

**Oral Testimony of Dr. John P. Holdren**  
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**Executive Office of the President of the United States**  
**to the**  
**Committee on Science and Technology**  
**United States House of Representatives**  
**on**  
**Research and Development in the President's Fiscal Year 2011 Budget**  
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Chairman Gordon, Ranking Member Hall, and Members of the Committee, It is my privilege to be here with you today to discuss the Research and Development and science, technology, engineering, and mathematics education components of the President's FY2011 Budget. I have submitted a detailed written statement, so here I will just summarize a few key points.

The Obama Administration is working hard to keep the Nation on the path out of recession through recovery and into a new era of revitalized growth. This means sparking job creation to get millions of Americans back to work, and it means building a new foundation for long-term prosperity that will reach every American family.

A crucial element of this effort is the targeted investments we're making in science, technology, and innovation that will lead to new products and services, new businesses and industries, increased American competitiveness, and high-quality, sustainable jobs.

Our strategy includes investments in fundamental and applied research and development that will lead to better technologies – and the jobs that will go with them – for advanced manufacturing, for clean energy, for health care, for environmental protection and remediation, and for national and homeland security. It includes increased use of public-private partnerships to speed up innovation and get the results more rapidly into the marketplace.

It calls for exploration and discovery from the depths of the oceans to the frontiers of space, expanding our knowledge of our world and our universe while igniting the curiosity and ambitions of our young people. And it includes a focus on STEM education that will support and sustain rather than stifle that curiosity, so we can cultivate the next generation of innovators, along with the tech-savvy workforce that competitiveness in the 21<sup>st</sup> century requires.

Obviously, we need the continued support of the Congress to get it done. But if there is one message I most want to convey in my comments today, it is that the investments outlined in the President's R&D budget are at the very core of America's future strength. So I look forward to working with all of you to make sure—at this very important time in American history, when competition abroad is growing and the stakes

are ever increasing—that we put America on a path that keeps this Nation great for our children and grandchildren. A path that is built on scientific evidence, on technical progress and prowess, and on a nation of people who are inventors, innovators, and makers, not just consumers.

Now, let me give you a very brief bird's-eye view of the FY 2011 R&D Budget, with elaboration on just a few highlights:

The President's 2011 Budget proposes a record \$61.6 billion investment in civilian research and development, an increase of \$3.7 billion or 6.4 percent over the 2010 funding level. These increases are counterbalanced by some reductions in defense development funding and earmarks, such that the combined defense and nondefense R&D budget would be \$147.7 billion, just 0.2 percent above the 2010 enacted level. This would be a cut of 0.9 percent cut after adjusting for projected inflation. I think this is a smart R&D budget, one that is fiscally responsible over all, with some important, targeted increases where investments today can do the most good tomorrow.

Among the highlights, let me first note that the 2011 Budget reflects the President's commitment to double the budgets of the National Science Foundation, the DOE's Office of Science, and the National Institute of Standards and Technology laboratories. The President's Plan for Science and Innovation and the America COMPETES Act have identified these three agencies as key to the fundamental research that underpins our nation's future prosperity – and which the private sector won't do enough of because the risks seem too high or the returns too far in the future. Last year, this Congress and this Administration worked together to put these agencies back on a doubling trajectory that had faltered in the previous Administration, and the FY2011 budget maintains that trajectory with a 6.6 percent increase for their combined budgets.

I also want to highlight the Department of Energy R&D portfolio, which totals \$11.2 billion, representing an increase of 3.8 percent in real terms. That includes \$300 million for the Advanced Research Projects Agency-Energy (ARPA-E) that was authorized in the America COMPETES Act to fund high-risk, high-reward research to yield revolutionary changes in how we produce, distribute, and use energy. ARPA-E announced its first set of grants last October and in 2010 will make additional awards with Recovery Act funds. The 2011 Budget will allow this groundbreaking program to make additional awards next year.

Separately, investments in DOE's clean-energy R&D programs will help reduce dependence on foreign oil and accelerate America's transition to a low-carbon economy with funding increases for solar energy, geothermal technology, energy-conservation building technologies, and nuclear energy.

Let me highlight as well some of our goals within the National Oceanic and Atmospheric Administration (NOAA), which plays a vital role supporting research on the Earth's oceans, atmosphere, and marine habitats. The NOAA budget of \$5.6 billion is an increase of \$806 million over the 2010 enacted level. This will allow NOAA to improve

weather and climate services that protect life and property, invest more heavily in restoring our oceans and coasts, and ensure continuity of crucial satellite observations of weather and climate.

I'd like to emphasize recent progress in this latter area. The large increase in the NOAA budget reflects a new architecture for the National Polar-orbiting Operational Environmental Satellite System (NPOESS), a tri-agency (NOAA, DOD Air Force, and NASA) program that has had a troubled history. Since last August, OSTP has led an Executive Office of the President Task Force that, in close cooperation with the partner agencies, has been investigating various options for how to place the NPOESS program on a pathway to success.

Earlier this month, the three agencies announced a plan to restructure the program – a plan reflected in the President's 2011 Budget. There will be a division of satellite acquisition but the three agencies will continue to partner in areas that have been successfully shared in the past, such as the program's ground and data systems. I can assure the committee that OSTP is actively engaged in overseeing the transition to the new structure of this crucial program.

There are many other items in the R&D budget worth highlighting, including support for activities in the Next Generation Air Transportation System (NextGen); the added \$1 billion for the National Institutes of Health to speed discovery of new treatments and cures for cancer and the other scourges; the added support for the Defense Advanced Research Projects Agency (DARPA) for research in high priority areas such as night vision, cybersecurity, enhanced GPS, and deployable force protection; the more than 25 percent increase in funding for environmental health and safety studies under the National Nanotechnology Initiative; and the significant increase in support for the multi-agency U.S. Global Change Research Program, mandated by Congress to improve understanding of uncertainties in climate science, expand global observing systems, and develop science-based resources to support policymaking and resource management.

But I want to focus on two other areas before my time is up. The first of these is NASA. Our U.S. space program represents not just a grand and inspiring adventure of exploration and discovery reaching outward into our universe, but also an indispensable platform for observing what is happening on the Earth below, a crucial element of our communications infrastructure and geopositioning capability; and a source of new products, services, businesses, and jobs whose potential is barely beginning to be tapped.

The FY2011 NASA budget proposes a science-and-technology centered restructuring of this country's space-exploration program that will invest in American ingenuity to enable us to do things in space that are more useful, more exciting, and more affordable than returning astronauts to the Moon's surface 50 years after we did it the first time, using the last century's technology. The new approach – which adds \$6 billion over the next five years for NASA – includes a vigorous technology development and test program that will begin to reverse decades of under-investment in new ideas. By extending the life of the International Space Station—likely to 2020 or beyond—it

increases the number of U.S. astronauts who will be working in space over the next decade; by supporting the development of private-sector capabilities to lift astronauts into low Earth orbit it will shorten the duration of our reliance solely on Russian launchers for this purpose; and by investing in new, game-changing technologies it gives promise of getting our astronauts to deep space destinations sooner, faster, safer, and cheaper than what could realistically have been achieved under the old approach.

Among the priorities included in this year's and out-year budgets for NASA are technologies to reduce the cost and expand the capabilities of future exploration activities, including in-orbit fuel storage and refueling; R&D on new launch systems and advanced deep-space propulsion; robotic precursor missions to scout exploration targets; re-flying the Orbiting Carbon Observatory (OCO); accelerating the development of other satellites; and continuing to increase our understanding of the cosmos through such projects as the follow-on to the Hubble Space Telescope.

Finally, a few words about STEM education. The President has been emphatic about his commitment, which I share, to increase the participation and the performance of American students in science, technology, engineering, and mathematics, aiming to improve our performance in comparison with other nations from the middle of the pack to the top of the pack over the next decade.

The 2011 Budget invests \$3.7 billion in STEM education programs across the federal government, including a \$1 billion investment in improving improve math and science achievement among K-12 students (an increase of over 40 percent in this category. The impact of these investments will be magnified by "Educate to Innovate", a campaign launched by the President to motivate and inspire young people to excel in STEM education. This campaign has already mobilized over \$500 million in financial and in-kind support from companies, foundations, universities, and nonprofits.

In addition to these investments, the 2011 Budget provides an additional \$1.35 billion in funding for Race to the Top, which provides a competitive advantage to states that commit to a comprehensive strategy to improve STEM education.

The investments in R&D and STEM education proposed in the President's FY2011 Budget reflect his clear understanding of the critical importance of science, technology, and innovation in addressing the most compelling changes our Nation faces, while respecting the need for overall budgetary restraint under difficult economic conditions. It is a budget intended to keep this country on a path to revitalized economic growth, real energy security, intelligent environmental stewardship, better health outcomes for more Americans at lower costs, strengthened national and homeland security, and continuing leadership in science and in space.

I look forward to working with this Committee to make the vision of the President's FY 2011 Budget proposal into a reality. I will be pleased to try to answer any questions the Members may have.