

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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March 9, 2012

The Honorable Paul Ryan
Chairman
Committee on the Budget
207 Cannon House Office Building
Washington, DC 20515

Dear Chairman Ryan:

Pursuant to the provisions of clause 4(f) of House Rule X of the Rules of the House of Representatives for the 112th Congress and Section 301(d) of the Congressional Budget Act of 1974, as amended, I am transmitting the Views and Estimates, including Additional and Minority Views, of the Committee on Science, Space, and Technology for Fiscal Year 2013.

Sincerely,



Ralph M. Hall
Chairman
Committee on Science, Space, and Technology

Enclosure

cc: The Hon. Chris Van Hollen, Ranking Member, Committee on the Budget
The Hon. Eddie Bernice Johnson, Ranking Member, Committee on Science,
Space, and Technology

**VIEWS AND ESTIMATES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
FISCAL YEAR 2013**

President Obama transmitted his budget request for Fiscal Year 2013 (FY13) to Congress on February 13, 2012. The President proposes \$37.9 billion in FY13 for all non-defense and non-health specific research and development, an 8.7 percent increase over the FY12 spending level. This amount includes basic and applied research, development, and facilities and equipment.

The Committee on Science, Space, and Technology supports the funding of basic research and development activities and believes that wise investments, coupled with favorable tax cuts and reduced regulations, can lead to economic growth, new jobs, and innovation. However, the Committee is mindful that in order to realize gains on investment, the Nation needs to be on a sound economic footing. We remain in a challenging economic environment. The Congressional Budget Office estimates that Federal spending will exceed \$3.6 trillion or 23.2 percent of GDP this year and while slightly less than last year, it remains elevated by historical standards. We are running a deficit of \$1.3 trillion and our gross Federal debt now exceeds \$15 trillion. Not only are these levels truly unsustainable, but the Administration ignores the crisis in the FY13 Budget Request. This budget would increase the gross national debt by \$11 trillion over ten years to \$26 trillion in 2022. Congress, and this Committee, must address this challenge by reducing spending further and finding ways to cut unnecessary, duplicative, and wasteful programs so that we deliver the most efficient and effective programs for the country.

The following are the views of the Committee on Science, Space, and Technology on the budget for programs within the Committee's jurisdiction.

National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration is our Nation's primary civilian space and aeronautics research and development agency, planning and executing missions that increase our understanding of Earth, the solar system, and the universe. NASA operates the International Space Station, a fleet of satellites throughout our solar system, Mars rovers, and a small number of research aircraft. It carries out our Nation's largest portfolio of civil aeronautics research and development projects, helping to ensure that our national airspace system and aerospace industry remain the world's safest and most efficient. NASA also undertakes activities in technology development and transfer, education, outreach, and participates in a number of interagency activities such as the Next Generation Air Transportation System, information technology, and climate change research.

A notable event occurred last year that distinguishes the FY13 NASA budget request from submissions sent up during the previous three decades. On July 21, 2011, NASA retired the Shuttle program with the landing of STS-135, Shuttle *Atlantis*, bringing to an end a 30-year reign of American dominance in human space flight. The United States currently has no domestic

capability to ferry astronauts to and from the International Space Station. NASA is working now on developing two follow-on systems that will be discussed below in further detail.

The Committee supports NASA's FY13 budget request of \$17.7 billion, which is \$58 million less (0.3 percent reduction) than appropriated amounts for FY12. In FY11, NASA received \$18.4 billion; and in FY10, the agency was funded at \$18.7 billion. For FY13, NASA is authorized to receive \$19.9 billion.

NASA has articulated three agency priorities that are reflected in its budget request: (1) completing the James Webb Space Telescope; (2) operating the International Space Station (ISS), including development of commercial cargo and crew capabilities to sustain ISS; and (3) building the Space Launch System to enable future manned space flight missions into deep space.

The budget request for NASA's Science Mission Directorate is \$4.91 billion, which is \$162.5 million less than FY12. The Mars Exploration Program sees a precipitous drop in funding, going from \$587 million in FY12 to \$360.8 million for FY13. The proposed budget effectively ends the planned joint European Space Agency (ESA) - NASA 2016 and 2018 Mars missions. While the Committee understands that the tremendous budgetary pressures faced by NASA must be met with prudent and tough decisions, the Committee is concerned that these plans will result in the loss of uniquely U.S. capabilities, particularly for entry, descent and landing that will be necessary for future robotic and human exploration. Furthermore, the Committee is concerned about how this decision may affect our ability to develop mutually beneficial international partnerships in the future. According to NASA, efforts are already underway to re-plan a less expensive Mars Exploration program with the goal of delivering a new architecture to Congress in spring 2012. The Committee is concerned that NASA's re-plan will come too late to inform the appropriations process and, due to the short time span in which it will be performed, is unlikely to yield any recommendations that are superior to the current well-vetted program.

As expected, the James Webb Space Telescope (JWST) receives a generous increase to reflect the newly established baseline targeting a launch date of October 2018. This resulted from a lengthy re-plan process completed by NASA last year after experiencing extensive cost and schedule overruns. Per the re-plan, JWST would receive \$627.6 million in FY13, an increase of over 20 percent when compared to the FY12 estimate of \$518.6 million. The Committee will continue to provide thorough oversight to ensure the program remains on track and within budget.

Last year, the Committee noted with concern planned increases to Earth Science programs, particularly given the tight fiscal environment. We are pleased to see a more tempered approach; the budget reflects increasing launch costs and delays development of new missions.

Regarding the science portfolio at NASA in general, the Committee notes that several missions now in development are threatened with significant cost growth primarily due to increasing launch vehicle costs. We will continue to monitor this and seek innovative solutions to ensure our future earth and space science programs are not sidelined by escalating launch costs.

The budget request for the Aeronautics Research Mission Directorate (ARMD) is a 3.1 percent reduction in funding, dropping from \$569.4 million in FY12 to \$551.5 million in FY13. ARMD continues support in cutting-edge research to improve aviation safety, efficiency and air traffic management. Of particular note, hypersonic research has been combined with supersonic research and responsibility for “entry, descent and landing” (EDL) research has been transferred to the Space Technology account. The transfer of EDL research accounts for a significant amount of the ARMD funding reduction in FY13. The Committee is concerned that reductions in hypersonic research will negatively impact and delay game changing technology development for future rocket propulsion systems.

With regard to human space flight, the NASA Authorization Act directed the Agency to prioritize development of the Space Launch System (SLS) and Multi Purpose Crew Vehicle (MPCV) to replace the Space Shuttle, which was retired in 2011. The Act also authorized NASA to continue activities related to development of a commercial crew launch system, but articulated Congressional intent that NASA develop the SLS and MPCV as soon as possible to ensure U.S. backup access to the ISS in case commercial crew or cargo capabilities fail to materialize. NASA’s FY13 budget proposes to reverse the priorities established by Congress in both authorization and appropriation legislation. NASA seeks to reduce funding for the continued development of the SLS by 11 percent or \$162 million below FY12 levels to \$1.34 billion, and reduce funding for the Orion MPCV by 14.6 percent or \$175 million from FY12 levels to \$1.02 billion. Under this budget proposal, the SLS/MPCV system will not be operational until 2021, one year after the current ISS program is due to expire. The Committee finds it unacceptable for the U.S. to rely on the Russian Soyuz system for the remainder of the ISS program and believes NASA should give higher priority to the SLS and MPCV programs.

For Commercial Crew Development activities, NASA’s FY13 budget proposal diverges from previous Congressional direction by requesting \$830 million, which is \$424 million or 104 percent above the FY12 appropriated level and \$330 million (66 percent) more than the FY13 authorization of \$500 million.

The FY13 budget also includes increased funding for Space Technology development. The FY13 request seeks \$699 million, an increase of \$125.3 million or 21.8 percent above FY12 levels. The Committee supports this endeavor generally, but believes this level of increase is not warranted.

National Science Foundation (NSF)

The National Science Foundation (NSF) provides over 20 percent of federal support for all basic research at U.S. colleges and universities and is second only to the National Institutes of Health (NIH) in support for all academic research. It is the primary source of federal funding for non-medical basic research, providing approximately 40 percent of all federal support, and serves as a catalyst for science, technology, engineering, and mathematics (STEM) education improvement at all levels of education. It supports the fundamental investigations that ultimately serve as the foundation for progress in nationally significant areas such as national security, technology-driven economic growth, energy independence, health care, nanotechnology, and networking and information technology.

The FY13 budget request for NSF is \$7.4 billion, a 4.8 percent increase over the FY12 level. The Committee recognizes the importance of making appropriate investments in science, space, and technology basic research, development, and STEM education in order for the United States to remain a world leader in competitiveness and innovation. However, while supporting a healthy budget request for NSF, the Committee remains concerned that the levels requested exceed what is fiscally responsible in the current economic climate. Further, new and expanded Administration priorities continue to seriously divert precious research and development (R&D) funds from other worthy endeavors.

The Committee applauds the Administration's \$67 million in cuts and consolidations, but regrets that it did not go further in identifying additional areas for significant savings to the American taxpayer. This additional savings could go a long way in helping to protect the integrity of the Nation's essential basic R&D portfolio.

Research and Related Activities (RRA)

The FY13 budget request includes over \$5.9 billion for Research and Related Activities (RRA) an increase of \$294 million or 5.2 percent over FY12. Beginning in FY13, NSF plans to enable seamless operations across organizational and disciplinary boundaries through a new OneNSF Framework. The OneNSF Framework encompasses a set of currently funded investments to "create new knowledge, stimulate discovery, address complex societal problems, and promote national prosperity."¹ OneNSF Framework priorities for FY13 include: \$257 million for Cyber-Enabled Materials, Manufacturing, and Smart Systems (CEMMSS) to transform static systems and processes into adaptive "smart" systems; \$106 million for Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) to address the science-driven integration of cyberinfrastructure; \$49 million for Expedition in Education (E²) to establish a partnership with the research directorates and the Education and Human Resources directorate to integrate and expand STEM education research; \$19 million for NSF Innovation Corps (I-Corps) to assess opportunities to transition emerging technologies into new products; \$63 million for Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) to integrate existing interdisciplinary investments with new Foundation-wide activities; and \$110 million for Secure and Trustworthy Cyberspace (SaTC) to align Foundation investments with the national cybersecurity strategy.

OneNSF Framework priorities also incorporate the existing Science, Engineering and Education for Sustainability (SEES) program, which crosses all NSF directorates and has a goal of advancing "climate and energy science, engineering, and education to inform the societal actions needed for environment and economic sustainability and sustainable human well-being." The FY13 budget request for SEES is \$202.5 million, an increase of \$45.5 million or 29 percent over the FY12 estimate. When compared to the FY12 budget request of \$998.19 million, the SEES portfolio request appears to have shrunk dramatically. The FY12 request estimated spending on SEES for FY11 to be \$660.74 million; the FY13 request reflects FY11 actual spending to be \$87.96 million or \$572.78 million less than reported in the previous year. The Committee is greatly concerned that the Foundation continues to fund activities that "advance climate and

¹ FY13 NSF Budget Request to Congress, p. 3.

energy science, engineering, and education to inform the societal actions needed for environmental economic sustainability and sustainable human well-being² well above the amounts currently reflected in the FY13 budget request and far above what is fiscally responsible at this time.

The overall budget request for OneNSF Framework activities is \$807 million, an increase of \$291 million or 56 percent over the FY12 level. While the Committee is appreciative of the Foundation's goal to enable a seamless operation across organizational and disciplinary boundaries and supports the majority of funding priorities for this Framework, it is concerned that the additional funding requests continue to exceed what is prudent in this economic climate. In addition to the SEES request, the Committee questions the necessity of \$49 million in new funding for the E² initiative, \$29 million of which is funded through the RRA account. Further, the Committee is concerned with the \$19 million request for I-Corps and believes the implementation and expansion of this program, which "builds upon fundamental research" but moves beyond that to "guide the output of scientific research towards the development of technologies, products, and processes that benefit society" continues to move the Foundation from its core mission of supporting basic R&D to significantly more support for applied areas of R&D, which are best left to market forces or agencies with specific applied R&D goals to advance their mission. The Committee believes that while basic research can and should lead to entrepreneurship, it is not an appropriate role for NSF to use its limited research dollars to provide additional federal funds to grantees in order to "increase the number of entrepreneurs emerging from university laboratories,"³ as is stated as a priority goal of I-Corps. The Committee believes this is primarily a university responsibility. Further, it is the Committee's view that this program runs the risk of picking winners and losers.

In addition to OneNSF Framework investments, the FY13 NSF RRA budget request also illustrates the manner in which NSF plans to advance all fields of science and engineering and educate the workforce of tomorrow through their portfolio. NSF will continue investments in a number of multifaceted programs, including a \$335 million investment in Clean Energy, a \$149 investment in Advanced Manufacturing, a \$216 million investment in the Faculty Early Career Development program (CAREER), a \$243 million investment in the Graduate Research Fellowship program (GRF), and a \$158 million investment in the Experimental Program to Stimulate Competitive Research (EPSCoR).

Education and Human Resources (EHR)

The FY13 budget request for Education and Human Resources (EHR) is \$845.6 million, a \$46.6 million or 5.6 percent increase over the FY12 level and the largest percentage increase for the agency.

Significant increases in the FY13 budget request include \$20 million, a \$12 million or 150 percent increase over FY12, for the Widening Implementation and Demonstration of Evidence-based Reforms (WIDER)/E² program and \$20.5 million for a new Expedition in Education (E²) initiative to engage, empower, and energize learners in STEM. Again, while fully supporting

² *FY12 NSF Budget Request to Congress*, NSF-Wide Investments, p. 37

³ *FY13 NSF Budget Request to Congress*, NSF-Wide Investments, p. 28.

STEM education research, the Committee questions the use of limited resources on new, unproven initiatives, while cutting funding for proven ones.

The FY13 budget request continues to flat fund the Robert Noyce Scholarship Program (NOYCE) at \$54.9 million and the Math and Science Partnership (MSP) at \$57 million and decreases funding for the federal Cyber Service: Scholarship for Service/Cybercorps (SFS) program by 44 percent to \$25 million. Likewise, the Administration's budget request continues to place a high priority on Graduate Research Fellowships (GRF) by increasing the funding to \$121.5 million, a 10.8 percent increase over the FY12 level, while significantly reducing funding for the Integrative Graduate Education and Research Traineeship Program (IGERT) to \$22.9 million, a 26.7 percent cut. The Committee continues to believe that increasing the number of GRFs is a laudable goal in a better economic environment, but continuing to increase the funding level for GRFs while essentially ignoring other graduate programs, is not fiscally responsible.

Several new or reprogrammed initiatives are to be carried out in conjunction with the Department of Education (ED), the Office of Science and Technology Policy (OSTP), and other federal science mission agencies to address national priorities in STEM education through a coordinated STEM education investment strategy. While the Committee supports a more engaged ED with regards to STEM education, it continues to believe that the STEM-related research and expertise that NSF can and does provide is world-class and needs to be included in any appropriate larger, overarching STEM education activities carried out by the federal government.

The FY13 request also calls for fundamentally reframing the EHR investment portfolio into three categories: Core R&D, Leadership, and Expeditions. The Core R&D investments include four divisions: STEM learning, STEM learning environments, broadening participation and institutional capacity in STEM, and STEM professional workforce preparation. A new \$5 million "Core Launch Fund" to allow a first round of grant awards will shape each division. The Leadership investments will focus on the next generation of STEM researchers and educators. And finally, the Expedition investments will be a key component for EHR to partner with other NSF directorates and offices and with ED to take on specific challenges over defined periods of time. The Committee understands and commends the reconceptualization of the EHR directorate, but believes \$20 million in new funding is excessive and not necessary to launch this endeavor, and encourages the use of existing and lesser funds.

While the Committee commends the decision to reduce funding for the Climate Change Education Program, it continues to believe the program should be eliminated in its entirety, as other funds within the Foundation may already be used to support similar activities.

Major Research Equipment and Facilities Construction (MREFC)

The FY13 budget request includes \$196.2 for the Major Research Equipment and Facilities Construction (MREFC) account. This is a slight 0.4 percent decrease from FY12. The request includes funding for four existing projects: 1) \$91 million for the National Ecological Observatory Network (NEON); 2) \$25 million for the Advanced Technology Solar Telescope (ATST); 3) \$15 million for the Advanced Laser Interferometer Gravitational-Wave Observatory

(AdvLIGO); and \$65 million for the Ocean Observatories Initiatives (OOI). The IceCube Neutrino Observatory (IceCube) and the Atacama Large Millimeter Array (ALMA) no longer require MREFC funding.

Department of Energy (DOE)

The Department of Energy (DOE) funds a wide range of research, development, demonstration and commercial application activities. The overall FY13 budget request for DOE is \$27.2 billion, which represents an \$856 million or 3.2 percent increase over FY12 levels. Approximately one third of this amount is directed to research, development, and demonstration programs.

President Obama once more made clean energy technology development a centerpiece proposal of his State of the Union and reiterated his call for a clean energy standard (CES), which would require at least 80 percent of electricity to be generated by “clean” sources by 2035. The Committee recognizes the importance of energy technology development to America’s economic future, but has serious concerns with the overall spending and relative prioritization within the President’s budget request.

Office of Science (SC)

The DOE Office of Science (SC) is the federal government’s primary supporter of long-term basic research in the physical sciences, as well as design, construction, and operation of major scientific user facilities. Office of Science activities are organized into the following six major programs: Basic Energy Sciences (BES), Advanced Scientific Computing Research (ASCR), Biological and Environmental Research (BER), Fusion Energy Sciences (FES), High Energy Physics (HEP), and Nuclear Physics (NP). The FY13 budget request for SC is \$5.0 billion, a 2.4 percent increase over FY12 levels.

The Committee recognizes the key scientific role the Office of Science performs in the federal government’s research capabilities. The Office of Science has an established record of making crucial scientific discoveries and serves as a long-term driver of innovation and economic growth. We also acknowledge SC’s record of excellence in managing world-class scientific facilities, which deliver revolutionary scientific breakthroughs in numerous scientific disciplines. Accordingly, the Committee believes the SC should be the highest priority for DOE R&D programs.

However, in light of budget circumstances, the Committee believes there are some areas within the Office of Science budget that warrant consideration for reductions in spending. Of particular interest in this regard is SC BER activities, which fund significant research in areas ancillary to DOE’s primary mission or potentially duplicative of research funded elsewhere in the government (such as climate change). Specifically, the Committee is concerned that the Atmospheric System Research and the Climate and Earth Systems Modeling programs are duplicative of research programs at the National Oceanic and Atmospheric Administration (NOAA) and the National Science Foundation (NSF). Additionally, although the Committee supports Fusion Energy Sciences, the program is an area of concern due to high-risk program

management and international funding and cooperation challenges associated with the ITER project, while the relative value of SC spending on science education and workforce development also warrants further review.

The Committee objects to the budget request to have the Office of Science redirect funding and administrative and technical support to the President's Council of Advisors on Science and Technology (PCAST). PCAST serves exclusively to advise the President, and is charged with providing science and technology advice on matters concerning all federal agencies, not just the DOE Office of Science. As such, funding and administrative support should be requested and appropriated through the White House Office of Science and Technology Policy, and not be re-directed from other agencies.

Advanced Research Projects Agency – Energy (ARPA-E)

The Administration request for the Advanced Research Projects Agency – Energy (ARPA-E) is \$350 million, a \$75 million or 27.3 percent increase over FY12. In FY11, ARPA-E received \$180 million. The DOE budget request states that in FY13, ARPA-E will emphasize: (1) \$184 million for Transportation Systems, including batteries and systems for electric vehicles and development of market competitive fuels using domestic resources such as natural gas; and (2) \$130 million for Stationary Power, including challenges associated with “power electronics, solar, wind, osmotic power, smart grid technologies, natural gas, geothermal, and waste heat capture.”⁴

When ARPA-E was established, many expressed concern that it would be funded at the expense of priority basic research programs within the Office of Science. In 2006, DOE Secretary Chu, then-Director of the Lawrence Berkeley National Laboratory and appearing before the Committee on behalf of the National Academies' “*Rising Above the Gathering Storm*” panel testified, “In funding ARPA-E, it is critical that its funding not jeopardize the basic research supported by the Department of Energy's Office of Science. The committee's recommendations are prioritized and its top recommendation in the area of research is to increase the funding for basic research by 10 percent per year over the next seven years.”⁵ The Committee agrees with the National Academies' panel that basic research at the Office of Science should be a higher funding priority than ARPA-E and is disappointed that the budget does not reflect this recommendation.

The Committee also believes ARPA-E can improve its focus to better ensure it avoids funding late-stage technology development and commercialization activities more appropriately supported by the private sector. While most ARPA-E funding appears directed toward high-quality, high-risk research that is too risky for private investment, in some instances ARPA-E funding has accelerated existing private efforts. The Committee is also concerned that ARPA-E has allowed awardees to incur costs of questionable appropriateness, including using award funds to seek additional government funding and using funds for meeting with investors, as well as for commercialization, marketing, and promotion of ARPA-E funded technologies.

⁴ Department of Energy, *Detailed Budget Request Volume 4*, p. 417.

⁵ Steven Chu, testimony before the Committee on Science *Rising above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* hearing, March 9, 2006.

Accordingly, the Committee recommends that ARPA-E funding not exceed its FY12 House Appropriations Committee-passed level of \$100 million, and that the agency place greater emphasis on overcoming fundamental scientific challenges and pursuing potentially transformational early-stage applied research.

Nuclear Energy (NE)

The Administration request for Office of Nuclear Energy (NE) R&D programs is \$770.4 million, a .7 percent increase (\$5.1 million) from the FY12 level. NE's four primary research programs - Reactor Concepts RD&D, Fuel Cycle R&D, Light Water Reactor Small and Modular Reactor Licensing Technical Support (LWR SMR Technical Support), and Nuclear Enabling Energy Technologies (NEET) - comprise approximately half of the total NE request. The total NE research declines significantly in the request. The majority of this decrease is proposed to come out of the Reactor Concepts program (decreased by \$41.2 million), including the Next Generation Nuclear Plant (NGNP, decreased by \$19.2 million), advanced small modular reactors (decreased by \$9.5 million), and advanced reactor concepts (decreased by \$9.5 million).

The Committee recommends additional funding to advance nuclear energy technology and is disappointed the budget significantly reduces key NE research programs. The March 2011 earthquake and ensuing tsunami near Fukushima, Japan serves as a strong reminder of the need to ensure nuclear reactors continue to operate with maximum attention to public health and safety. Accordingly, the Committee supports continuing analytical examination of issues associated with nuclear safety in the Light Water Reactor Sustainability subprogram, such as identifying advanced fuel cladding to provide additional safety measures in the event of an unforeseen event.

The budget includes \$59.7 million for the third year of the Used Fuel Disposition Research and Development subprogram, which examines issues associated with managing the back end of the nuclear fuel cycle. The Committee supports moving forward with the deep geologic repository for spent nuclear fuel and recognizes near-term activities have the potential to reduce uncertainties associated with handling of spent nuclear fuel.

The budget requests \$65 million for the second year of the LWR SMR Technical Support program, a decrease of \$2 million or 3 percent from FY12 levels. SMRs hold great potential to impact electricity generation; however, still require approval and licensing from the Nuclear Regulatory Commission (NRC). The second year of funding for this program will begin development of the license application for SMR designs. DOE should further its work with NRC to complete the licensing process.

Energy Efficiency and Renewable Energy (EERE)

The Office of Energy Efficiency and Renewable Energy (EERE) funds a wide array of energy efficiency and renewable energy technologies. The Administration's budget request of \$2.3 billion for EERE represents a 29.1 percent (\$527.4 million) increase from the FY12 level. This reflects President Obama's continued emphasis on increasing spending to develop clean energy

technologies. Many EERE programs receive notable funding increases relative to the FY12 level. Specifically, the Advanced Manufacturing Program (formerly the Industrial Technologies Program) receives a \$174.4 million increase (151 percent), of which over \$100 million is added to the Systems Integration subprogram to demonstrate manufacturing processes. Geothermal Technology would see an increase of \$27.1 million (71.7 percent) to expand the enhanced geothermal subprogram and the Building Technologies program would receive an additional \$90.8 million (41.4 percent) to advance technologies and reduce market barriers.

The Committee objects to the requested increase in EERE's budget. This concern is based on: (1) EERE's focus on incremental, relatively low-impact technological advances through technology development, demonstration, commercialization, and deployment activities, many of which are unnecessary and represent inappropriate involvement in the marketplace, resulting in the government "picking winners and losers" among competing companies and technologies; (2) EERE's recent significant budget increases, which reflect a 56 percent increase since FY06, in addition to \$16.5 billion in stimulus funding; and (3) the significant potential for overlap and duplication resulting from DOE's multitude of clean tech-focused programs and activities. Further, beyond specific programmatic concerns, the ability of the office to responsibly manage and effectively oversee a nearly 30 percent year-over-year budget increase is questionable.

EERE aligns its budget portfolio into four program activities based on Technology Readiness Levels:⁶ Innovations (TRL 2-3), Emerging Technologies (TRL 3-6), Systems Integration (TRL 6-8), and Market Barriers (TRL 8-10). The Committee commends EERE for this informative characterization, but is concerned that nearly 40 percent of EERE funding is directed to late stage TRLs closest to market deployment and commercialization. For example, the Biomass and Biorefinery Systems program requests an additional \$60.9 million to support deployment of a feedstock demonstration unit. The Solar Energy Technologies program requests a 140 percent increase to address "market barriers" by "using standard scientific techniques of data collection, analysis and the development of algorithms to reduce the permitting costs/time for solar installation."⁷ The Committee believes the marketplace is best positioned to reduce associated installation costs, not the federal government.

Included in EERE's budget is a request by the Department for legislative language allowing the Secretary of Energy to transfer up to \$100 million to the Defense Production Act Fund. According to the request, this transfer would support biofuel pilot demonstration projects as well as certain activities in the Advanced Manufacturing Program. The Committee questions the appropriateness of the request and seeks clarification as to the financial and programmatic consequences of such.

These concerns exemplify general trepidation associated with EERE. The Committee will continue to fulfill its oversight responsibilities of EERE and conduct a thorough examination of

⁶ Technology Readiness Levels (TRL) are a method to characterize the maturity of a technology. The Department of Energy has detailed the descriptions of each level, which generally translate to the following stages of technology evolution: 1-2 Basic Technology Research; 2-3 Research to Prove Feasibility; 4 Technology Development; 5-6 Technology Demonstration; 7-8 System Commissioning; and 9 System Operation. For more information see "Technology Readiness Assessment Guide (DOE G 413.3-4)." United States Department of Energy, Office of Management. October 12, 2009.

⁷ DOE Detailed budget p. 88.

EERE's programs. Recognizing the tight budgetary outlook, the Committee recommends reducing spending on EERE to maximize the value of limited taxpayer dollars, and focusing programs on early-stage applied research activities with the broadest potential benefits.

Electricity Delivery and Energy Reliability (OE)

The Office of Electricity Delivery and Energy Reliability (OE) oversees the modernization of the electric grid, the reliability of energy infrastructure, and conducts research and development for energy delivery-related technologies. Research and Development within OE would be funded at \$103.4 million in the President's FY13 budget request. This would reflect an increase of \$4.3 million (4.3 percent) from FY12 levels. Additionally, the President requests \$20 million for the creation of an Electricity Systems Hub to be administered by OE.

The Committee notes the potential contributions of OE efforts to enhance electricity reliability and grid security, but remains concerned the OE portfolio includes R&D significantly overlapping with and potentially duplicative of other DOE programs. For example, the Office of Science, EERE's Vehicle Technologies Program and multiple ARPA-E programs all fund battery and energy storage research programs that, while generally distinct, appear to support potentially duplicative technology areas. The Committee also has reservations about the creation of a new Energy Innovation Hub. The proposed OE Hub would address issues associated with the nexus of power and information flows to reduce integration and coordination barriers. However, ARPA-E's "GENI" program and OE's other research programs currently fund R&D to integrate advanced power systems with the grid. These activities as well as others throughout DOE may potentially overlap with the Hub's activities. Additionally, the Committee finds it premature to fund a new Hub prior to thorough consideration of the performance of existing Hubs, including review of the assessment called for by the FY12 appropriations bill.

Fossil Energy (FE)

The DOE Office of Fossil Energy (FE) supports research and development focused on coal (including "clean coal" technologies), natural gas, and petroleum and also supports the federal government's Strategic Petroleum Reserve. The President's total budget request for the Office of Fossil Energy (FE) is \$650.8 million. FE's research and development budget is \$420.6 million, an increase of \$73.9 million, or 21.3 percent, from FY12 levels. The FY12 level of \$533.7 million included a rescission of \$187 million resulting from termination of a major carbon capture and sequestration (CCS) demonstration project funded in a previous fiscal year. The base budget request for FE R&D, before accounting for this rescission, represents a decrease of \$105.2 million, or 19.7 percent.

The FY13 budget request includes \$275.9 million for Coal R&D, \$17 million for the Natural Gas Technology Program, and proposes to terminate the Unconventional Fossil Energy Technologies program. Within the Carbon Capture and Storage and Power Systems Subprogram, the budget request proposes to eliminate the Hydrogen from Coal, Coal and Coal-Biomass to Liquids, and Solid Oxide Fuel Cells activities.

The Committee continues to support an “all-of-the-above” approach to energy policy centered on aggressively developing domestic energy resources to ensure access to abundant and affordable energy. We are disappointed to see the budget again propose to eliminate the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research Program established in Section 999 of the Energy Policy Act of 2005 (P.L. 109-58). Section 999H(a) sets the funding for this program at a level of \$50-million-per-year provided from federal lease royalties, rents, and bonuses paid by oil and gas companies – not taxpayers. It should be clear that the overall program was initiated and carried out to reach energy known to exist in the areas targeted – energy that was impossible to produce without new technology – and that the required technology would be eventually be paid for from the energy captured. Further, the Section 999 program is the only R&D program in the federal government capable of addressing drilling safety and accident prevention-related technology needs in a timely and effective manner.

The Committee disagrees with the myopic focus of FE’s Coal R&D on near term Carbon Capture and Sequestration (CCS) programs at the expense of other research that could enable increased efficiency of coal-fired electricity, reducing operating costs and traditional criteria pollutant emissions. For example, the budget decreases the funding for Advanced Energy Systems \$45 million. FE’s goal to capture carbon dioxide at “no more than a 35 percent increase”⁸ in electricity costs is indicative of FE’s misguided approach. DOE should seek to reduce the cost of electricity, rather than raise it. The Committee appreciates FE’s recognition that CCS by itself is not economically viable and the need to acquire commercial value of sequestered carbon through a Carbon Capture, Utilization, and Sequestration (CCUS) program. However, the Committee remains concerned this approach is still imprudent and will result in increased costs on American energy consumers.

The Committee is pleased the budget did not request additional funding for the Clean Coal Power Initiative (CCPI), choosing instead to focus on its portfolio of existing demonstration projects. Key milestones are scheduled for FY12 and FY13 for the current portfolio of CCPI demonstration projects, and the Committee expects to actively monitor the status of those projects.

The Committee is skeptical of the request for \$17 million for the Natural Gas Technologies Program, of which \$12 million is dedicated to a new priority collaboration with the Environmental Protection Agency and the U.S. Geological Survey to “understand and minimize the potential environmental, health, and safety impacts of shale gas development through hydraulic fracturing” as recommended by an Administration appointed panel. The budget provides very little information on what research topics or questions this funding seeks to answer, and the Committee is concerned this program is intended to simply identify additional opportunities for the Administration to regulate hydraulic fracturing. The Committee supports the current practice of state regulation of hydraulic fracturing and is concerned that the Administration seems to be actively searching for a reason to regulate this abundant domestic energy resource.

Loan Guarantee Program Office (LPO)

⁸ Department of Energy, Detailed Budget Request, Volume 3, p. 414.

Title 17 of the Energy Policy Act of 2005 authorizes DOE to make loan guarantees to encourage early commercial use of new or significantly improved technologies in energy projects. Projects supported must avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; employ new or significantly improved technologies; and offer a reasonable prospect of repayment of the principal and interest on the guaranteed obligation.

The FY13 budget for the Loan Guarantee Program Office requests \$38 million for administrative operations “to focus on portfolio management and monitoring activities on the existing portfolio as well as originating new loan guarantees to utilize remaining loan authority in the nuclear power, front-end nuclear, fossil, and renewable and energy efficiency sectors.”⁹ The Administration proposes to offset requested spending with an equivalent amount of fee collections for a net-zero budget request. Additionally, the budget request states that the Department still has \$170 million in credit subsidy funds available from prior appropriations that it intends to deploy.

The loan guarantee program offers businesses the ability to secure below market financing rates. Private financial institutions have a record of supporting economically feasible and valuable projects. Highly-developed financial markets have the necessary tools to evaluate the relative worth of an energy project and provide the appropriate level of financing. Accordingly, the federal government should avoid interference in energy technology markets that results in “picking winners and losers” among competing companies and technologies. This concern is further exacerbated by the appearance that political favoritism drove decision-making associated with loan decisions, particularly with respect to Solyndra, but potentially in the case of other loans as well.

In light of the loan guarantee program’s troubling record, the Committee supports funding only those activities necessary to support management and oversight of the existing portfolio of loans, and recommends returning remaining credit subsidy funds to deficit reduction.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) carries out its mission of science, service, and stewardship through activities to improve the understanding of oceans and atmosphere and how their interactions affect human life, property and ecosystem health. NOAA provides critical weather and climate data necessary to protect lives and to enhance commerce through the National Weather Service (NWS) and the National Environmental Satellite, Data, and Information Service (NESDIS). NOAA is responsible for mapping and charting coastal areas and other navigation support services through the National Ocean Service (NOS). NOAA also manages fisheries and conducts research on marine ecosystems and marine mammals through the National Marine Fisheries Service (NMFS). Finally, NOAA supports atmospheric and oceanic research through its Office of Oceanic and Atmospheric Research (OAR).

NOAA’s FY13 budget request is 5.1 billion, an increase of \$153.9 million or 3.1 percent above the FY12 level.

⁹ *Department of Energy, Budget Highlights*, p. 52.

National Environmental Satellite, Data and Information Service (NESDIS)

The FY13 budget request for the National Environmental Satellite, Data and Information Service (NESDIS) is \$2.04 billion, a \$163.6 million or 8.7 percent increase over FY12 levels. This line office accounts for 40 percent of NOAA's total budget request. The bulk of the request is for the Joint Polar Satellite System (JPSS)¹⁰ and the Geostationary Operational Environmental Satellites (GOES-R) program.

The budget request for JPSS is \$916 million, a \$7.4 million or 0.8 percent decrease below FY12. While the Committee was pleased to see the successful launch of the research-turned-operational NPOESS Preparatory Project (NPP) satellite in October 2011, the Committee remains extremely concerned about the potential for a data gap between the time that NPP expires and the first JPSS satellite launch in 2018. Furthermore, the Committee does not agree with NOAA's characterization of the gap as the result of insufficient funding in prior fiscal years. For years, this program and its predecessor have been plagued with cost over-runs, poor management, agency infighting, technical problems and contractor mistakes. The program restructuring in 2010 also increased costs and delayed the program schedule.¹¹ Furthermore, in the two years since the Administration announced the separation of the original program, NOAA has not re-baselined the JPSS budget as required under P.L. 110-161 and P.L. 109-155. This inaction and delay is troubling, and significantly hinders the Committee's ability to conduct proper oversight and undertake a complete assessment of the program's future. Additionally, the Committee is extremely concerned that NOAA has not developed a viable plan for acquiring necessary data if the gap materializes as expected. The Committee recommends an immediate focus on such an effort and believes that any such plan should be developed in a scientific manner, utilizing the resources and expertise of other NOAA line offices.

The largest increase in the NESDIS request is for the GOES-R program. NOAA is requesting \$802.0 million for FY13, a \$186.4 million or 30.3 percent increase above FY12 levels. The Committee supports this increase as part of the planned ramp-up for this program, which is critical for weather forecasting and must remain on track for replacing existing geostationary satellites when they become nonoperational.

Office of Oceanic and Atmospheric Research (OAR)

The FY13 request for the Office of Oceanic and Atmospheric Research (OAR) is \$413.8 million, an increase of \$29.1 million or 7.6 percent above the FY12 level. The Committee supports a strong research enterprise at NOAA but disagrees with the Administration's prioritization and proposal to direct new funding almost exclusively to climate research. Rather, the Committee

¹⁰ This program was previously the National Polar-orbiting Operational Environmental Satellite System (NPOESS), a tri-agency program with the National Aeronautical and Space Administration (NASA) and the Department of Defense (DoD). As part of the FY2011 budget request, the Administration split NPOESS into two programs. NOAA and NASA have responsibility for the JPSS program to cover the afternoon satellite orbit. DoD has already canceled its separate polar weather satellite program for the early morning orbit.

¹¹ See footnote #1.

believes the top priorities for OAR should be weather research to better protect American lives and property and fundamental science and basic research supported by its labs.

Specifically, the Committee notes its support for specific investment in three targeted weather forecasting and prediction innovations. The Multi-function Phased Array Radar (MPAR) R&D will greatly improve next generation weather radar forecasting accuracy and capability. Unmanned Aircraft Systems (UAS) R&D will allow for the testing and use of UAVs with NOAA instruments for significantly enhanced data and observations, especially useful when forecasting hurricanes. Baseline Information Technology R&D resources will enable integration of graphic processing units (GPUs) into supercomputers enabling weather and climate models to run significantly faster, more accurately, and at lower cost.

Within the climate research program, the Committee is supportive of NOAA's request for funding for the National Integrated Drought Information System, a vital program for researching and communicating information on droughts. However, the Committee does not support the increase requested for the climate portal, NOAA's climate website that has raised concerns regarding the objectivity and scientific robustness of the information posted to it. Instead, the Committee would encourage funding for such climate program to be used to offset the requested reduction to the Great Lakes Environmental Research Laboratory.

Funding for many programs have suffered significant budget cuts in the last few years as a direct result of NOAA redirecting funding to satellite programs. The Committee believes the above-mentioned OAR priorities—of small relative cost that can be offset by a redirection of lower priority climate research—will provide tremendous returns in terms of out-year budget savings, protection of lives and safety, and the potential avoidance of billions of dollars in property damages.

National Weather Service (NWS)

The Committee is generally supportive of the overall National Weather Service (NWS) FY13 budget request of \$972.2 million which is a 2.0 percent decrease from the FY12 level of \$991.9 million. The Committee is pleased that NWS plans to establish regional Information Technology (IT) Collaboration units to capitalize on efficiencies made through previous investments, and the resulting \$9.7 million decrease in the request for these programs from FY12 levels of \$12.1 million indicates NWS is heeding Congress' call to become more efficient while still providing exemplary services. Furthermore, the Committee supports the \$7 million increase for the NWS telecommunications gateway and believes planned improvements will increase the ability of NWS to ensure timely flow of critical information to the public. With continuing concerns about the quality of the surface temperature data used for climate prediction, the Committee is hesitant about the zeroing out of funding for the National Mesonet Network. The Mesonet Network was established in response to the National Academy of Sciences expressing concern regarding the lack of integration of distributed monitoring and observational networks. While NWS will be able to achieve quality forecasts using existing networks, the quality of data generated by outside groups and the ability of NWS to properly integrate it into its own databases is a concern. Therefore, the Committee would support a decreased amount of funding for the Mesonet Network as opposed to a complete elimination of the program, as long as this would not increase

the total proposed budgetary request. Finally, while there is concern about the virtual elimination of the NOAA Profiler Network, which provides Doppler Radar wind profile data, the Committee understands that upgrades to this system would be prohibitively expensive. The Committee believes NWS should develop a plan to help replace data provided by the Profiler Network.

National Ocean Service (NOS)

The Committee is supportive of the National Ocean Service (NOS) FY budget request of \$478.1 million which is a 2.4 percent decrease from the FY12 level of \$490 million. Despite this overall decrease, the Committee supports the budget increases requested for the Integrated Ocean Observing System and competitive research in the National Centers for Coastal Ocean Science. Both are critical to understanding harmful algal blooms and hypoxia conditions that occur in U.S. waters. Despite the Administration's intent to implement Coastal and Marine Spatial Planning (CMSP), a comprehensive plan to zone the ocean, NOAA did not include any funding request in the FY13 budget. The Committee believes that any sweeping initiative such as CMSP requires a strong basis in science and that the lack of a request for CMSP in the NOAA budget suggests the Administration intends to implement this policy without the necessary scientific justification. The Committee strongly objects to NOAA carrying out any such policy until the appropriate research has been conducted and is available to inform decision-makers.

National Institute of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) is a non-regulatory laboratory of the federal government tasked with innovation and industrial competitiveness by advancing measurement science, standards and technology in ways that enhance economic security and improve our quality of life.

In FY13, the Administration has requested a funding level of \$857 million or a 14.1 percent increase from FY12 funding for NIST. The budget request would provide \$648 million for NIST's core Scientific and Technical Research and Services (STRS); \$60 million for Construction of Research Facilities (CRF); and \$149 million for Industrial Technology Services (ITS) programs, including \$128 million for the Manufacturing Extension Partnership (MEP) program, and \$21 million for the Advanced Manufacturing Technology (AMTech) Consortia Program.

Research and Facilities

The FY13 NIST budget request for Scientific and Technical Research and Services (STRS) is \$648 million, an increase of \$81 million or 14.3 percent over the FY12 level, and contains an increase of \$45 million in measurement science research for advanced manufacturing. The budget request also includes \$20 million to establish four competitively selected Centers for Excellence in measurement science areas defined by NIST.

The Committee remains supportive of NIST STRS activities and recognizes the importance of these activities to the economic security of the country. However, while the Committee believes it is prudent to support a modest increase in STRS funding, it will continue to scrutinize the specifics of the FY13 request. The Committee will expect additional information from NIST on its proposed increases for measurement science research for advanced manufacturing to ensure that these programs remain pre-competitive and have the potential to result in significant innovations in the future.

The FY13 budget request for Construction of Research Facilities (CRF) is \$60 million, an 8.3 percent increase over the FY12 level. CRF funding would support maintenance and repair of existing NIST buildings (\$48.2 million) as well as continue the interior renovation efforts of Building 1 on the NIST-Boulder campus (\$11.8 million). The Committee supports the completion of the renovations of Building 1, and believes funding for maintenance and repair of existing facilities should be prioritized over any new construction activity.

Industrial Technology Services (ITS)

The FY13 budget request for Industrial Technology Services (ITS) is \$149 million, an increase of \$20.6 million or 16 percent over the FY12 level.

The Committee believes the \$128 million request for the Manufacturing Extension Partnership (MEP) program, a \$0.4 million or 0.3 percent decrease from the FY12 level, is appropriate. The MEP program is a public/private partnership run by Centers in all 50 states and Puerto Rico that provides technical assistance for small and medium-sized manufacturers to modernize their operations and adapt to foreign competition. MEP Centers are supported by equal contributions from federal funds, state funds, and industry client fees.

The Committee continues to question the creation of the proposed Advanced Manufacturing Technology Consortia (AMTech) Program, which did not receive funding in FY12, and which has an FY13 request of \$21.0 million. This program would establish industry-led consortia to identify and prioritize research projects supporting long-term industrial research needs. Continued scrutiny of this program and its funding request is necessary.

National Network for Manufacturing Innovation

The Committee has significant concerns about the creation of a \$1 billion National Network for Manufacturing Innovation (NNMI). This proposed program exceeds the entire annual budget of NIST in a time of fiscal crisis. To date, the Committee has not received an adequate description of the program, its goals, or its parameters for success. The Committee will need to further scrutinize this request.

Wireless Innovation Fund

In FY13, the Administration has included a plan to invest broadband spectrum auction proceeds in a variety of areas, including providing NIST with up to \$300 million for a Wireless Innovation (WIN) Fund to establish a competitive grant program designed to award grants for public safety

communications research, development, and demonstration projects. NIST's participation is a piece of the \$7 billion National Wireless Initiative included in the American Jobs Act. The Committee will thoroughly review the plans for this program, but is generally supportive of dedicating broadband spectrum auction proceeds to address both public safety communications research and development at NIST and deficit reduction.

Department of Homeland Security (DHS)

The Department of Homeland Security Science and Technology Directorate (DHS S&T) funds research, development, and testing and evaluation to improve the security of the Nation. The Domestic Nuclear Detection Office (DNDO) is dedicated to both the development and enhancement of the global nuclear detection architecture, the coordination of nuclear detection research and development, and the establishment of procedures and training for end users of nuclear detection equipment.

The FY13 budget request for DHS S&T is \$831.5 million, an increase of \$163.5 million or 24.5 percent from the FY12 level. Within DNDO, the FY13 budget is \$328 million, a \$38 million or 11.6 percent increase from the FY12 level.

The Committee recognizes the important role that research and development plays in supporting DHS's mission, and believes that the S&T Directorate should be provided with the resources it needs to keep our nation safe and our borders secure. However, in a constrained fiscal environment, it is essential that DHS gets the most out of each and every scarce dollar by providing tangible results that further the Department's mission, and coordinating with other agencies to maximize efficiencies. The Committee is pleased that the funding increase at DHS S&T is focused on the Research, Development, and Innovation (RD&I) account, and specifically R&D for DHS S&T's stated priorities: biological threat security (\$135.4 million), cybersecurity (\$64.5 million), explosives/aviation security (\$119.7 million), and first responder technology development (\$49.3 million).

The Committee notes that the DNDO FY13 budget request indicates a departure from the beleaguered Advanced Spectroscopic Portal (ASP) Program, and a shift towards a new "Commercial First" acquisitions strategy, as well as increased investments in Human Portable Radiation Detection Systems. This transition to a reliance on Commercial-Off-The-Shelf (COTS) technology, and increased prioritization of next generation Radio-Isotope Identification Devices (RIIDs) will require continued oversight of the Department's test and evaluation (T&E) operations and proposed concept of operations in order to ensure its success.

The Committee recognizes the value of both the Assistance to Firefighter Grants (AFG) and Staffing for Adequate Fire and Emergency Response (SAFER) grants to our Nation's fire departments. The AFG and SAFER grant programs are funded at \$335 million each, a slight reduction from FY12 funding. The Committee is pleased that the Administration has provided parity in the funding requests for the AFG and SAFER grant programs in FY13, ensuring that the two programs can continue to serve their complementary purposes. However, the Committee remains concerned that the Administration continues to expand the SAFER program with the

proposed creation of a \$1 billion First Responder Stabilization Fund. The fund would provide assistance for the hiring of firefighters, with a preference on programs and policies that focus on the recruitment of post-9/11 veterans for firefighter positions. The Committee is concerned that the proposed fund exceeds the total funding for the AFG and SAFER grants combined, and would surpass historical appropriations for both grant programs.

The Committee supports the Administration's FY13 request for the United States Fire Administration (USFA) of \$42.5 million. The Committee recognizes the USFA's important mission of providing leadership, coordination, and support for the Nation's fire prevention and control, training and education, and emergency medical services activities.

Environmental Protection Agency (EPA)

The Science and Technology (S&T) account at EPA covers research and development activities at the Agency's Office of Research and Development (ORD) as well as activities in other line offices. ORD activities represent 68 percent of the overall S&T budget, and the S&T account provides 96 percent of ORD funds. The FY13 budget request for S&T is \$807.3 million, a 1.7 percent increase from FY12 levels. The request for ORD is \$576.6 million, a 1.3 percent increase from FY12 levels.

The President's ambitious regulatory agenda relies heavily on EPA authorities, and appropriate use of those authorities is dependent on objective, transparent scientific and technical information. Unfortunately, Committee oversight efforts have identified numerous instances in which such information was distorted, withheld from scrutiny, and selectively used to advance a pre-determined agenda. As a result of EPA's advocacy-driven scientific activities and the lack of transparency in major environmental research funded by the Agency, the Committee sees fundamental reforms and adherence to the newly-developed Scientific Integrity Policy as a prerequisite to funding EPA research at even existing levels.

In addition to requesting \$6 million for ongoing research on hydraulic fracturing and drinking water, the Agency has requested an additional \$8 million as part of a \$45 million effort with the Department of Energy and the U.S. Geological Survey to examine the impacts of hydraulic fracturing on air, water quality, and ecosystems. The budget provides very little information on what research topics or questions this funding seeks to answer, and the Committee views this indiscriminate, "kitchen-sink" approach as indicative of an Administration in search of evidence to support a precautionary policy, ignoring and sidestepping the expertise and authority of the States. Furthermore, the request for additional funds for new research on hydraulic fracturing has reduced funding available for research on pathogen exposure and drinking water technologies. Due to these concerns, as well as the Agency's haphazard and nontransparent approach to research conducted thus far on hydraulic fracturing, the Committee does not support any additional funding for EPA research in this area.

In light of the numerous problems with the Agency's Integrated Risk Information System (IRIS) that have been highlighted by the National Academy of Sciences, Government Accountability Office, and in testimony before the Committee, the Committee recommends that resources be directed to ensure that all ongoing assessments adhere to more rigorous peer review, as well as

the requirements outlined in the conference report of the Consolidated Appropriations Act of 2012, as well as the recommendations in chapter seven of the National Academy of Sciences' Review of EPA's Draft IRIS Assessment of Formaldehyde. Despite EPA's assurances, recently-released IRIS assessments for dioxin and trichloroethylene have failed to incorporate these reforms, further undermining the credibility of the program. The Committee also notes concern with potential duplication and conflicts between the IRIS program and health assessment programs in other agencies. Although individual programs have unique charges and purposes, multiple assessments with differing conclusions may lead to confusion and unwarranted fear that does nothing to protect public-health and safety.

Also within ORD, the Committee is concerned that the request for an additional \$2 million to support the creation of a new "Center for Innovative Estuarine Approaches" ignores budgetary decisions by partner agencies on estuarine research, and may unnecessarily duplicate efforts. Within the budget request for the Air, Climate, and Energy research program, the Committee does not support EPA's proposal to significantly increase funding for climate change-related activities, including \$3.3 million in new funding requested for research on the interactions between climate change and air quality. The Committee views this request as an unnecessary and duplicative use of limited resources, demonstrated since similar research is already conducted by NASA and NOAA using the very models EPA proposes to use. Furthermore, despite technical challenges associated with final and forthcoming regulations on mercury and particulate matter, the Agency has proposed to eliminate its Mercury Research Program and to reduce funding for exposure assessment tools and particulate matter decision support tools by almost \$2 million. The Committee is concerned that the Agency's research focus on potential air quality and environmental impacts from hydraulic fracturing and climate change is representative of EPA's future regulatory agenda and ignores the real technical problems created by existing regulations.

EPA has pledged to operationalize the National Academy of Sciences' recommendations on sustainability, and the budget states that "[t]he EPA will incorporate sustainability principles into our policies, regulations, and actions."¹² The Committee is concerned about the lack of a detailed and useful definition of "sustainability," and fears that attempting to incorporate a value-laden interpretation in Agency actions could undermine quality science and sober analysis.

Department of Transportation

Federal Aviation Administration (FAA) – Research, Development and Technology

The FY13 budget request provides \$333.5 million for Federal Aviation Administration (FAA) research and development activities, plus an additional \$20.5 million for related activities, adding to a total request of \$354 million, a \$68.8 million decrease (16 percent) compared to the FY12 request. Agency R&D is spread among four accounts:

1. The Research, Engineering and Development (RE&D) account (Aviation Trust Fund), with a FY13 request of \$180 million, is \$10.0 million less than the amount requested in FY12. RE&D conducts research to support a safe, efficient and environmentally

¹² *Environmental Protection Agency, FY 2013 Budget in Brief*, p. 63.

acceptable aviation system in four key areas: Improve Aviation Safety; Improve Efficiency; Reduce Environmental Impact; and Mission Support.

2. A portion of the Facilities and Equipment account (Aviation Trust Fund) supporting engineering, development, test and evaluation, with an FY13 request of \$118.4 million, a \$59.1 million decrease (33 percent) compared to the FY12 request.
3. A portion of the Airport Improvement Program account (Aviation Trust Fund) with an FY13 request of \$44.3 million, the same as requested in FY12.
4. Office of Commercial Space Transportation, with an FY13 R&D request of \$1 million, a \$0.4 million increase (76 percent) compared to the FY12 request.

Office of Commercial Space Transportation (AST)

The FY13 budget request for the Office of Commercial Space Transportation (AST) (operations) is \$16.7 million, an increase of \$429,000 over FY12. AST is responsible for licensing and regulating commercial space launches and reentries to ensure compliance with standards designed to protect public safety. The Committee intends to conduct necessary and appropriate oversight of AST.

Office of the Assistant Secretary for Research and Technology

The Department of Transportation FY13 budget request has moved all activities currently performed by the ***Research and Technology Administration (RITA)*** to a new Office within the Office of the Secretary. The RITA Administrator would become the Assistant Secretary for Research and Technology.

The FY13 budget request for the research and development activities of the new Office of the Assistant Secretary for Research and Technology is \$13.7 million, a decrease of \$2.3 million, or 14.4 percent from the FY12 levels for RITA. The Assistant Secretary will be charged with coordinating and reviewing the Department's research, development, and technology portfolio. The Office has direct budgetary authority over salaries and administrative expenses, alternative fuels research and development, research and development and technology coordination, the Nationwide Differential Global Positioning System, and Positioning, Navigation, and Timing.

The Office also administers the University Transportation Center (UTC) program and the Bureau of Transportation Statistics.

The Committee is pleased that the Assistant Secretary will be playing a more significant role in coordinating research across the entire Department, and is supportive of the Secretary's increasing focus in the UTC program on longer-term research projects. The Committee remains concerned about the Department's focus on research programs such as Livable Communities at the expense of highway safety, infrastructure improvements, and congestion mitigation.

The Committee will continue its long-standing jurisdiction over Department of Transportation research activities through vigorous oversight of the new Office of the Assistant Secretary for Research and Technology.

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2. Representative James F. Sensenbrenner
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9. Representative Mo Brooks
10. Representative Larry Buschon
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12. Representative Frank D. Lucas
13. Representative Roscoe G. Bartlett
14. Representative Judy Biggert
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16. Representative Andy Harris
17. Representative Charles J. Fleischmann
18. Representative Benjamin Quayle
19. Representative Dan Benishek
20. Representative Randy Neugebauer



ADDITIONAL VIEWS
OF HON. DANA ROHRABACHER
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
FISCAL YEAR 2013 BUDGET REQUEST

American science and technology provides the basis for new industries, which increase the private sector workforce and improved the lives of millions of Americans. We must continue to enable our citizens to grow the economy, which is consistently the strongest in the world. This is difficult, when deficit spending and crushing debt threaten our nation's prosperity and freedom.

We must make every dollar count because we are borrowing 40 cents of every dollar the federal government spends. We must show restraint. We must not duplicate efforts across agencies and departments. And we must not continue to spend by mortgaging the futures of our children by borrowing from our friends and from our enemies. Although I agree with much of the Views and Estimates, there are some specific areas on which I wish to state a different view.

U.S. Global Change Research Program The Administration asks for more and more and more to spend on the U.S. Global Change Research Program (USGCRP), the government-wide program created by Congress in 1990 "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 among scientific and stakeholder communities." For FY 2013 the requested increase is 5.6% over FY 2012. These funds are requested directly in the budgets of NASA, NSF, NOAA, NIST, DOE, and other departments.

I must continue to be clear and direct - the entire budget for this program should be zeroed out. Federal global warming research is not reducing uncertainties in climate science. The research is not changing minds. If we spend \$2.6 billion in FY 2013, 40% of which we borrow from overseas, it will change zero minds about global warming. Every dollar spent on this is a dollar wasted. This path, which the Administration refuses to leave, is irrational and reckless.

National Aeronautics and Space Administration The budget request for Fiscal Year 2013 for the National Aeronautics and Space Administration (NASA) is significantly lower than expected by the NASA Authorization Act of 2010 (P.L. 111-267).

With our Exploration program, we are repeating history. Not the history of Apollo, but the history of Constellation. The funding is inadequate to the mission. The plan didn't fit under the expected funding level, and now that we have considerably less to work with we refuse to acknowledge reality. The single most important message of the Augustine

Commission was that you cannot succeed when your mission does not match your funding. The Administration continues to say that the SLS will fly in 2017 despite this significant budget pressure, but I remain skeptical.

I agree with the Committee that it is "unacceptable for the U.S. to rely on the Russian Soyuz system for the remainder of the ISS program" for crew transportation, but I strongly disagree about their suggested solution. In order to fix this problem we must fully fund the commercial crew program at the requested \$830 million. Commercial crew is our most critical near-term civil space goal, and it's time we acted like it. We underfund this critical program, and then complain that it isn't progressing quickly enough.

Our use of the \$100 billion International Space Station hangs in the balance. We currently rely on the Russians, who have been good partners, but the Soyuz is a single point of failure. We have it within our grasp to create redundancy by creating multiple, independent, sustainable systems that can bring people safely to orbit and return them to Earth. And NASA is spending \$450 million for crew access to ISS every year that we fail to create domestic, private sector crew transportation. The increase of \$330 million in this program above authorized levels is small relative to the potential gain for NASA, America, and humanity.

We continue to hear that the SLS/MPCV system will serve as a back-up for Earth-to-orbit transportation in the unlikely event that none of the other systems in development are successful. The FY 2013 request for this "back-up system" is 280% of the request of the primary system. By acting on this type of faulty logic, we have created a national debt as large as our GDP and still our nation refuses to take its foot off the deficit spending accelerator.

Department of Energy The Nuclear Energy R&D programs request continues the trend of maintaining the past instead of creating the future. In FY 2011, DOE's high temperature reactor programs - which include fast spectrum reactors, NGNP, and other advanced reactors - accounted for nearly 25 % of the DOE nuclear energy program, while in this request it is less than 15 %. During that same time, light water reactor programs have increased from 36 % up to 42 % of the program.

While the \$65 million request for the SMR program shows that we are moving forward on some fronts, it will be disappointing if that program only funds light water reactor designs.

This request doubles down on old technologies and slows down on new technologies. We should accelerate the design and construction of commercially viable fast spectrum reactors, which can create vast amounts of energy while consuming 97% or more of the so-called waste material. We, as a nation, are pursuing a strategy of dumping nuclear waste in a deep hole instead of using it as the energy resource it is. We should partner with industry to pursue these technical advancements to enhance our energy future.

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House of Representatives

Tuesday, March 6, 2012

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U.S. House Committee on Science, Space, and Technology

Additional Views: Fiscal Year 2013 Budget

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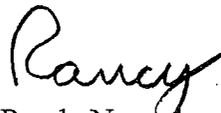
The U.S. national debt reached \$15 trillion last year, meaning that our irresponsible spending has now given each citizen a \$50,000 share of our debt. Unfortunately, while European countries' debt crises are providing examples of the unsustainable road we are following, Washington has failed to make even the slightest dent in our habit of overspending. The President's budget request for Fiscal Year 2013 forces us even further down the path toward a major debt crisis. This proposal is yet another example of the Administration's intention to drastically increase spending and run massive deficits year in and year out.

The President proposes increasing all non-defense and non-health specific research and development spending by 8.7 percent over FY12 levels, for a total of \$37.9 billion. This is fundamentally unsustainable, particularly at a time when the United States is borrowing 40 cents for every dollar we spend. While research and development funding in many scientific endeavors can have positive results, we must heavily scrutinize every single dollar of hard-earned taxpayer money that we send out the door. Unfortunately, our habit of repeatedly increasing spending each year cannot continue in our current fiscal environment, and research and development funding is no exception.

Specifically, the president proposes \$27.2 billion for the Department of Energy (DOE) in FY13. This is an increase of \$856 million (or 3.2 percent) over FY12 levels. Roughly one third of this is directed to DOE's research and development programs. The DOE Office of Science request is \$5 billion, representing an increase of 2.4 percent. While this office does perform important R&D activities, I believe that we must expect greater austerity and more effective leveraging of federal dollars by better utilizing private and university partnerships. It is absolutely essential that we end our pattern of enormous yearly increases in expenditures. Spending cuts at DOE and the Office of Science must be part of that plan.

The case can be made that many federal programs merit additional appropriations. Yet I refuse to pass this massive burden of debt and an ever-expanding federal government to our children and grandchildren. Some cuts in spending may be painful, but every program must be on the table. Unfortunately, the President's FY13 budget request reinforces his pattern of massive spending and record deficits.

Sincerely,



Randy Neugebauer
Member of Congress



Congress of the United States

House of Representatives

Additional Views and Estimates

Congressman Mo Brooks

Committee on Science, Space and Technology

Fiscal Year 2013

National Aeronautics and Space Administration:

The NASA Authorization Act of 2010 authorizes \$2.64 billion for the Space Launch System (SLS) and other *necessary* support for FY 2013. The President's FY 2013 Request allows for only \$1.3 billion for SLS, attributing the decrease to a diversion of approximately \$405 million to a new account entitled Exploration Ground Systems. While ground systems support is necessary for SLS, I continue to have concerns that the amount of funding being diverted to the Exploration Ground Systems account may not be fully necessary at this time and will continue to seek clarification on this issue.

According to Section 302 of the Authorization Act, the NASA Administrator "shall, as soon as practicable after the date of the enactment of this Act, initiate development of a Space Launch System meeting the minimum capabilities requirements specified in subsection (c)." Furthermore, per Section 302(c)(1)(D), the Space Launch System shall have, at a minimum, "The capability to serve as a backup system for supplying and supporting ISS cargo requirements or crew delivery requirements not otherwise met by available commercial or partner-supplied vehicles."

In addition, the Act states that the Administrator "shall continue the development of a multi-purpose crew vehicle to be available as soon as practicable, and no later than for use with the Space Launch System." I am pleased to see that the SLS and MPCV are finally underway but fail to see where this directive was carried out "as soon as practicable."

Furthermore, the Act states that the Administrator "shall ensure critical skills and capabilities are retained, modified, and developed, as appropriate, in areas related to solid and liquid engines, large diameter fuel tanks, rocket propulsion, and other ground test capabilities for an effective transition to the follow-on Space Launch System." Also related to this, Section 306 of the Act states the following:

(a) Report Required--Not later than 120 days after the date of the enactment of this Act, the Administrator shall submit to Congress a report setting forth an assessment, prepared by the Administrator, in consultation with the Secretary of Defense and the Secretary of Commerce, of the effects of the retirement of the Space Shuttle, and of

the transition to the Space Launch System developed pursuant to section 302, on the solid rocket motor industrial base and the liquid rocket motor industrial base in the United States.

(b) Matters To Be Addressed.--In preparing the assessment required by subsection (a), the Administrator shall address the following:

(1) The effects of efficiencies and efforts to stream-line the industrial bases referred to in subsection (a) for support of civil, military, and commercial users.

(2) The extent to which the United States is reliant on non-United States systems, including foreign rocket motors and foreign launch vehicles.

(3) Such other matters as the Administrator, in consultation with the Secretary of Defense and the Secretary of Commerce, may consider appropriate.

The intent of Congress is clear, and I am concerned that NASA continues to overfund programs such as Commercial Crew Development while underfunding the Space Launch System. The President's FY 2013 budget request for Commercial Crew is \$829.7 million, \$329.7 million *above* the amount authorized for FY2013 by the 2010 Authorization Act.

While it is good for the private sector to build commercial capabilities, it is a critical matter of national security that the United States maintains government access to space. This sentiment is echoed in Section 2 (9) of the 2010 Authorization Act, which states that "While commercial transportation systems have the promise to contribute valuable services, it is in the United States national interest to maintain a government operated space transportation system for crew and cargo delivery to space."

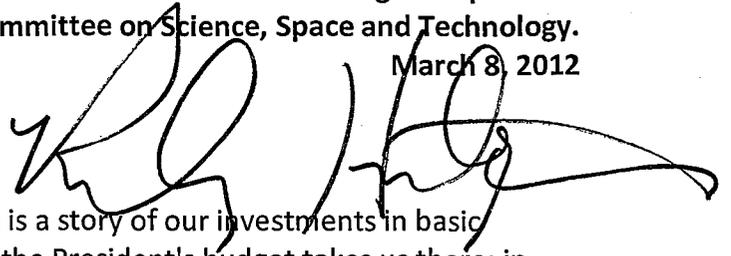
NASA, by law, continues to be a civilian space agency; however, the existence of dual use technologies and the liquid and solid rocket motor industrial base inherently tie the space agency with U.S. military capabilities. The Authorization Act states that "In the 50 years since the establishment of NASA, the arena of space has evolved substantially. As the uses and users of space continue to expand, the issues and operations in the regions closest to Earth have become increasingly complex, with a growing number of overlaps between civil, commercial and national security activities. These developments present opportunities and challenges to the space activities of NASA and the United States."

By continuing to divert funds from SLS, this Administration puts America at risk of indefinite reliance on the Russians for access to space. Meanwhile, countries such as China seek to develop military capabilities under the auspices of a civilian space agency and make no apology for this. Yet this Administration apparently fails to recognize the importance of United States government access to space. This is very troubling to me, and I will continue to closely monitor the progress of the SLS and MPCV.

Mo Brooks, ALO

**Rep. Hultgren - Additional Views and Estimates of President Obama's Budget Request for
Issues within the Jurisdiction of the Committee on Science, Space and Technology.**

March 8, 2012



I truly believe the story of American exceptionalism is a story of our investments in basic research and exploration. And I do not believe that the President's budget takes us there; in fact, I believe it undercuts that investment.

First, with regard to NASA, the President has decimated our Mars exploration budget, cancelled our plans to return to space exploration, and left us entirely dependent on the Russians with no contingency plans. And that is just his proposal for NASA; his proposal for fundamental science research and our national labs is even worse.

I am deeply troubled by the administration's lack of commitment to basic science research. Within the Department of Energy, the Office of Science received a modest 2.4% increase, well below the rate required to double its investment over the next 10 years. The story for dedicated High Energy Physics is worse.

The Administration's budget is not only unsupportive of Fermilab, it actively undermines both the current operations and future of the lab. The Long Baseline Neutrino Experiment (LBNE) represents a strong flagship project for the future of the lab, and the administration's request would essentially end it. The President has proposed a nearly 10% cut to Fermilab's budget. Fermilab is our nation's only single purpose high energy physics lab, and I view the President's request as a slap in the face to the lab's legacy of scientific achievement.

Specifically, the administration's FY2013 budget for Fermilab is \$365,000,000, a \$30,000,000 cut from the current budget levels. The huge cut from Fermi's operations will have severe consequences for both staffing levels and their scientific program, which are inextricably intertwined.

Our national labs and the lack of commitment from the President for all forms of basic research at the other labs and other programs is similarly disheartening.

Moreover, it's not as if the President is proposing to cut spending across the board and science and NASA happen to be a casualty; no. The President is still trying to grow government and increase spending by hundreds of billions of dollars; he just happens to be proposing cuts to one of the few productive areas of government to pay for his expansion. And that is shameful.

And it's shameful because High Energy Physics and our broader scientific portfolio go beyond parochial interests and local politics; these endeavors are inextricably linked to both our national success and, fundamentally, our national character. Unfortunately, in addition to the President proposing cuts to High Energy Physics and Fermilab, he's also shown lukewarm

support for the Department of Energy's Office of Science, all while his political pet projects like Solyndra style green energy gambles receive 30% increases.

And it's on this point that I think a constituent physicist of mine phrased it best: science is divided into "Edisonian" science – the research that leads to light bulbs and other tangible inventions – and "Einsteinian" science that not only seeks answers to questions about the nature of our world, but also provokes new questions.

American free enterprise and the private sector do an outstanding job of the Edisonian science, and our national labs have done an incredible job of the fundamental Einsteinian science. However, the President's budget sacrifices "Einsteinian" science at the political altar of trying to compete with the private sector and pick market winners.

Science requires a certain infrastructure. And the President's budget undermines the core part of this infrastructure; a part of the infrastructure that drives long-term economic growth and innovation. It is no accident that our investments in these various NASA and science endeavors in the 60s and 70s lead to that generation of adolescents creating companies like Microsoft, Apple and Amazon in their adult years. I fear our short sightedness now will cost us the leading companies of the future.

The U.S. research system is unique. We've found an incredibly powerful combination, wedding education and research by incorporating universities, user facilities and Department of Energy resources. With a pedigree spanning over half a century, it is self-evident that this basic research drives our understanding of the universe and our economic growth. These are new ideas and new innovations that spawn new products, new services, new companies and new industries.

But this system is only as stable as our commitment to it, which is why sustained and predictable research funding is crucial. The 2007 reorganization under America COMPETES was a good first step, but Congress must redouble its efforts to provide a clear, predictable, long-term path mapping out the seriousness of our investment. The President's budget represents a backward trend in this front.

With growing competition from overseas and economic uncertainty here at home, it is more important than ever that we reinforce our national commitment to basic research. Our long-term success in economic innovation, problem-solving, and inspiring future generations of Americans depends on it.

Europe now leads us in physics, China leads us in solar technology, India leads us in job creation, and we rely 100% on the Russians to get us into space. To say this concerns me is an understatement. I believe the seed corn for turning all of this around is our investment in both basic research and NASA's exploration. The President's budget request, however, undercuts both of those activities by sacrificing our seed corn to his political talking points. We must not let this continue.

Minority Views of the Democratic Caucus of the Committee on Science, Space, and Technology on the FY2013 Budget Request

We are pleased to see that the President's budget for FY2013 continues to propose investments in this Nation's future even as it takes steps to reign in the government's long-term deficit challenge. All of us believe that investing in the future of America—in its infrastructure, in research and innovation, and in the education of our children and workforce—represents the most important step the Federal government can do to ensure long-term economic success for the American people.

Cutting these investments would be detrimental to our capacity to balance the budget in the long-term and to sustain a high quality of life. Imagine parents who are able to send their children to college but choose not to do so because they want to cut back on family expenses. Based on average outcomes, such a decision would consign those children to a lifetime of reduced earnings—the latest census finds that annual earnings for a college graduate are approximately \$51,000 while those for a high school graduate are just \$28,000. So it is with the Nation. Balancing the budget through cuts to investments in infrastructure, education, and research and development would leave us poorer as a society with a harder road towards meeting our debts and growing our economy.

Therefore, we cannot support the Majority's Views and Estimates that are being submitted to the Committee on the Budget.

One overarching problem with the Majority's Views and Estimates is their lack of consistency on the issue of basic research versus technology investments. It seems that the only programs the Majority supports are basic research, except when the applied technology program—for example at NASA or in DOE nuclear technologies—involves a program they like. Our view is that a broad and balanced portfolio of investments, at all levels of research and development and across the full range of fields is a necessary condition for a robust national science and engineering enterprise. While we certainly prefer some investments over others, we have no ideological blinders when it comes to seeking benefits for the American taxpayer or American business.

Our view is informed by an appreciation that this country's economic success has always hinged on a creative interaction between government and the private sector. America's historical approach towards economic development has been pragmatic.

Government—whether at the local, State, or Federal level—has taken steps to encourage private capital to support public goals and has used its revenues in part to make investments that will support private initiative. This approach represents neither a managed economy nor free-wheeling markets. Instead, public interest and private interest work together for mutual benefit, and the result has been one of the great economic miracles of the modern age.

Reflecting on the elaborate systems that tie our communities together into the most

accomplished and dynamic country in the world, there is not a single system that has not involved significant government actions to improve its effectiveness of safety. Our Nation's entire infrastructure--its ports, airports, national airspace, railways, waterways, roads and highways, drinking water and sewer systems, telecommunications systems, information systems, and energy distribution systems have been established and maintained through collaboration between private capital and government. Increasingly, successful public-private collaborations in all of those areas have benefited from federal investments in science and technology.

We thus strongly encourage the Budget Committee to work to find the space in the budget to protect a diverse, robust, and wide-ranging set of research and development activities, and science, technology, engineering, and mathematics (STEM) education programs. Despite claims to the contrary, there is no evidence that any of the programs called out for cuts in the Majority's Views and Estimates are duplicative or ineffective or stray beyond the bounds of what Congress authorized agencies to do. While some of us have differences with the Administration on specific programs and activities, we endorse in the strongest possible terms the Obama Administration's budget request for the broad budget functions used by the Budget Committee for the purposes of meeting your obligations under the Budget Control Act.

We include some specific comments regarding agency-level issues as part of these Minority Views and Estimates. While we appreciate that some of these comments are at too fine-grained a level to inform your work, we include this material to help elucidate some areas of concern or disagreement with the proposed budget or with comments made by the Majority.

PROGRAMMATIC COMMENTS ON THE FY2013 BUDGET FOR SCIENCE AND TECHNOLOGY

Science, Technology, Engineering, and Mathematics (STEM) Education

In December, the Office of Science and Technology Policy (OSTP) in the Executive Office of the President released an inventory of Federal STEM programs required by the *America COMPETES Reauthorization Act of 2010*. In total, 13 agencies reported 252 distinct investments in STEM education for a total of \$3.4 billion in FY 2010. OSTP will complete its detailed STEM strategic plan this spring. A recent GAO report, requested by Chairmen Kline and Hunter, is consistent with OSTP's findings and expresses support for OSTP's STEM education strategic planning and evaluation efforts.

Due to the phasing out of a large program at the Department of Education (ED) and the consolidation, and/or phasing out of a number of smaller programs across the government, the total request for FY 2013 is \$2.95 billion, a 2.6 percent increase from FY 2012. The total number of programs in FY 2013 would stand at 209. We support this overall level of funding as well as OSTP's ongoing effort to evaluate and lead a

reorganization of these important activities.

Of the approximately \$3 billion in federal funding for STEM education, one-third is spent on activities--primarily scholarships and research experiences for undergraduate and graduate students--that specifically target the unique workforce needs of science mission agencies. As the current wave of retirements at our federal science agencies continues to be a challenge for these agencies, we support full funding for these STEM workforce development programs.

Of the remaining \$2 billion spent on broader STEM education, much less than \$1 billion is targeted to K-12 learning audiences and K-12 teacher professional development. The remainder is directed to strengthening STEM education and opportunities in higher education and to education research at the National Science Foundation (NSF) and ED. Approximately \$1 billion of the total across program types and audience levels is spent on activities with the primary goal of targeting groups that are underrepresented in STEM. We go into this level of detail primarily to serve as a counterpoint to the Majority's tendency to imply that the Federal government is spending \$3 billion on K-12 STEM education alone.

A number of the mission agencies, including the National Oceanic and Atmospheric Administration (NOAA), the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the National Aeronautics and Space Administration (NASA), take 20 percent or larger cuts to their respective STEM education budgets, while ED would see a 21.5 percent increase and NSF would see a 3.4 percent increase. Until OSTP's STEM strategic plan is available for review and evaluation, it is hard to offer specific guidance on agency-by-agency STEM funding levels. However, as a general matter, the Committee has had concerns in the past about over-reliance on ED for STEM initiatives because of its history of checkered accomplishment in this area. We are aware of Secretary Duncan's passion for this issue, but we are also mindful of organizational interests and limits that tend to outlast even the most inspiring of Cabinet Secretaries, and that leads us to believe that agencies with a stronger track record might be better positioned to keep these STEM initiatives going.

National Science Foundation (NSF)

Overall, the NSF budget request would see a 4.8 percent increase to \$7.37 billion, including a 5.2 percent increase for Research and Related Activities (R&RA) and a 5.6 percent increase for Education and Human Resources (EHR). This is the first time in recent memory that EHR will see a greater relative increase than R&RA. We support these funding requests. Also for the first time in memory, NSF is requesting a flat budget for its Agency Operations and Awards Management. We support this request with some reservations about the agency's ability to find such savings in operations after several years of flat funding while the research budgets have grown. We support the proposed budget for ongoing construction of the National Ecological Observatory Network (NEON),

as well as the funding for the remaining major research facility construction projects.

We note the Majority's concerns that NSF needs to better explain the rescoping of the Science, Engineering and Education for Sustainability program. However, we remain supportive of NSF's role in fundamental research on the environment and sustainability science and engineering, including areas of research critical to understanding, predicting, and responding to global climate change. We believe that NSF's level of support in these areas of research is appropriate given both the challenges and NSF's mission.

The Innovation Corps (I-Corps) program is a public - private partnership that connects NSF-funded researchers with the technological, entrepreneurial, and business communities to help identify basic research that could be used as emerging technology concepts that hold the promise of transitioning, after several more steps, into new companies and jobs. The Majority calls this picking winners and losers; we could not disagree more. I-Corps sits on the boundary of the core mission of NSF to support basic research. But it fills a much-needed gap that no other agency is better suited to fill and that the universities themselves are too cash-strapped to fill. We support the proposed level of funding for I-Corps.

NSF is proposing significant changes for its Education and Human Resources Directorate, including realignment of the four subdivisions of EHR and creation of two new cross-directorate initiatives: Expeditions in Education and the Core Launch Fund. At the same time, NSF is proposing flat funding for several STEM education programs that are long-standing priorities of this Committee, including the Noyce Teacher Scholarship Fund, the Math and Science Partnerships program, the Advanced Technological Education program, and the full suite of programs targeted primarily to broadening participation in STEM. We are particularly concerned with the significant cut to informal STEM education at a time when every science mission agency is also proposing cuts to its respective informal STEM education activities.

We support NSF's ongoing efforts to strengthen the quality, coherence, focus, and management of EHR programs. The Expeditions in Education initiative will strengthen the collaborations between EHR and the R&RA Directorates, and between EHR and other agencies, in particular the Department of Education. We reiterate our concern, however, that collaboration not lead to an increasing role for ED at the expense of NSF. The Core Launch Fund is consistent with a House-passed provision in the *America COMPETES Reauthorization Act of 2010* that called on NSF to work with the research community to define grand challenges in education research and to make those grand challenges a priority in their education research portfolio. Having said that, we believe that \$20 million seems excessive for this effort and some of those funds might be put to better use in increasing support for the previously mentioned ongoing programs that have been cut or held flat.

National Aeronautics and Space Administration (NASA)

Successive NASA Authorization Acts have directed that NASA implement a balanced portfolio of science, aeronautics, human spaceflight, and that NASA pursue a stepping stone approach to human exploration of the solar system that includes the Moon, near-Earth asteroids, Lagrangian points, and Mars. The overall funding level in the FY 2013 NASA budget request, while lower than a number of our Members think is needed, is reasonably good in light of the overall budget constraints. However, some of our Members are concerned that the mixed signals about programmatic priorities shifting from last year to this year need to be clarified and raise concerns about how priorities are being set for the Agency and what the Agency most hopes to achieve.

The Administration request would fund NASA at a level of \$17.7 billion, a \$58.6 million reduction from the FY 2012 appropriation (when the \$30 million rescission is included). NASA indicates that the FY 2013 budget request is designed to fund the agency's stated priorities and major elements of the NASA Authorization Act of 2010. Within that total amount, NASA's Science program is cut by \$162.5 million, or about 3.2 percent from the FY 2012 appropriated amount and within the Science account, the funding for Planetary Exploration is cut by \$309 million or about 21 percent; funding for Aeronautics is cut by about 2 percent; funding for the Space Launch System/Multipurpose Crew Vehicle (SLS/MPCV) is cut by several hundred million dollars or about 12.5 percent; NASA's Education program is cut by \$36 million or about 26 percent; and funding for the institutional needs of the agency and its field Centers is cut by almost 5 percent. The account that is increased the most in the budget request is the Commercial Crew Program, whose budget would more than double (from an FY 2012 appropriation of \$406 million to a requested level of \$830 million). In addition, the Space Technology account (which includes SBIR/STTR as well as technology R&D programs) would be increased by about \$125.3 million (21.8 percent). When compared to the NASA Authorization Act of 2010, both the proposed cuts and the proposed increases are inconsistent with the Act's authorization levels for the accounts mentioned above.

Mars Exploration. In the area of Mars exploration, the Administration is signaling a significant departure from prior plans. The FY 2013 budget request for Mars exploration is \$361 million, a \$226 million decrease (about 39 percent) from the amount appropriated in FY 2012. More significantly, projections for future year budgets show even more drastic reductions. NASA has indicated it will no longer participate with the European Space Agency in previously agreed-to collaborative Mars missions in 2016 and 2018 and has initiated an analysis of how it can implement an integrated strategy for long-term human and robotic exploration of Mars. We are concerned that this course of action will result in a stand-down in developing Mars missions, or at least those that address top scientific priorities, and could also result in a loss of highly critical capabilities in landing and operating spacecraft on Mars, a capability that at present only the United States possesses. We are also concerned about the potential negative message we send to our long-term partners by stepping back from planned collaborations on joint missions with them, especially at a time when fiscal pressures argue for increased and enhanced

international collaboration in undertaking challenging missions.

Human Spaceflight and Supplying the International Space Station (ISS). The Administration's funding request for development of a Multipurpose Crew Vehicle (MPCV) and a Space Launch System (SLS) is hundreds of millions of dollars less than the amount appropriated in FY 2012 and significantly below the authorized amounts for those programs in FY 2013. Making such cuts is typically not consistent with providing programmatic stability to an ongoing vehicle development program. NASA indicates that the FY 2013 funding requested for the MPCV and SLS, coupled with projected funding through FY 2017, will enable the agency to conduct unmanned test flights in FY 2014 and 2017. Despite direction in the NASA Authorization Act of 2010 that the MPCV/SLS system be developed on a timetable to allow it to serve as a back-up transportation system for crew and cargo to the ISS, NASA so far has taken no steps nor allocated any funding to address that Congressional requirement.

As noted above, the request for development of commercial crew transportation capabilities to low Earth orbit and the ISS is more than twice the FY 2012 appropriation level and \$330 million higher than that authorized for FY 2013. This increased request for commercial crew development comes shortly after conferees noted in the Joint Explanatory Statement accompanying the FY 2012 appropriations that "significant unanswered questions remain about the long-term viability of the commercial space market" and provided \$406 million for FY2012, less than half the requested amount for that year. NASA has not yet provided an independent cost and schedule estimate for its commercial crew program.

National Institute of Standards and Technology (NIST)

The FY 2013 budget for NIST includes an increase of \$106.2 million (14.1 percent) from FY 2012.

Manufacturing. More than half of the proposed increase in funding would be focused on advanced manufacturing research. As part of this expanded focus on manufacturing, the budget proposes the creation of the Advanced Manufacturing Technology Consortia (AMTech) which would be focused on the creation of industry-led public-private consortia to identify research projects supporting long-term, precompetitive industrial research needs in advanced manufacturing. AMTech was first proposed as part of the FY 2012 budget, but was ultimately not funded by Congress. We believe that the Majority has not been supportive of the concept due to concerns about the appropriate role of the Federal Government in funding research by the private sector. The budget also proposes \$1 billion in mandatory funding to NIST for the establishment of a National Network for Manufacturing Innovation (NNMI). The budget describes NNMI as collaboration between NIST, the Department of Defense, the Department of Energy, and the National Science Foundation to promote the development of manufacturing technologies with broad applications. While we await more details on this collaborative proposal, as a general

matter we strongly encourage the Budget Committee to provide sufficient allocations to fund manufacturing technology initiatives designed to create American jobs and support American businesses.

Cybersecurity. The budget request for FY 2013 once again supports NIST's important cybersecurity activities. We strongly support NIST's longstanding responsibilities relating to cybersecurity and remain committed to ensuring that NIST's technical expertise in this area, particularly as it relates to the development of cybersecurity standards and guidelines for Federal agencies and U.S. industry, continues to be an integral part of the Federal Government's cybersecurity efforts.

Forensic Science. Since the release of the National Research Council's report on forensic science more than three years ago, we have been committed to improving forensic science in the United States and have been particularly interested in identifying the appropriate role for NIST in accomplishing this goal. For this reason, we are pleased that the FY 2013 budget request focuses on enhancing the scientific validity of forensic evidence and enabling reliable and accurate forensic practice through the development of new measurement tools and stronger measurement methodologies.

Technology Innovation Program. Our Members are disappointed that, for the first time in 25 years, NIST will not be operating a program providing early stage investment to accelerate the development of innovative technologies with the potential for significant commercial payoffs. While we understand that the decision to end the Technology Innovation Program (TIP) was forced upon NIST by Congress in the FY 2012 appropriations bill, we are concerned about the void created by the termination of this promising program and its future implications for economic growth and jobs. We hope to work with the Budget Committee, our other colleagues in Congress, and the Administration in finding an appropriate replacement for TIP as soon as possible.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration's (NOAA) budget request for FY 2013 is \$5.1 billion, a 3 percent increase (\$154 million) over the FY12 enacted levels. The President's Request for NOAA reflects numerous tough choices, resulting in program terminations and budget cuts that include cutting the NOAA Education Program by more than half (a \$14 million decrease) and terminating the National Mesonet.

Satellites. The bulk of the NOAA increase is for the Procurement, Acquisition, and Construction of the Geostationary Operational Environmental Satellite – R Series (GOES-R), which gets a \$186 million increase. GOES-R is scheduled to be launched in 2015. There is a decrease of \$34 million for the Joint Polar Satellite System (JPSS), formerly the National Polar-orbiting Operational Environmental Satellite (NPOESS) and its climate sensors. We understand and support the necessity of this ramp-up in funding for GOES-R in order to ensure that it is ready for launch by 2015. However, we remain

concerned about ensuring adequate funding requests to keep JPSS-1 on track, as well as the potential data gap between the current Suomi National Polar-orbiting Partnership (Suomi NPP) satellite and the launch of JPSS-1.

National Weather Service. The National Weather Service is the only line office within the agency to receive a significant decrease in funding. In the FY 2013 budget request, NWS receives a \$30 million decrease in the operations and research budget for local warnings and forecasts during a time of increased severe weather around the country.

While we generally support the President's request for NOAA, we are concerned that funding for the NWS and JPSS may be insufficient to meet the Nation's needs and provide the best warnings and forecasts, but we must await more details from the agency before we can make a final decision on these specific requests.

Environmental Protection Agency (EPA)

The EPA R&D account includes a modest \$8 million increase that reflects investments in many of our Committee's priorities. The Science and Technology account shifts priorities, with increases in some areas and decreases in others. The proposed decreases will still allow EPA to maintain much of its intramural research activities.

Despite claims in the Majority's Views that they have conducted oversight revealing weak science at EPA, the record reviewed to date largely reveals that EPA's problems with science have been a result of underfunding of its research enterprise and lack of a sufficient degree of independence to carry out its day-to-day activities. No facts that have been brought before the Committee would lead to a reasoned conclusion that the way to fix EPA is to cut its science budget. We support the Administration's request for EPA's R&D account.

Department of Energy (DOE)

We understand that prioritization is important in a time of fiscal austerity. This theme appears to be reflected throughout the Department of Energy's budget as a number of programs are slated to sustain large cuts while others see significant boosts in support. This is a significant departure from budget requests of recent years which typically included steady increases of varying degrees for most programs. In fact, the overall request of \$27.1 billion for DOE is considerably less ambitious than last year's request of \$29.5 billion. Generally, we agree with the budget's shift towards more of a focus on emerging "clean" energy technology research, and less of a focus on technology development for the conventional and commercially-mature energy sectors. However, we do not agree that this is the appropriate time to make substantial cuts to fundamental basic research activities within the Office of Science, and we urge the Budget Committee to allocate sufficient funding to sustain the research communities and world-class facilities it supports.

Our over-reliance on foreign, heavily-polluting, and finite sources of energy and on a rapidly aging energy infrastructure threaten our national security, economic well-being, and environmental health, as well as our standing as the world leader in technology development. Now, more than ever, it is critical for the U.S. to invest in an energy research and innovation system that matches the scale and complexity of the energy challenges we face. The path is simple. Federal investment in research leads to technological innovation, which in turn leads to economic development, well-paying jobs, and a more sustainable future.

The DOE Office of Science is the nation's primary supporter of basic research in the physical sciences, operating 10 of DOE's National Laboratories, and supporting roughly 25,000 government, academic, and industry researchers from all 50 states in facilities both here and abroad. It supports research in fields as diverse as materials science, biology, nanotechnology, plasma science, and supercomputing – all of which are essential to the development of advanced energy technologies - as well as fundamental research in particle and nuclear physics. The Office of Science oversees the construction and operation of some of the world's most advanced R&D user facilities, including supercomputers, particle accelerators, x-ray light sources, and neutron scattering facilities that enable the examination of materials and chemical processes for a wide range of industrial and basic energy research applications. We are concerned that a number of cuts proposed in this budget will force these facilities to reduce, suspend, or terminate operations, and thus greatly hinder our ability to maintain U.S. technological competitiveness, develop new energy solutions, and educate the next generation of scientists, innovators, and technicians.

We support the request for the Office of Science's Biological and Environmental Research (BER) and feel strongly that its activities are consistent with the Department's mission. BER focuses on generating breakthroughs in biological system science critical to development of biomass-based liquid transportation fuels, biobased products, and bioenergy. Furthermore, BER conducts research to understand the fundamental science associated with climate change, as well as DOE's environmental challenges related to legacy nuclear waste management. Congress authorized DOE to conduct climate research in the Global Change Research Act of 1990. As with the other agencies in the US Global Change Research Program, there are unique and indispensable technical and scientific capabilities found only at DOE. Furthermore, in its charge to support the development of a national energy system that is both secure and environmentally sound, the Department must anticipate the effect of these systems on the future global climate. We do not agree that climate change is a subject unworthy of study and reasoned action based on knowledge.

Investments in the Office of Energy Efficiency and Renewable Energy serve to strengthen U.S. scientific and economic leadership by advancing innovation in a range of technology areas, supporting the next generation of scientists and technology leaders, seeding the industries of tomorrow, and ultimately laying the groundwork for a cleaner, more

sustainable energy future. We do not agree with those in the Majority who think that increased investments in energy efficiency or in non-fossil fuel sources of energy are ill-considered. We recognize that precious taxpayer dollars are better leveraged in a constrained budgetary environment by increased investment in research on the clean energy technologies that EERE focuses on, and less on the conventional energy sectors that have already enjoyed decades of government support and resulting commercial success. While we commend the Administration for prioritizing its innovation programs by shifting some resources away from commercially-mature areas within EERE, we are concerned that additional cuts to EERE would limit the program's ability to pursue emerging research areas, and ultimately do lasting harm to our ability to meet our energy objectives and compete in the global marketplace.

Every Member feels the pressure to act to bring down energy prices now and insulate our economy from future price shocks. With less than 8% of technically-recoverable global oil reserves, the U.S. cannot drill its way to energy independence, regardless of the technological advances in drilling. Furthermore, oil, gas, nuclear, and coal have benefitted from decades of direct taxpayer support and are now among the most profitable industries in the world. Members recognize the value of these industries to the U.S. economy, and understand that some continued taxpayer-funded research can yield improvements in efficiency and environmental impact. However, Democratic Members believe that a better balance must be achieved within the DOE research portfolio.

It is also time to take seriously the need to modernize our energy infrastructure and transition away from outdated technologies. We have extended the lifetimes and stretched the infrastructure's capacity to the point where massive new investments will be needed in the near future. We understand we must take this opportunity and leverage our resources to transition to a new, cleaner, more efficient, and "smarter" energy grid that gives both energy suppliers and consumers more control, and therefore we support the President's request for the Office of Electricity Deliverability and Energy Reliability.

Finally, ARPA-E has been an undeniable success. If allowed the time and resources to thrive, ARPA-E may well represent the first of a new generation of smaller, more agile and effective, and more efficient research programs. ARPA-E is oversubscribed, seeing far more good ideas than it can afford to sponsor. For ARPA-E to be effective, it must continue to grow beyond its relatively modest current level of \$250 million, and because of its structure it is well-suited to do so. Therefore we support the proposed increase in the President's budget request.

Department of Homeland Security (DHS)

The FY 2013 budget for the Department of Homeland Security's Science and Technology Directorate is \$831.5 million, a \$163.5 million (24.5 percent) increase over FY 2012 levels. This funding level would return the S & T Directorate to its FY 2011 funding level, which was still \$180 million less than the funding level in FY 2010.

As the Directorate has experienced sharp decreases in funding in recent years, it has been forced to prioritize some research areas over others and fund only its top priorities (biological defense, cybersecurity, explosive detection, and first responder technologies) with its limited resources. With the proposed increase in funding, the Directorate has identified a number of additional priorities (border security, chemical attack resiliency, counterterrorism, and information sharing and interoperability) as areas for which it will resume funding.

We support the level of the President's request and believe that the Congress should expand DHS's research enterprise back to its FY2011 level with an eye to stabilizing it in that range for the coming years. The yo-yoing of funding that has occurred to date is disruptive to the agency and damages its research enterprise.

Department of Transportation

Research and development at the Department of Transportation (DOT) has historically often been conducted in a stove-piped manner, meaning that research projects are very specific to the needs of a specific mode (i.e. railroads, freight, or mass transit). The stove-piped nature of DOT research has resulted in research gaps, duplication, and a fragmented national agenda. Our Committee has tried to improve the coordination of research across DOT's components through the establishment of the Research and Innovative Technology Administration (RITA). While RITA is charged with coordinating DOT's research programs and advancing the deployment of cross-cutting technologies, its impact has been limited in part by a lack of prominence within DOT. The President's FY2013 budget request proposes to address these concerns by transforming RITA into a new office, the Office of the Assistant Secretary for Research and Technology within the Office of the Secretary, funded at \$14 million. According to the proposal, this will strengthen research functions across DOT by providing a prominent centralized focus on research and technology. We certainly support these goals and look forward to learning more about the proposal. We remain committed to ensuring an effective and coordinated research strategy at DOT.

Economic Development Administration

The FY 2013 budget also requests \$25 million in dedicated funding for the Regional Innovation Strategies Program at the Economic Development Administration (EDA). This program, which was authorized in the *America COMPETES Reauthorization Act of 2010*, will encourage the development of new businesses, products, or services through strategic investments that help communities leverage their regional assets to spur innovation. Although dedicated funding was also requested for this program in FY 2012, Congress chose instead to require EDA to support these activities out of its Economic Adjustment Assistance (EAA) account. We strongly support the request for a separate account line for the Regional Innovation Strategies Program. A distinct line of funding will enable EDA to carry out this program as intended

in the *America COMPETES Reauthorization Act* without being unnecessarily constrained by the limitations inherent in the EAA program.

Minority Views of the Democratic Caucus of the Committee on Science, Space,
and Technology on the FY2013 Budget Request

Eddie Bernice Johnson

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April Woberg

Jay M. Costello

Jay McMy

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Frederica S. Wilson

Leri Jewell

Paul D. Towler

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Burt Hill

Hansen Clarke

Donno F. Edwards

Gene Branic

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**Minority Views of the Democratic Caucus of the Committee on Science, Space,
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John P. Sarbanes

Additional Views on the FY2013 Budget Request
Representative Zoe Lofgren

I wanted to submit additional views regarding the President's budget for Fiscal Year 2013.

The Administration has made an effort to invest smartly in science and technology; however, I am troubled by the potential impact of the Department of Energy (DOE) National Nuclear Security Administration's (NNSA) budget on domestic inertial confinement fusion research. The National Ignition Facility, located at Lawrence Livermore National Laboratory, is a basic science project that has enjoyed bipartisan support for many decades. It is the leading inertial confinement fusion experiment in the world and plays an important role in the stewardship of the nation's nuclear weapons, for the advancement of science and potentially for energy. China and Russia have accelerated efforts to compete in inertial confinement fusion but remain behind this premier U.S. effort.

Below is a letter from NIF that highlights the detrimental results of these proposed budget changes:



March 7, 2012

The Honorable Zoe Lofgren
U.S. House of Representatives
1401 Longworth House Office Building
Washington, DC 20515

Subject: Implications of the President's FY2013 budget and language on the NIF and Laser Fusion Program

Dear Representative Lofgren,

This is in response to your request regarding the effect of the President's FY13 budget guidance on the National Ignition Facility and the Laser Inertial Confinement Fusion program for our nation.

The result would be profound and negative.

In the President's budget there are two key directions reducing the funding of the Ignition Program at LLNL by \$30,000,000 and eliminating the Self-Constructed Asset Pool (SCAP) overhead rate at LLNL.

The \$30,000,000 funding reduction will result in the termination of approximately 100 highly trained staff jeopardizing our ability to support the Stockpile Stewardship and fusion energy missions for the nation. The elimination of the SCAP rate (without appropriate funding adjustments) will result in an additional reduction in spending power of approximately \$140,000,000 and would, to first order, result in the elimination of the inertial confinement fusion program at NIF. The NIF staff would be reduced by another 450 key scientific, engineering and operations staff and NIF would be placed in a standby condition. Additional collateral damage would include the loss of the capabilities of key industrial high technology partners that we have cultivated over the last 30 years who are world leaders in these technologies.

This is occurring as we are on the verge of long-awaited ignition milestones and most importantly as France, China and Russia are following our nation's lead in building NIF-like laser fusion facilities.

We are in conversations with NNSA to understand their intent and to explore what could be done to mitigate this very unfortunate situation.

Sincerely,

Edward Moses
Director, National Ignition Facility

Fusion energy has the potential to become a game-changer in our efforts to reduce our dependence on dirty fossil fuels. In order to achieve practical fusion, though, we must have a robust fusion research program. I am concerned that the President's NNSA budget proposal may have a mothballing effect on NIF and inhibit the progress of domestic inertial confinement fusion research.

Additionally, the Department of Energy has yet to adequately justify the budget's reductions to the High Performance Computing and Network Facilities subprogram under the Advanced Scientific Computing Research program, and I continue to have concerns regarding this proposal.



Zoe Lofgren
Member of Congress

MARCIA L. FUDGE
11TH DISTRICT, OHIO

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SUBCOMMITTEE ON CONSERVATION,
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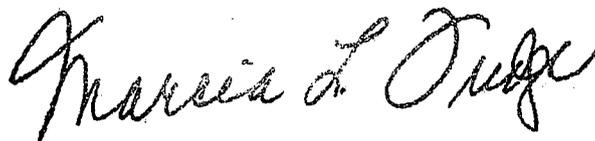
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March 8, 2012
Additional Views on the FY2013 Budget

Though I agree, for the most part, with the Minority Views of the Democratic Caucus of the Committee on Science, Space, and Technology on the FY2013 Budget Request, I must state my difference of opinion on the proposed NASA budget. I believe that the President's Budget Request sets forth the plan needed to develop a robust space and aeronautics industry in the United States. By leveraging private sector funds with federal investments, we will increase our national competition and progress.

However, what is most important to me and my constituents is the proposal's focus on research and development (R&D) within the agency, specifically that within the Space Technology account. I believe that we are at a critical time in our history where technology and innovation represent the future of our country. It is the role of the federal government to invest in a diverse portfolio of basic R&D that will carry our space and aeronautics industry forward. If we truly want to build the vehicles of the future, we must make these investments now. I urge my colleagues to protect funding for space technology in the proposal for the sake of our global leadership and future prosperity.

Sincerely,



Marcia L. Fudge
Member of Congress