

**Statement of the Honorable Dr. John P. Holdren
Director, Office of Science and Technology Policy
Executive Office of the President of the United States
to the
Subcommittee on Oversight and Investigations
House Committee on Foreign Affairs
November 2, 2011**

Chairman Rohrabacher, Ranking Member Carnahan, and members of the Subcommittee, thank you for the opportunity to testify today on U.S.-China cooperation in science and technology (S&T). I hope that this testimony will be helpful in clarifying the Obama Administration's stance on the value such cooperation has had and can continue to have for our country, as well as on the measures that must be and are being undertaken to limit the potential downsides.

The Rationale for International Cooperation in Science and Technology in General

International cooperation in fundamental science has a long and rich tradition, rooted in the realities that outstanding scientific talent occurs in many countries and that the advance of science is accelerated, generally to the benefit of all involved, by exchange of data and analysis as well as by sharing of the best facilities and by direct engagement of the best minds with one another, wherever those facilities and minds may be. Of course, limits are sometimes placed on cooperation in fundamental science across the boundaries of countries that are adversaries or potential adversaries – or even competitors – when it is recognized that the first to achieve particular breakthroughs and subsequent practical applications of these may reap a large military or commercial advantage. That such circumstances sometimes apply, however, does not vitiate the value of cooperation to the advance of science where they don't apply.

As scientific and engineering activity moves from the realm of fundamental science toward applied science and the development of practical technologies, concerns about the balance of benefits versus liabilities of international cooperation naturally arise more often. Even so, there are many circumstances in which it may reasonably be judged that the benefits to the United States outweigh the liabilities, thus justifying cooperation. The main classes of potential benefits that may enter this calculus are as follows:

- gaining access to diverse R&D capacities, such as particular kinds of facilities and expertise, which are increasingly widely dispersed among countries;
- sharing the costs of research, development, and demonstration (RD&D) of kinds of innovation that would not bring much advantage to the country that achieved them first, or that entail larger RD&D costs than any one country is willing or able to bear;
- reducing costs of emerging technologies more rapidly through the accelerated learning that results from conducting demonstrations and pre-commercial deployments in larger and more varied markets and environments than those available domestically;

- enhancing U.S. firms' understanding of and access to large commercial markets for their products in other countries;
- accelerating the development and international deployment of technologies whose use elsewhere is likely to improve regional or global economic, environmental, or political conditions to the benefit of the United States (such as through reduced oil consumption, increased safety and proliferation resistance of nuclear-energy facilities, reduced climate-altering emissions, and politically stabilizing economic development in other countries); and
- providing a focus and venues for positive interactions with countries with which other aspects of our relations are strained, potentially providing opportunities and leverage to reduce the strains.

The potential liabilities of international S&T cooperation that is not well managed include: uncompensated transfer of intellectual property, inadvertent sharing of classified or otherwise sensitive information, and, ultimately, loss of economic or military competitive advantage.

For many years, in both Republican and Democratic administrations, this country's leadership has recognized that the benefits for the United States of appropriately focused and properly managed international S&T cooperation can outweigh the liabilities – even when the cooperation is with a potent adversary.

For example, the United States began formal government-to-government S&T cooperation with the Soviet Union in the Eisenhower Administration with the signing in 1958 of the “Agreement between the United States of America and the Union of Soviet Socialist Republics on Exchanges in the Cultural, Technical, and Educational Fields”. In that same year, the second Atoms for Peace conference in Geneva led to the initiation of U.S.-Soviet cooperation on harnessing thermonuclear energy for electricity production, which persisted until the disintegration of the Soviet Union in 1991 (and continues with Russia to this day).

Cooperation between these two countries in the 1960s encompassed mathematics, physics, earth sciences, and life sciences, among other disciplines. And in the early 1970s, in the Nixon Administration, Secretary of State Henry Kissinger successfully initiated a decade of expanded U.S.-Soviet scientific and technological cooperation as a centerpiece of U.S. efforts to improve relations between the two countries. U.S.-Soviet cooperation in space – which began with exchanges of weather-satellite data in the 1960s, under the Kennedy and Johnson presidencies – took on much more substantial form in 1975 with the Soyuz-Apollo docking demonstration.

With the increasing globalization of scientific and technological capabilities over the ensuing decades, the benefits of strategic international S&T cooperation have only become more pronounced. The need to manage these interactions carefully to avoid the loss of commercial and military advantage persists, of course, but it is even more clearly recognized now than before that avoiding the interactions altogether is not the way to achieve this.

For example, a study conducted by the National Research Council during the Bush Administration and published in early 2009 before President Obama was inaugurated – *Beyond Fortress America: National Security Controls on Science and Technology in a Globalized World* – concluded firmly that U.S. national security benefits from strategically focused international S&T collaboration, even when the nations involved are ones we do not fully trust. Indeed, that study found that disengaging from, or unduly restricting, such cooperation reduces our security. It contended that restrictions on international collaboration have slowed maintenance of U.S. military equipment and discouraged foreign contractors from purchasing U.S. equipment.

The report went on to say that, commercially, U.S. restrictions on the sharing of science and technology information internationally can actually help our foreign competitors more than it hurts them, by pushing them to invest research dollars in areas where the U.S. currently reigns—a process that can eventually lead to their gaining equality or superiority in fields where they were previously dependent upon U.S. expertise. Undue restrictions also have been documented as helping to drive knowledge-intensive jobs offshore from the United States.

President Obama has clearly articulated his own recognition of the value of appropriately focused and properly managed international S&T cooperation, as well as his commitment to continuing to derive for this country the benefits that such cooperation offers. Just a few months after his inauguration, for example, he told the 2009 annual meeting of the National Academy of Sciences that “[M]y administration is ramping up participation in – and our commitment to – international science and technology cooperation across the many areas where it is clearly in our interest to do so.” This recognition and commitment are reflected, as well, in the Administration’s *National Security Strategy*, released in May 2010, where the section on “Advancing Our Interests” contains the following statement:

America’s scientific leadership has always been widely admired around the world, and we must continue to expand cooperation and partnership in science and technology. We have launched a number of Science Envoys around the globe and are promoting stronger relationships between American scientists, universities, and researchers and their counterparts abroad. We will reestablish a commitment to science and technology in our foreign assistance efforts and develop a strategy for international science and national security.

And the Administration’s National Space Policy, released in June 2010, offers the following as one of the six overarching goals of our space programs:

***Expand international cooperation** on mutually beneficial space activities to: broaden and extend the benefits of space; further the peaceful use of space; and enhance collection and partnership in sharing of space-derived information. [emphasis in original]*

The Specific Case of S&T Cooperation with China

The relations of the United States with China are complex. The two countries behave as partners in some arenas, as competitors in some, and as potential adversaries in some. I am sure that most Americans – and certainly this includes me – are dismayed by the human-rights violations that have been repeatedly documented in China and that remain an affront to everyone

who cares about liberty and freedom. And certainly the Obama Administration is concerned about the theft of U.S. intellectual property that continues to be widespread in China, as well as about practices that discriminate against foreign firms in the Chinese marketplace under the banner of “indigenous innovation policy”; and we are aware of and concerned about the danger of loss of sensitive commercial and military technology in the course of cooperation with China. I commend you, Chairman Rohrabacher, along with Representative Wolf and others in Congress who have helped keep up the pressure on China to change its behavior in these areas, for these efforts.

That said, we in this Administration are not of the view that the solution to these challenges is to cut off our S&T cooperation with China. Quite the opposite, we believe U.S.-China S&T cooperation in forms that benefit both countries strengthens our hand in the effort to get China to change the aspects of its conduct that we oppose. Done properly, our cooperation can deepen the dialogue and facilitate progress in beneficial and sensitive areas alike. Besides this benefit, which corresponds to the last of the general benefits of international S&T cooperation that I listed earlier, all of the other benefits in that list also apply with particular force to the specific case of China. For example:

- it has rapidly growing capabilities in many domains of S&T – and rapidly growing resources being devoted to R&D – from which we can benefit through appropriately focused cooperation;
- its economy is the second largest in the world, after ours, and offers enormous potential markets to U.S. high-tech businesses whose access to and understanding of those markets are being facilitated in many cases by government-to-government S&T cooperation;
- as the world’s largest energy consumer and largest emitter of greenhouse gases, China is affecting energy prices everywhere and global climate-change everywhere; by cooperating with China on energy-efficiency technologies and climate-friendly energy supply, therefore, we are helping ourselves not just in shared R&D costs but in reduced Chinese impact on our economic and environmental interests.

The value of S&T cooperation with China was clear to leaders of both U.S. political parties long before the preceding factors had reached their current dimensions, however. That is why, in January 1979, the U.S.-China S&T Cooperation Agreement became the first formal agreement between the two countries on any topic, following the normalization of relations. And it is why that agreement has been renewed by every administration since, Republican and Democratic alike. Here are some of its provisions:

The principal objective of this Agreement is to provide broad opportunities for cooperation in scientific and technological fields of mutual interest, thereby promoting the progress of science and technology for the benefit of both countries and of mankind.

Cooperation under this Agreement may be undertaken in the fields of agriculture, energy, space, health, environment, earth sciences, engineering, and such other areas of science and technology and their management as may be mutually agreed, as well as educational and scholarly exchange.

Pursuant to the objectives of this Agreement, the Contracting Parties shall encourage and facilitate, as appropriate, the development of contacts and cooperation between government agencies, universities, organizations, institutions, and other entities of both countries, and the conclusion of accords between such bodies for the conduct of cooperative activities.

The agreement specifies that OSTP shall be its Executive Agent on the U.S. side and that “[t]he Executive Agent of each Contracting Party shall be responsible for coordinating the implementation of its side of such activities and programs.” It also specifies the establishment of a U.S.-China Joint Commission on Scientific and Technological Cooperation, which I, as Director of OSTP, co-chair with the Chinese Minister of Science and Technology.

This U.S.-China agreement has spawned many sub-agreements across domains as diverse as physics, public health, pest control, air-pollution control, and nuclear energy, and much that has benefitted the United States has been accomplished under their rubrics. A few recent examples:

- Joint research under an agreement between USDA’s Forest Service and the Chinese State Forestry Administration is focusing on controlling the spread of the Asian long-horned beetle, which arrived in the 1990s in wood packing material from China and which, along with other Chinese wood-boring insects, is poised to cause as much as \$138 billion in damage to U.S. hardwood forests.
- The U.S.-China Agreement created an environment under which health cooperation with China could expand and flourish. As a result of the Agreement, the U.S. Food and Drug Administration (FDA) was able to establish strong relationships and sign agreements with Chinese counterparts which, among other things: set standards for food and medical products entering the United States from China; increased information sharing; increased FDA access to production facilities; and encouraged China’s involvement with international standard-setting bodies. In Fiscal Year 2009, FDA opened offices in Beijing, Shanghai, and Guangzhou, staffed by policy and technical experts and inspectors, giving FDA the capacity to inspect more Chinese facilities, work with the exporting industry, and provide technical advice to its Chinese counterparts. FDA’s China Office represents an integral element of FDA’s efforts to strengthen the safety of Chinese goods exported to the United States.
- Cooperation under the 1998 Peaceful Uses of Nuclear Technologies agreement has improved safety and emergency-management capabilities within China’s nuclear sector and provided a more transparent view of China’s nuclear industry, and it now helps U.S. nuclear power plant companies compete for China’s rapid nuclear power plant development, which is a potential market of around \$100 billion. The U.S. nuclear industry also benefits from a reduced chance of a major accident in China that could undermine nuclear energy prospects world-wide, including in the United States.
- In the spirit of advancing clean coal, clean vehicles, and improving the energy efficiency of buildings, a joint \$150 million Clean Energy Research Center was established in November 2009 through collaboration among the Department of Energy (DOE) and

Ministry of Science and Technology and the National Energy Administration in China, with costs shared equally between the two countries. The objective of this Center is to leverage participation from research institutions, universities, and industry with potentially beneficial outcomes greater than had either country worked alone. U.S. government funds support domestic researchers and innovation, and particular attention has been paid to protection of intellectual property under the CERC, with IP agreements under the program endorsed by participating U.S. businesses.

Another focus of cooperation – this one situated within the U.S.-China Joint Commission on Scientific and Technological Cooperation at the request of the U.S. and Chinese leaders of the Strategic and Economic Dialogue (S&ED) between the two countries – is the U.S.-China Dialogue on Innovation Policy that I co-chair with Chinese Science and Technology Minister Wan Gang. These ongoing discussions, which include senior representatives of the departments/ministries/ offices of state, commerce, trade, finance, and S&T on both sides, have been centered around what actually works in innovation.

As a result of these discussions, China has pledged that its innovation policies going forward will be consistent with principles on non-discrimination, market competition, strong intellectual property protection and enforcement, and non-involvement of governments in the proprietary decisions of firms. And it has agreed to roll back specific, highly discriminatory measures related to government procurement that the Chinese government had been implementing under their heading of “indigenous innovation policy”. These achievements will help to ensure that U.S. exporters and U.S. firms that operate in China will not be shut out of China’s large government- procurement markets and that uncompensated loss to China of U.S. intellectual property will diminish.

The important Chinese concessions on innovation policy achieved through the U.S.-China Dialogue on Innovation Policy were confirmed by President Hu during the January 2011 summit in Washington, DC. The joint communique from that summit also noted the signing of the latest extension of the U.S.-China Agreement on Cooperation in Science and Technology and declared that “[t]he United States and China will continue to cooperate in such diverse areas as agriculture, health, energy, environment, fisheries, student exchanges, and technological innovation in order to advance mutual well-being.”

The Department of Defense and Full Year Continuing Appropriations Act of 2011

As the Subcommittee is aware, Section 1340(a) of the Department of Defense and Full Year Continuing Appropriations Act of 2011, Public Law Number 112-10, contains language intended to bar OSTP from engaging in bilateral interactions with China. I am a scientist and not a lawyer, so I will only try to explain here in the briefest terms why OSTP has not complied with that prohibition. For details on the legal reasoning, I refer you to the formal opinion issued September 19, 2011, by the Department of Justice (DOJ). I’d like to ask that it be added to the hearing record as an addendum to my written testimony.

The Department of Justice advised me – as I testified before Chairman Wolf on May 4, as the DOJ confirmed to him by letter on June 28, and as the formal opinion issued by DOJ on September 19 further elaborated – that OSTP’s activities in bilateral diplomacy with China on S&T issues fall under the President’s exclusive constitutional authority to conduct foreign

diplomacy and thus cannot be precluded by Section 1340(a). In reliance on this advice, OSTP continued to engage in these activities.

Conclusion

Members of the Subcommittee, the issue of U.S.-China cooperation in science and technology has not historically been one on which our two political parties took opposing positions, and I don't think it should be now.

Recall that President Ronald Reagan, when he renewed in 1984, with some fanfare, the U.S.-China Agreement on Cooperation in Science and Technology, said that the two nations should "expand our economic and scientific cooperation, strengthen the ties between our peoples, and take an important step toward peace and a better life... We're sharing the benefits of research in medicine, energy, and other technical fields." He added that "Our scientists are learning a great deal from each other in public health, agricultural sciences, and many other areas."

Similarly, this is not an issue that separates military leaders from civilians. Consider the comments of Admiral Mike Mullen, until recently the Chairman of the Joint Chiefs of Staff, who wrote as follows in an opinion piece in the New York Times in July: "I'm not naïve. I understand the concerns of those who feel that any cooperation benefits China more than the United States. I just don't agree. This relationship is too important to manage through blind suspicion and mistrust. We've tried that. It doesn't work."

I very much hope that this is an issue on which this Administration and this Congress can come to agree. I thank you for your attention.