which provides 35 percent of the total federal support for university-based, fundamental engineering research. Highlights include:

- [Partnerships for Innovation](#) — \$19.2 million (109 percent increase) to bring together colleges and universities, state and local governments, the private sector, and nonprofit organizations. The proposal includes a new "Innovation Ecosystem" initiative, aiming to increase community-university entrepreneurship and commercialization partnerships within a region.
- [SBIR/STTR programs](#) — \$142.9 million (14 percent increase) to support innovation research conducted by small technology firms.
- [Office of Emerging Frontiers in Research and Innovation \(EFRI\)](#) — \$31.0 million (7 percent increase) to help NSF focus on emerging areas in a timely manner. EFRI recommends, prioritizes, and funds interdisciplinary initiatives at the emerging frontier of engineering research and education.
- [Industry/University Cooperative Research Centers \(I/UCRCs\)](#) — \$7.85 million (no change) to further develop long-term partnerships among industry, academe and government.

## Biological Sciences Directorate

The FY11 budget request for the [Biological Science Directorate \(BIO\)](#) is \$767.8 million (8 percent increase). The Directorate's [Emerging Frontiers](#) division would receive \$106.2 million in allocations (3 percent increase) to identify, incubate, and support infrastructure and research areas that transcend scientific disciplines and/or advance the conceptual foundations of biology.

## Integrated Activities

Within Integrated Activities (IA), [Experimental Program to Stimulate Competitive Research \(EPSCoR\)](#) is proposed to receive \$154.4 million for FY11 (5 percent increase) to promote the development of eligible states' science and technology resources through partnerships involving a state's universities, industry, government and the federal R&D enterprise. EPSCoR composes just over half of Integrated Activities' discretionary funds.

A new \$400,000 effort described in the FY11 budget is the **Science and Technology in America's Reinvestment — Measuring the Effect of Research on Innovation, Competitiveness, and Science** (STAR METRICS) project, to assess the impacts of federal science and technology investments.

## Education and Human Resources Directorate

In the FY11 budget, the [Education and Human Resources \(EHR\) Directorate](#) is proposed to receive \$892.0 million (2 percent). EHR highlights include:

- [Graduate Research Fellowships \(GRF\)](#) — \$158.2 million (16 percent increase) to support science, mathematics, and engineering students in graduate school.
- **Comprehensive Broadening Participation of Undergraduates in STEM** — \$103.1 for a new program that consolidates the Historically Black Colleges and Universities Undergraduate Program, the Louis Stokes Alliances for Minority Participation, and the Tribal Colleges and Universities Program and realigns them to promote STEM in minority populations.
- [Advanced Technological Education \(ATE\)](#) — \$64.0 million (no change) to educate technicians in various fields involving alternative energy. The Administration desires to have this program grow to \$100 million by FY13.
- [Math and Science Partnership \(MSP\)](#) — \$58.2 million (no change) to improve student outcomes in math and science for all students in grades K-12 through partnerships with higher education.
- [Robert Joyce Scholarship Program](#) — \$55.0 million (no change) to encourage talented STEM undergraduate students and postgraduate professionals to become K-12 mathematics and science teachers.
- [Graduate STEM Fellows in K -12 Education \(GK-12\)](#) — \$48.2 million (2 percent decrease) to enable graduate students in NSF-supported STEM disciplines to acquire skills that will prepare them for professional and scientific careers. A total of 875 fellows would be supported by this program in FY11.



- [Integrative Graduate Education and Research Training \(IGERT\)](#) — \$29.5 million (1 percent decrease) to prepare U.S. doctoral students for advancing knowledge in emerging areas of research and to pursue successful careers in academia, industry or the public sector.
- **Climate Change Education Program** — \$5.5 million (no change) to increase the knowledge of the science of climate change in formal and informal learning settings.

Finally, the programs of GRF, GK-12, IGERT, and ATE from the list above will dedicate 5 percent of its allocations to specific awards in the energy-related fields.

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## Regional Commissions and Authorities

Funding for three of four federally established commissions and authorities is included in the Administration's FY11 budget request. The commissions are dedicated to improving the economic opportunities with specific geographic regions.

The Appalachian Regional Commission, Delta Regional Authority and Denali Commission are dependent on annual appropriations. The Tennessee Valley Authority (TVA), the oldest and largest of the four entities, generates its budget primarily through power generation revenues. TVA still requires the government to set its annual spending level.

- [Appalachian Regional Commission \(ARC\)](#) — \$76.0 million (no change) to assist the 13-state, 420-county Appalachian Region in achieving socioeconomic parity with the nation. ARC works with 73 multi-county local development districts to implement economic development strategies. In FY11, \$10 million of its funds would be dedicated to promoting sustainable growth and employment.
- [Delta Regional Authority \(DRA\)](#) — \$13.0 million (no change) to assist an eight-state, 252-county region around the Mississippi Delta in obtaining transportation and basic public infrastructure, skill training, and opportunities for economic development. In FY11, DRA would focus on multi-state planning and the facilitation of regional investments.
- [Denali Commission](#) — \$12.0 million (77 percent decrease) to provide infrastructure development, job training and other economic development services in rural Alaska. The FY11 budget proposes to add a 50 percent matching requirement to the Commission's funding and construction projects, lowered to a 20 percent match for distressed communities.
- [Tennessee Valley Authority](#) — \$13.0 billion (9 percent increase) to assist the TVA, a government-owned corporation established in 1933 for the unified development of a river basin comprised of parts of seven states. TVA operates a series of 49 dams and 47 reservoirs to reduce the risk of flooding, enable year-round navigation, supply affordable and reliable electricity, improve water quality and supply, provide recreational opportunities, and stimulate economic growth.

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## Small Business Administration

The FY11 [budget request](#) for the Small Business Administration (SBA) is \$994 million (21 percent increase).

The budget request calls for \$165 million in subsidy costs to support \$17.5 billion in 7(a) loan guarantees. This includes \$16 billion in term loans and \$1.5 billion in revolving lines of credit. The budget also includes \$3 billion in **Small Business Investment Company** (SBIC) debentures to support new businesses through early-stage and mezzanine small business financing.

The budget also includes proposals to increase the size of various financing mechanisms, including: increasing the maximum 7(a) loan size from \$2 million to \$5 million; and, increasing the maximum **Certified Development Company** (or "504") loan size from \$2 million to \$5 million for regular projects and from \$4 million to \$5.5 million for manufacturing projects.

Funding requested for three larger technical assistance programs includes:

- [Small Business Development Centers](#) (SBDC) — \$130 million to provide half or less of the operating funds of the lead SBDCs and their satellite organizations that make up a network of more than 1,100 service locations around the country;
- [Women's Business Centers](#) (WBC) — \$14 million to support a national network of nearly 100 resource centers located throughout the U.S. to promote the growth of women-owned-businesses; and,
- [SCORE](#) — \$7 million to support about 370 chapters, a mentoring program involving retired executives.

Other programs of interest include:

- [Small Business Innovation Research](#) program — \$2 million to improve data collection for the SBIR program. These funds will support the high-priority performance goal of collecting best practices in innovation and commercialization, while strengthening program oversight and refining performance metrics,
- **The Emerging Leaders initiative** — \$3 million for intensive technical assistance to companies that have high growth potential and are located in distressed economic areas, such as inner cities and Native American communities, and connect them to regional business networks to accelerate growth.
- **Regional Innovation Clusters** — \$11 million to support enhanced small business participation in regional economic clusters by awarding competitive grants to facilitate greater coordination of resources (business counseling, training, mentor-protégé partnerships).

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