RALPH M. HALL, TEXAS
CHAIRMAN

EDDIE BERNICE JOHNSON, TEXAS
RANKING MEMBER

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
(202) 225–6371
www.science.house.gov

October 7, 2011

The Honorable Jeb Hensarling
Co-Chairman
Joint Committee on Deficit Reduction
129 Cannon HOB
Washington, D.C. 20515

The Honorable Patty Murray
Co-Chairman
Joint Committee on Deficit Reduction
448 Russell Senate Office Building
Washington, D.C. 20510

Dear Chairman Hensarling and Chairman Murray,

The Budget Control Act of 2011 [Public Law 112-25] included a provision stating that Committees could provide recommendations to the Joint Select Committee on Deficit Reduction. The Chairman of the House Science, Space, and Technology Committee has informed me that he does not plan to have our Committee submit any recommendations. However, I believe that it is important that Members of the Joint Select Committee have an appreciation of the important role that federal investments in research and development (R&D) play in stimulating growth, creating new industries and jobs—including for America's many small businesses, and delivering long-term benefits to our citizens. As Ranking Member of the Science, Space and Technology Committee, I strongly support continued federal investment in science and technology as an important component of any serious effort to achieve long-term deficit reduction.

Despite the United States' decisive victory in World War II and the initial realignment of world powers, it was not a given that the United States' rise to super power status would endure. The urgent needs of wartime galvanized our nation and our industries and rescued our economy from the Great Depression. But our rise to the status of unchallenged world leader in innovation had just begun. In the Cold War years following WWII, we faced an arms race with the Soviets and our government continued to make significant investments in defense R&D. Those investments strengthened not just our military, but also our economy. In particular, DARPA, which was created in

1958, is responsible for early development of some of today's most economically important technologies, including the internet. The space race of the 1950's also led to the 1958 passage of both the National Defense Education Act and National Aeronautics and Space Act, two critically important milestones in our post-war innovation agenda. NASA carries out important R&D across a number of fields, and the nation's space and aeronautics program is important not just for bringing the heavens into view, providing a very visible demonstration of American technological preeminence to peoples around the world, and inspiring generations of young Americans to pursue careers in science, technology, engineering, and mathematics (STEM), but also for many important technologies that it has developed or accelerated including such things as communication satellites, weather satellites, cordless tools, composite structures, and digital fly-by-wire technology.

That said, our government leaders also had the foresight to look beyond the arms and space races as they constructed the federal R&D enterprise. In response to the lack of capacity within industry to support long-term, fundamental research across all fields of science and engineering, Congress established the National Science Foundation (NSF) in 1950. NSF profoundly changed the academic research model from one in which industry was the primary supporter of university research—which limited the scope, duration, and impact of research projects—to one in which the federal government was the primary supporter, enabling our best and brightest minds to pursue long-term research with yet unknown applications. Just a few of the most economically important inventions that arose from NSF supported research are the bar code, fiber optics, nanotechnology, and (expanding on the work of DARPA) the internet as we know it today.

In response to the energy crisis of the 1970's, the U.S. reinvented and expanded its approach to energy R&D, establishing the Department of Energy (DOE) and initiating four decades of investment that has led to the development of entirely new, cleaner and more sustainable energy technologies while improving on the efficiency and safety of older technologies. Since its establishment, DOE and its partners have steadily advanced a range of clean energy technologies with only a fraction of the funding conventional energy resources have received. However, the unique demands of the energy marketplace with its deeply-entrenched incumbent technologies, technological barriers requiring breakthroughs in fundamental sciences, and very high capital costs, required us to reevaluate our government models for spurring innovations in energy. It became clear to many that in addition to increased support for the existing DOE basic and applied research programs, we also needed new, faster and more agile tools to match the demands of the rapidly shifting energy technology landscape. In 2007, Congress created the Advanced Research Projects Agency- Energy (ARPA-E) to accelerate research and development on high-risk, high-payoff energy technologies, and to do so in a way that is fundamentally different from the rest of DOE. With a streamlined, non-bureaucratic organization staffed by some of the best and brightest from academia and industry serving for limited terms, ARPA-E quickly set a new bar for efficiency and effectiveness in government research programs. Furthermore, ARPA-E shutters projects and recovers funding when technical targets are not met. Their portfolio of projects is already on-track to leverage more private sector follow-on funding than the original taxpayer investment.

And, as recommended by both the President's Council of Advisors on Science and Technology and the eminent industry-led American Energy Innovation Council, the management principles and practices of ARPA-E are being exported to other offices within DOE. ARPA-E is just one example of how DOE is being reinvented to work with academia and industry partners to drive American innovation and competitiveness in the global energy marketplace.

The National Institute of Standards and Technology (NIST) was founded in 1901 as the nation's first federal physical science laboratory. In addition to its traditional role as developer and protector of national standards of measurement and conductor of basic research in the physical sciences, NIST has increasingly been called upon to help industry use technology to improve product quality and reliability, improve manufacturing processes, and more rapidly bring to market products that use new scientific discoveries. NIST also administers the Malcolm Baldrige National Quality Award, which recognizes outstanding performance excellence and quality by U.S. businesses and other organizations, develops guidelines and criteria that can be used to evaluate quality improvement efforts, and helps to stimulate U.S. companies to improve quality and productivity.

Over the past week the 2011 Nobel Prizes have been announced. In physiology or medicine, one winner is American and another has been in the United States since coming here for his Ph.D. In physics, all three winners are American, one of whom is a scientist at the DOE's Lawrence Berkeley National Laboratory. In chemistry, the sole winner carried out his prize-winning research while on sabbatical at NIST. Because we made it possible for the most brilliant and creative minds from around the globe to explore their ground-breaking ideas in world-class research facilities at universities and national labs across the country, our nation has dominated Nobel prizes in medicine, physics, and chemistry since the end of WWII. However, while we are proud of our many Laureates, we also recognize that it is our universities' and national labs' roles as engines of our economy that should make us think twice about threatening their future with yet more funding cuts and uncertainty. Colleges and universities train our future STEM leaders and inventors, including those who will go on to build companies and create high-skills jobs. They also educate our young people who will fill those jobs.

For example, in my home state, the University of Texas is one of the largest employers. Its flagship institution is in Austin, which was recently ranked third in the nation (by Forbes magazine) as the best area to launch a business or a career. The Austin Technology Incubator (ATI), which has received funding from both DOE and the Department of Commerce, is a unit of the university's IC^2 Institute that aids the growth and development of emerging technology companies in Central Texas. Since 1989, ATI's graduate companies have created more than 3,000 jobs and generated $1.5 billion in revenue. Four of those companies have gone public on NASDAQ and more than a dozen have been acquired. ATI has had a significant impact on the development of Austin a recognized international hub for entrepreneurship.

More broadly, it is clear that federal investments in R&D bring significant returns for decades to come. In 1987, MIT Professor Robert Solow was awarded the Nobel Prize in Economics for his work proving that improved technology and improved education in the workforce was chiefly responsible for long-term growth, much more than increases in labor or capital. The current best estimate for the return on academic research alone is 28 percent. Federal efforts are underway now to more rigorously quantify the return on federal investments in R&D.

Today we find ourselves at a crossroads. The United States remains a leader in science, technology, and innovation, but no longer the unchallenged leader. While our own world-class innovation infrastructure is under stress, our competitors in other countries, even as they institute austerity measures in other parts of their budgets, are seizing the opportunity to make strategic investments in long-term basic research and build and leverage public-private partnerships to support shorter-term R&D that will help create jobs now and long into the future. As we struggle with our own deficits, we too can make the strategic choice to *continue* to invest in our future, both in our human capital and physical infrastructure – or we can make the strategic choice to permanently cede our leadership, to fail our current generation of young people, and to put our economy in a state of stagnation for years to come.

It is the responsibility of my Committee and others in Congress to conduct rigorous oversight of the federal R&D enterprise to ensure that budgets are invested as effectively and efficiently as possible. However, neither the agencies nor the scientific and engineering communities can plan or prioritize well given the often month-to-month funding uncertainties of recent years. Worse yet, the current uncertainties coupled with pessimism about their ability to secure funding into the future are turning some of our most brilliant young minds away from R&D careers. I urge you, as you undertake your very difficult task of trying to set us on a more sustainable fiscal path, to do whatever it takes to prioritize steady growth of our investments in science, technology, and STEM education. I recognize that continued investments in these areas have a cost, and that is why I also believe that it is critically important for the Joint Select Committee to include serious revenue enhancements in its set of recommendations. Failure to do so would likely lead to ill-advised pressures for cuts to the vital areas I have described in this letter. It is when our economy is hurting the most that we should be redoubling our efforts to innovate our way into a brighter future of new jobs, new technologies, and untold societal benefits.

Sincerely,

Eddie Bernice Johnson

EDDIE BERNICE JOHNSON
Ranking Minority Member