

**Statement of
Dr. John P. Holdren
Director-designate
Office of Science and Technology Policy
Executive Office of the President
for the
Committee on Commerce, Science, and Transportation
United States Senate
Washington, D. C.
February 12, 2009**

It is a singular honor and privilege to appear before this Committee as President Obama's nominee for Director of the Office of Science and Technology Policy (OSTP) within the Executive Office of the President. I contemplate the opportunity of serving in this capacity, if confirmed by the United States Senate, with a mixture of pride and humility.

I am proud to have been nominated by President Obama to work with him and the Congress to sustain and strengthen our world-leading science and engineering enterprises, which are so crucial to our economic prosperity, our security, and the quality of our environment, and to ensure the science and technology advice our policy-makers need is always the best it can be.

But I am also humbled by the magnitude of these tasks, as well as by the responsibility to live up to the standard set by the extraordinary line of distinguished scientists who have served in similar roles under Republican and Democratic Presidents since MIT's Vannevar Bush served as President Roosevelt's science and technology advisor in World War 2.

Science and technology policy consists of two major strands: policy for science and technology – namely, the policies related to strengthening the research and development enterprise in the public and private sectors, to science and technology education and training, and to fostering the conditions under which advances in science and technology are translated into economic, security, and environmental benefits for society at large; and science and technology for policy – meaning the use of insights from science and engineering in the formation of those parts of economic policy, defense policy, space policy, health policy, environmental policy, agricultural policy, and so on, where such insights are needed to help shape sensible policies.

OSTP has the great challenge of covering this wide and critically important terrain in the White House, and in interaction with other Executive Branch agencies and the Congress, with a modest staff and budget. This requires recruiting very high-caliber people both for the professional staff and for the volunteer but very senior advisors on the President's Council of Advisors on Science and Technology (PCAST), and using the connectivity of the staff and PCAST to draw on the advice and analysis of the best of the rest of the science and engineering communities. Making all of this work well is a task that, if confirmed, I would give great attention.

Besides efficiency in the use of the available human resources, a further key challenge for OSTP is carrying out its responsibility to ensure the science and technology advice the President and Congress receives, whether from inside or outside the government, is as objective and accurate as the state of the relevant fields permits, regardless of the political implications. If confirmed, I will consider this one of my highest obligations, which would extend to working with the federal agencies that generate and process scientific and technological information to be sure the best technical judgments of the scientists and engineers working there are never censored or distorted for ideological reasons.

I would like to briefly offer some thoughts about major challenges facing our country at the intersection between science and technology and the economy, the environment, and national security, and how the work of OSTP relates to addressing these challenges.

American investments in science and engineering have driven most of the innovations that underpin our economy today. A wide variety of studies conclude that between 50 and 85 percent of the growth of the U.S. economy over the past half-century -- and two-thirds of our productivity gains in recent decades -- are directly attributable to scientific and technological advances. In today's time of economic crisis, we must resist the temptation to reduce our investments in these foundations of our prosperity.

U.S. scientific leadership requires both creating an environment that encourages private investment in research and development while maintaining strong and balanced federal research programs that support the promising areas of R&D that are too far from obvious application, too uncertain in outcome, too costly, or too related to public as opposed to private goods to attract private funding.

In this connection, I want to give special mention to the importance of R&D in our space program. Maintaining and expanding our capabilities in space is sometimes regarded as a "luxury" we should do less of in the face of more pressing earthbound concerns. But that would be false economy. Space is crucial to our national defense; to civil as well as military communications and geo-positioning; to weather forecasting and storm monitoring; to observation and scientific study of the condition of our home planet's land, vegetation, oceans, and atmosphere; and to scientific study and exploration looking "outward" that is increasing our understanding of the physical universe and our place in it.

I also want to note the importance of the sustainability and predictability of the federal investment in science and engineering. The "boom and bust" cycles that have characterized much federal support in these domains over the past forty years are inefficient and disruptive of scientific progress.

In concert with helping to nurture the R&D enterprise in general, OSTP has an important function in promoting the translation of the results of R&D into new products and services that benefit Americans through widespread application. This country has long demonstrated a high capacity for turning novel ideas into new businesses and improved services in domains ranging from medical diagnostics, to instant access to information, to entertainment. Fostering this capacity for translating science and technology into widespread benefit will be crucial in

rebuilding our economy as well in addressing our most pressing challenges in energy, environment, health, and national security.

Development of new technologies and providing incentives for their widespread adoption will be particularly crucial at the demanding intersection of energy, national security, and climate change. Providing the affordable and reliable energy that our economic well-being requires while addressing the dangers of global climate change and over-dependence on oil from politically fragile regions are challenges demanding the utmost in collaboration among the relevant executive branch agencies, the Congress, and the private sector.

While climate change is the most demanding of all environmental challenges in terms of what will be required of science and technology in order to bring it under control, there are many other environmental problems we dare not neglect: air quality, water quality, toxic substances in our soil and foods, the condition of the forests on our territory and the oceans on our borders, and biodiversity, to mention some of the most important.

I know this Committee is well aware that bringing science and engineering to bear on solving these problems and thereby improving the environmental component of human well-being can also be a boost to the economy, not a drag, by virtue of the jobs and investment associated with these efforts.

Information technology has been a key driver of our productivity growth in recent decades and has fundamentally changed the way people worldwide communicate and work. But we have just seen the beginning of what can be achieved. Information technology has vast potential to improve health care, increase energy efficiency, monitor climate and other environmental conditions, and manage the immense amounts of data from scientific efforts from the Human Genome Project to the Large Hadron Collider.

Additionally, we can and should use existing information technologies – and the better ones yet to come -- to bring the U.S. government into the 21st century by streamlining internal operations, cutting costs, increasing information security, and making federal agencies more responsive to inputs from outside the government.

Better use of the existing and new information technologies will also be a key ingredient in the improvement of K-12, college, and university education in this country, not only to produce the future cohorts of scientists, engineers, and mathematicians we will need, but also to upgrade the country's entire workforce and provide Americans with the tools they need to participate successfully in our democracy in a milieu where science, technology, and information are becoming ever more important.

Last, but certainly not least, I want to mention the crucial roles that science and technology play in our country's capacity to deal with threats to our security both at home and abroad. These include the need to address complex new challenges -- asymmetric conflicts, urban operations, peacekeeping missions, cyber threats, and potential terrorist access to weapons of mass destruction – as well as all of the familiar but continuously changing challenges such as those associated with nuclear and biological weapons, ballistic-missile and missile-defense technology, and scientific intelligence gathering. The superb research done in the Defense

Advance Research Projects Agency and other parts of the defense research establishment has contributed to U.S. security for generations, and I regard it is a continuing obligation of OSTP to help see that this continues.

The “national security” and “international affairs” aspects of OSTP’s role in the security domain are, of course, tightly intertwined, not least because there are many security problems that either can only be solved or are most easily solved through multilateral agreements and cooperation rather than unilateral action. Nuclear nonproliferation is a prime example, but arms-control agreements and mechanisms more broadly continue to be an important element of our national-security portfolio. Science and technology are essential elements of improving our capacity to verify existing arms-control agreements, as well as to help decide what additional ones are in our national interest, and OSTP has a role to play in that.

Another aspect of OSTP’s responsibilities in the global arena relates to international research partnerships in science and in the technologies needed to address challenges that can only be surmounted by multilateral collaborations, such as climate change, oil-import vulnerabilities, and the condition of the world’s oceans. The cost and complexity of cutting-edge accelerators, telescopes, and certain experimental energy technologies (such as the ITER fusion experiment) are good reason in themselves for sharing the costs and risks internationally. I have been involved in international cooperation on fusion and other energy technologies since 1971, and if confirmed by the Senate I will be most eager to put the insights derived from that experience to good use in OSTP.

In conclusion, while our country clearly faces immense challenges in the economic, environmental, health, and security domains, among others, it is equally clear that science and technology can be key ingredients in turning those challenges into opportunities. It is likewise true that in science itself we are on the threshold of remarkable new discoveries about the universe, about how our own planet and its living systems work, and about how we learn, think, and remember. And we are on the verge of huge advances in computing and other information systems, in biotech, in nanotech, in greentech, and in the intersection of these domains.

But the pace of these advances is not automatic. How quickly or slowly we get them is in substantial part a matter of policy. The Office of Science and Technology Policy in the Executive Office of the President can play a crucial role, in cooperation with the other Executive Branch agencies and the Congress, in making it possible for us to reap these rewards sooner rather than later.

If the Senate confirms me for the position of Director of the Office of Science and Technology Policy, I would hope to work particularly closely with the members of this Committee, which has long been a source of steady, bipartisan support for the efforts needed to maintain America’s leadership across on the frontiers of science, engineering, and innovation.

I will be pleased to try to answer any questions you may have.