The President's Office of Science and Technology Policy (OSTP): Issues for Congress

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Summary

Congress established the Office of Science and Technology Policy (OSTP) through the National Science and Technology Policy, Organization, and Priorities Act of 1976 (P.L. 94-282). The act states that "The primary function of the OSTP Director is to provide, within the Executive Office of the President [EOP], advice on the scientific, engineering, and technological aspects of issues that require attention at the highest level of Government." Further, "The Office shall serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government." The OSTP Director also manages the National Science and Technology Council (NSTC), established by Executive Order 12881, which coordinates science and technology (S&T) policy across the federal government, and co-chairs the President's Council of Advisors on Science and Technology (PCAST), a council of external advisors that provides advice to the President, established by Executive Order 13226. The OSTP Director also plays a role in the communication of scientific and technical information by federal agency scientists and engineers.

An issue for Congress is what should be the appropriate title, rank, role, and responsibilities of OSTP's Director, and the status and influence of PCAST and NSTC. Some in the S&T community contend that by providing the OSTP Director with cabinet rank, that individual would have more influence within the EOP. Others have proposed that the OSTP Director play a greater role in ensuring federal agency scientists and engineers are able to communicate their findings, and in federal agency coordination, priority-setting, and budget allocation. Another question is who should decide the issue focus of OSTP Associate Directors, NSTC interagency coordination activities, and PCAST. Further, some believe that NSTC has insufficient authority and PCAST insufficient influence on S&T policy.

On December 20, 2008, President Obama stated his intention to appoint Dr. John Holdren as Assistant to the President for Science and Technology (APST), OSTP Director, and Co-Chair of PCAST. At the same time, he said that "promoting science isn't just about providing resources—it's about protecting free and open inquiry." In his inauguration speech on January 20, 2009, President Obama stated, "We'll restore science to its rightful place." Since his inauguration, President Obama has issued executive orders, presidential directives, and executive memorandum regarding OSTP and APST position, including appointing the OSTP Director to the Domestic Policy Council, providing the OSTP director the ability to attend National Security Council meetings when science and technology related issues are on the agenda, and requiring the OSTP Director to develop recommendations for Presidential action designed to guarantee scientific integrity throughout the executive branch. President Obama has also stated that PCAST will be "a vigorous external advisory council that will shape my thinking on the scientific aspects of my policy priorities." He announced the new members of PCAST on April 27, 2009.

During his Senate nomination hearing, Dr. Holdren discussed plans to appoint four Associate Directors. One Associate Director would focus on each of the following: science, technology, environment, and national security and international affairs. He also discussed his goal of reviving and utilizing the NSTC, and the potential role of the new Chief Technology Officer. On the issue of federal scientists and engineers ability to communicate their findings to the public, Dr. Holdren discussed his goal of clarifying policies in response to the America COMPETES Act. This would include disseminating research results; developing appeal processes; and providing training to managers, researchers and public information staffs on those policies. Dr. Holdren's nomination as OSTP Director was confirmed by the Senate on March 19, 2009.

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Congress established the Office of Science and Technology Policy (OSTP), including the position of its Director, within the Executive Office of the President (EOP) through the National Science and Technology Policy, Organization, and Priorities Act of 1976 (P.L. 94-282).[1] The act states that "The Office shall serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government."

In addition, the act establishes the position of the OSTP director. According to the act, "The primary function of the OSTP Director is to provide, within the Executive Office of the President, advice on the scientific, engineering, and technological aspects of issues that require attention at the highest level of Government." Unlike the heads of some other EOP agencies, the OSTP Director testifies before congressional committees, even though the office provides advice and assistance to the White House.[2]

This report will provide an overview of the history of science and technology advice to the President, and provide an overview and discuss issues and options for Congress regarding OSTP's Director, OSTP management and operations, PCAST, and NSTC. The report also discusses actions taken by the Obama Administration regarding OSTP.

History of Science and Technology Advice to the President

Science and technology policy issues tend to reach the Presidential level if they involve multiple agencies; have budgetary, economic, national security, or foreign policy dimensions; or are highly visible to the public. In recent years, ethical issues, such as federal funding of stem cell research, have also reached this level of attention.

Throughout U.S. history, Presidents have obtained S&T advice through federal scientists and engineers, or informal personal contacts.[3] Since the early 1930s, Presidents have attempted to expand their sources of science and technology advice through a series of advisory boards and committees. These boards and committees tend to remain for discrete periods of time before being disbanded, often by the next President. When again faced with the need for S&T advice, new advisory boards or committees, sometimes reconstituted from previously disbanded ones, would be formed.

During the period between World War I and through World War II, the role of the application of research to provide technology for both military and economic purposes became evident. As a

[1] On November 12, 2008, CRS hosted a seminar entitled "The Role of the President's Office of Science and Technology Policy," with outside experts providing different perspectives on OSTP. A video of this seminar is available at http://www.crs.gov/products/multimedia/MM70117.shtml.

[2] For more information, CRS Report 98-606, *The Executive Office of the President: An Historical Overview*, by Harold C. Relyea; and CRS Report RL31351, *Presidential Advisers' Testimony Before Congressional Committees: An Overview*, by Harold C. Relyea and Todd B. Tatelman.

[3] For an overview of science and technology policy, see CRS Report RL34454, *Science and Technology Policymaking: A Primer*, by Deborah D. Stine. For a history of OSTP, see Genevieve J. Knezo, "Science and Technology," Chapter 6 in Harold C. Relyea (ed.), *The Executive Office of the President: A Historical, Biographical, and Bibliographical Guide* (Westport, Connecticut: Greenwood Press, 1997).

result, President Franklin D. Roosevelt established the Office of Scientific Research and Development (OSRD) in 1941. Following World War II, the utility of science and technology to society as exhibited during the War was crystallized in *Science, the Endless Frontier*, a 1945 report by Vannevar Bush, OSRD director. This report, which proposed a "program for postwar scientific research," set the stage for today's view of the relationship between the federal government and the S&T community regarding policy for science. In his report, Bush indicated that scientific progress was essential for the war against disease, for national security, and for the public welfare.

The next several Presidents used a variety of mechanisms to obtain S&T advice within the EOP, to enhance interagency coordination, and to receive counsel from outside advisors. Organizations within the EOP included the Office of the Special Assistant to the President for Science and Technology (Eisenhower), and Office of Science and Technology (OST; Kennedy, Johnson). Examples of organizations focused on interagency coordination included the President's Scientific Research Board (Truman), and the Federal Council for Science and Technology (Eisenhower, Kennedy, Johnson). Examples of external advisory committees are the Science Advisory Committee (Truman, Eisenhower), and the President's Science Advisory Committee (PSAC; Eisenhower, Kennedy, Johnson).

During the Nixon Administration, the S&T policy office in the White House, OST, was abolished, and relocated within NSF. In addition, President Nixon decided to not appoint new members to PSAC after its members resigned. President Ford supported the return of a science advisory mechanism to the White House, but he wished to establish it through legislation, not executive order.[4] He signed the National Science and Technology Policy, Organization, and Priorities Act of 1976 (P.L. 94-282) into law on May 11, 1976. This act established the position of OSTP and OSTP Director.

The **Appendix** provides a historical compilation of Presidential S&T policy advisers with their titles, EOP S&T agencies, interagency coordination organizations, and advisory committees.[5] As illustrated in the Table, the Presidents that followed President Ford continued to adapt OSTP and its related organizations to suit their needs. For example, the act included provisions for the OSTP Director to chair an Intergovernmental Science, Engineering, and Technology Advisory Panel (ISETAP). The ISETAP has since been subsumed by a cabinet-level council within the executive branch, NSTC, which is officially chaired by the President and managed by the OSTP Director. In addition, P.L. 94-282 also established a President's Committee on Science and Technology (PCST) with the OSTP Director as a member. The PCST was subsumed by PCAST with the OSTP Director as a co-chair.[6]

[4] Jeffrey K. Stine, *A History of Science Policy in the United States, 1940-1985*, Report for the House Committee on Science and Technology Task Force on Science Policy, 99th Cong., 2nd sess., Committee Print (Washington, DC: GPO, 1986), available at http://ia341018.us.archive.org/2/items/historyofscience00unit/historyofscience00unit.pdf.

[5] More S&T policy history is available CRS Report RL34454, *Science and Technology Policymaking: A Primer*, by Deborah D. Stine.

[6] PCAST was established by Executive Order 13226, "President's Council of Advisors on Science and Technology," 66 *Federal Register* 192, October 3, 2001, pp. 50523-52524 at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=fr03oc01-141.pdf.

Overview of OSTP

According to OSTP, it is to "serve as a source of scientific and technological analysis and judgment for the President with respect to major policies, plans, and programs of the Federal Government," and is authorized to:

- Advise the President and others within the Executive Office of the President on the impacts of science and technology on domestic and international affairs;[7]
- Lead an interagency effort to develop and implement sound science and technology policies and budgets;
- Work with the private sector to ensure Federal investments in science and technology contribute to economic prosperity, environmental quality, and national security;
- Build strong partnerships among federal, state, and local governments, other countries, and the scientific community; and
- Evaluate the scale, quality, and effectiveness of the Federal effort in science and technology.[8]

The following sections provide an overview of the responsibilities and roles of the OSTP Director, NSTC, and PCAST. Information is also provided on OSTP's budget and staffing.

Role of OSTP Director

The OSTP Director serves as a two-way communication conduit between the EOP and the federal and non-federal S&T community. Some OSTP Directors have focused on their role of communicating the views of the S&T community to the EOP. Others have focused on communicating the views of the EOP to the S&T community.

P.L. 94-282 authorizes the position of OSTP Director and places that individual at Level II on the executive pay scale. The OSTP Director is not a member of the Cabinet. The OSTP Director and up to four Associate Directors are appointed by the President and confirmed by the Senate.[9] The OSTP Director also holds the traditional title of Science Adviser to the President. Presidents have sometimes granted the science adviser the additional title of Assistant to the President for Science and Technology (APST) or Special Assistant to the President.

These titles may influence the degree of access the science adviser has to the President and EOP decision making. (See **Appendix** for a historical overview of science advisers and their titles.) Although each President differs in how he has managed EOP staff, generally a presumption of access to the President is accorded to Cabinet members and assistants to the President.[10] Those

[7] For more information on this topic, see CRS Report RL34503, *Science, Technology, and American Diplomacy: Background and Issues for Congress*, by Deborah D. Stine.

[8] OSTP, "About OSTP," Web page at http://www.ostp.gov/cs/about_ostp.

[9] The number of Associate Directors has varied. Throughout the Bush Administration, there were two Associate Directors: one focused on science and the other on technology.

[10] Information on the President's cabinet is available at http://www.whitehouse.gov/government/cabinet.html.

who hold other titles, such as the Director of an EOP office or a special assistant to the President, are presumed to have less access.

The OSTP Director also manages the National Science and Technology Council (NSTC), established by Executive Order 12881,[11] which coordinates science and technology (S&T) policy across the federal government, establishes national goals for federal S&T investments, and prepares coordinated research and development (R&D) strategies. In addition, the OSTP Director co-chairs the President's Council of Advisors on Science and Technology (PCAST), established by Executive Order 13226.[12] (See **Figure 1**.)

The role and influence of OSTP, NSTC, PCAST, and its predecessor organizations have varied among Administrations, depending both on the President and the individual serving as OSTP Director.[13]

Presidential Appointment Status and Congress

The relationship between Congress and the OSTP Director and APST varies depending on the nature of the appointment. If an individual serves only as APST, then no Senate confirmation is required. However, Congress does confirm the individual the President nominates to be OSTP Director. While the OSTP Director can be required to testify before Congress, APSTs may decline requests that they testify, indicating that, as an assistant to the President, they would not testify due to separation of powers and/or executive privilege.[14] Some Members of Congress may believe it is important to have oversight over whom is appointed as the president's science adviser, and to have an option of hearing testimony from the individual serving in that role. Others may believe that the role of OSTP Director or APST is sufficiently minor that they feel no need to have oversight over that position, and that they have other sources from which they may obtain S&T information.

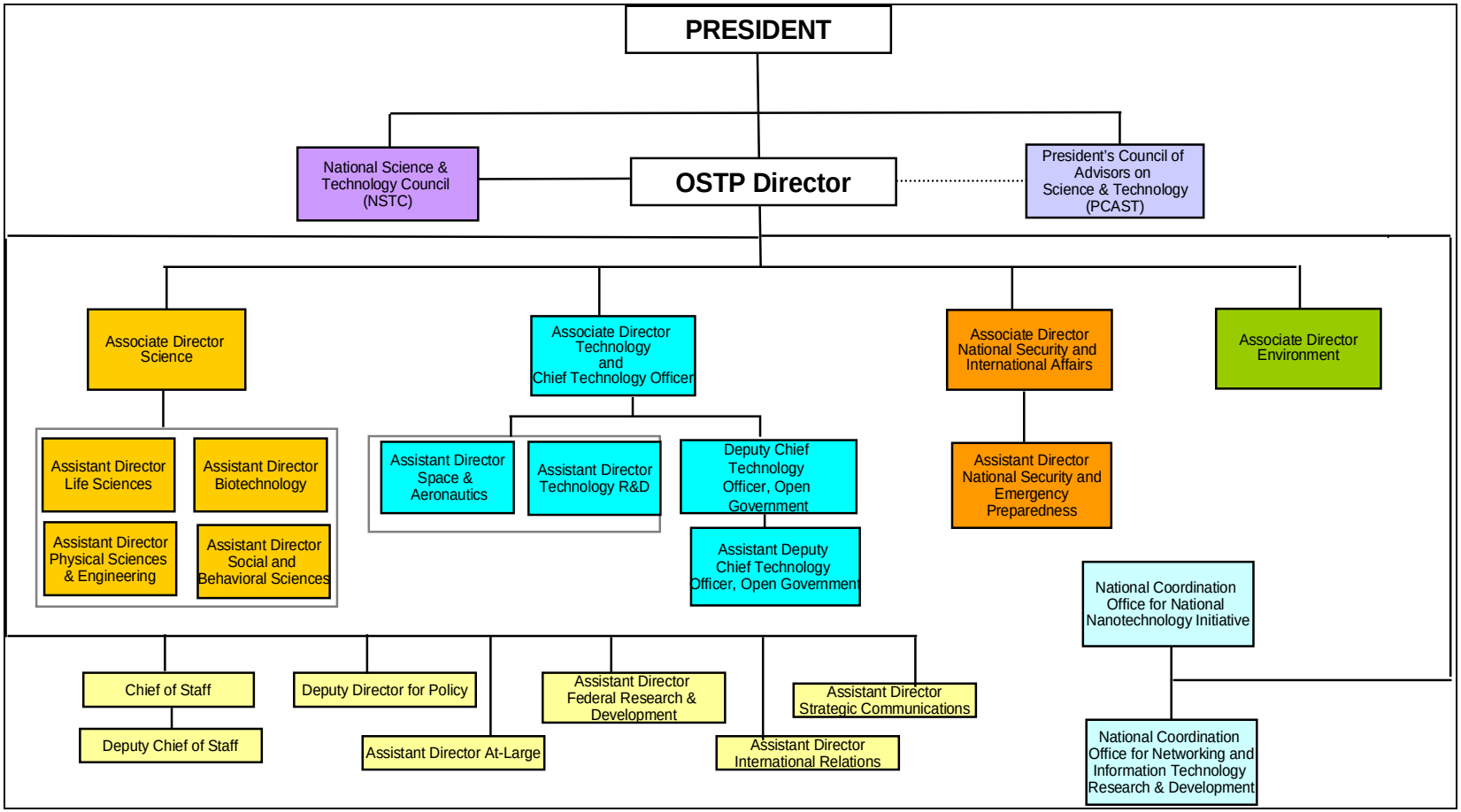
[11] Executive Order 12881, "Establishment of the National Science and Technology Council," 58 *Federal Register* 226, November 23, 1993, pp. 62491 at http://www.archives.gov/federal-register/executive-orders/pdf/12881.pdf. Note that the National Archives website at http://www.archives.gov/federal-register/executive-orders/disposition.html provides the disposition of all executive orders.

[12] Executive Order 13226, "President's Council of Advisors on Science and Technology," 66 *Federal Register* 192, October 3, 2001, pp. 50523-52524 at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=fr03oc01-141.pdf.

[13] For a discussion of the degree to which Science Advisers have been influential, listen to National Public Radio, *The Evolving Role of the Presidential Science Advisor*, Talk of the Nation, November 16, 2007, at http://www.npr.org/templates/story/story.php?storyId=16343713.

[14] For a fuller discussion of this issue, see CRS Report RL31351, *Presidential Advisers' Testimony Before Congressional Committees: An Overview*, by Harold C. Relyea and Todd B. Tatelman.

Figure 1. Office of Science and Technology Policy (OSTP) Organization



Source: Congressional Research Service based on information in OSTP, "Leadership and Staff," at http://www.ostp.gov/cs/about_ostp/leadership_staff. The organization chart has been reviewed and approved by OSTP via personal communication with CRS on May 28, 2009.

Notes: This chart is subject to change as appointments are made by the Obama Administration. The Associate Director of Technology and the Associate Director of Environment have been nominated and confirmed by the Senate. The other Associate Director positions have not been nominated, but the OSTP Director has indicated the intention of OSTP including Associate Directors with these titles during congressional testimony. Each Associate Director is in charge of a division with the same name with the exception of the Associate Director for Environment who is in charge of the Energy and Environment Division. For more information on the open government initiative, see http://www.whitehouse.gov/open/.

Roles and Responsibilities

Historically, the OSTP Director advises the President on policy formulation; presidential appointments; S&T-related budget issues, including research and development (R&D) and science, technology, engineering, and mathematics (STEM) education; and the policy significance of scientific and technical developments.[15] As OSTP Director and NSTC manager, this individual can provide federal agency coordination, information, and guidance when special events occur, such as national emergencies, disasters, or S&T-related international negotiations. As co-chair of PCAST, the OSTP Director can gather and identify the consensus of the S&T community on issues of interest to the Administration.

Under Executive Order 12472, the OSTP Director performs some special roles regarding National Security Emergency Preparedness communications.[16] First, the OSTP Director is designated to exercise most of the President's wartime communications powers under Section 706 of the Communications Act (47 U.S.C. 151 et seq.).[17] As a result, to perform these special Presidentially-delegated functions, a Presidentially-appointed Senate-confirmed appointee should be in charge of OSTP at all times.[18] Second, under Executive Order 12472, the OSTP Director also exercises several non-wartime emergency telecommunications functions, and leads the interagency Joint Telecommunications Resources Board (JTRB). The JTRB provides a forum for top-level discussions of emergency communications issues during times of crisis. In the wake of the September 11, 2001, terrorist attacks, Bush Administration OSTP Director John Marburger designated one civil service staff member to provide continuity on these issues across Presidential Administrations.[19]

Relationship with Other Agencies

The OSTP Director does not have direct authority over federal agencies or the Office of Management and Budget (OMB). Rather, the OSTP Director uses his or her role as a "bully pulpit" to encourage federal agencies, universities, nongovernmental organizations, and others in the S&T community to take or stop taking actions that the Administration supports or opposes. **Box 1** below provides an overview of the OSTP Director's role in the budget process and that individual's interaction with OMB.

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[15] Based on Carnegie Commission on Science, Technology, and Government, *Science & Technology and the President* (New York: Carnegie Corporation of New York, October 1988); National Academies, *Science and Technology Advice in the White House: Recommendations for President-Elect George Bush* (Washington, DC: National Academy Press, 1988); and National Academies, Committee on Science, Engineering, and Public Policy, *Science and Technology for America's Progress: Ensuring the Best Presidential Appointments in the New Administration* (Washington, DC: National Academy Press, 2008) at http://www.nap.edu/catalog.php?record_id=12481.

[16] Executive Order 12472, "Assignment of National Security and Emergency Preparedness Telecommunications Functions," April 3, 1984, at http://www.ncs.gov/library/policy_docs/eo_12472.html.

[17] Under the Communications Act, commercial telecommunications companies can be directed to perform specific functions on behalf of the government, such as providing priority services.

[18] There is an exception that occurs when an official is serving as the Acting Director through a Presidentially-approved succession order.

[19] Based on CRS discussions with Stanley Sokul, Chief of Staff, OSTP, November 6, 2008.

Box 1. OSTP Participation in the Federal Budget Process

In 2008 congressional testimony, Bush Administration OSTP Director John H. Marburger III described how OSTP participates in the federal budget process. The budget process involves four basic steps: (1) overall priority setting by OSTP and OMB, (2) agency preparation of budget proposal to OMB, (3) agency negotiations with OMB, and (4) final budget decision by the President and OMB Director.

A key activity in the first step is OSTP's request to federal agencies for their recommendations on R&D priorities. In addition, interagency working groups meet to determine which agencies will be responsible for certain activities where multiple agencies may be responsible for a given issue area. This information is used as the basis for an OSTP and OMB joint memorandum that described the Administration's R&D priorities and R&D investment criteria. Agencies are to use this memorandum as an aid in their preparation of the President's budget.

The Bush Administration also had fundamental principles that it followed in deciding whether or not to fund programs. For example, the Administration believed that the federal government should fund basic research, while applied research and development may be more appropriately funded by industry. These principles influenced what programs the Administration was willing to fund. (For a discussion of this issue, see CRS Report RL33528, *Industrial Competitiveness and Technological Advancement: Debate Over Government Policy*, by Wendy H. Schacht.)

During the second step, agencies prepare their budgets. The OSTP did not review agency budgets before they were sent to OMB but did continually interact with the agencies, providing advice and working with them on their priorities. During the Bush Administration, OSTP gave less attention to the National Institutes of Health and the Department of Energy, as it viewed this research as being totally within an agency's purview. OSTP Director Marburger stated that more guidance was given to other agencies that have larger science budgets and to programs that cross agency boundaries. Once completed, federal agencies then submit their proposed budgets to OMB.

In the third step, OMB worked with OSTP to review the proposed budgets to see if they reflected previously agreed upon plans and priorities. The OSTP also participated in OMB budget examiner presentations to the OMB Director and provided advice on priorities at that time.

OSTP Director Marburger stated that the strongest feedback on Administration priorities occurs during budget preparation (step 2); however, the most direct feedback occurred when agencies are negotiating with OMB (step 3). These negotiations included the funding levels and the programs on which that funding was spent.

In the fourth step, OSTP's primary role in the budget process was to advise on the quality of the proposals and their relevance to the priorities that had been established. The ultimate choices, however, were made by the President, the OMB Director, and the Cabinet, according to Dr. Marburger.

Source: Transcript of U.S. House of Representatives, Committee on Appropriations, Subcommittee on Commerce, Justice, Science and Related Agencies, "Office of Science and Technology Policy," hearing, February 26, 2008.

Note: The annual OSTP/OMB R&D priorities memorandum is available at http://www.ostp.gov/cs/rd_budgets.

National Science and Technology Council

On November 23, 1993, the National Science and Technology Council (NSTC) was established by Executive Order 12881 to coordinate science and technology policy across the federal government.[20] According to the executive order, NSTC is to coordinate the S&T policy-making process; ensure science and technology policy decisions and programs are consistent with the President's stated goals; help integrate the President's S&T policy agenda across the federal government; ensure S&T is considered in the development and implementation of federal policies and programs; and further international S&T cooperation.

[20] Executive Order 12881, "Establishment of the National Science and Technology Council," 58 *Federal Register* 226, November 23, 1993, pp. 62491 at http://www.archives.gov/federal-register/executive-orders/pdf/12881.pdf. The executive order also states that NSTC oversees the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), the National Space Council, and the National Critical Materials Council, none of which have been active since the NSTC was created.

In contrast to its predecessor, the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET), which was chaired by the OSTP Director, the NSTC is chaired by the President. Many of the NSTC members are cabinet officials. In practice, the NSTC has rarely had a meeting with the President or cabinet-level officials present. Rather, OSTP staff and detailees[21] manage NSTC activities in conjunction with federal agency staff.

NSTC had four primary committees: Science; Technology; Environment and Natural Resources; and Homeland and National Security. As shown in **Figure 2,** each NSTC committee had subcommittees, interagency working groups, or taskforces focused on specialized topics. The membership of these committees and subcommittees are generally not cabinet officials, but instead lower ranking staff.

Congress has mandated the existence of some subcommittees. For example, the America COMPETES Act (P.L. 110-69) directs the establishment of a President's Council on Innovation and Competitiveness. The act states that the council is to include the Secretary or head of a number of federal agencies, OSTP, and OMB. The chair of the council is to be the Secretary of Commerce. The council was established as an NSTC Committee on Technology subcommittee.[22]

President's Council of Advisors on Science and Technology

OSTP's external advisory committee is called the President's Council of Advisors on Science and Technology (PCAST) established through Executive Order 13226.[23] The PCAST was originally established by President George H. W. Bush, and was reestablished in the Clinton and George W. Bush Administrations. The executive order indicates that PCAST provides a mechanism for the President "to receive advice from the private sector and academic community on technology, scientific research priorities, and math and science education."[24] On occasion, PCAST also meets with the President to discuss science and technology policy issues. Several presidential level advisory committees established in previous Administrations have been subsumed under PCAST.[25] PCAST's members are high-level executives from industry, education and research institutions, and other nongovernmental organizations.

[21] A detail is an officially approved temporary assignment of a civil service employee (called informally a "detailee") to a different position in another federal agency. The employee's official title, series, grade, rate of compensation, or permanent employer does not change.

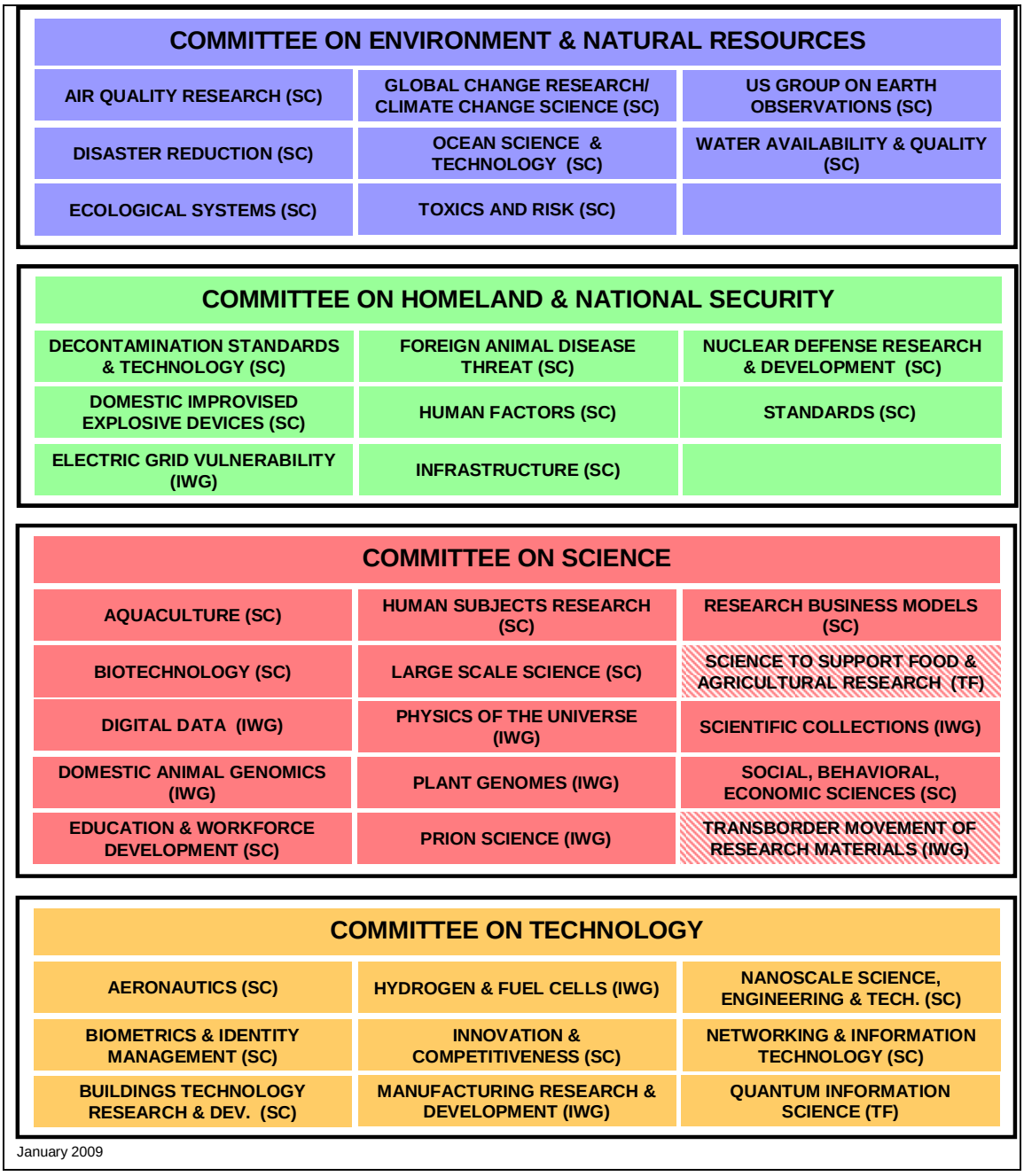
[22] White House, "Memorandum for the Director of the Office of Science and Technology Policy," April 10, 2008, at http://www.whitehouse.gov/news/releases/2008/04/20080410-5.html.

[23] Executive Order 13226, "President's Council of Advisors on Science and Technology," 66 *Federal Register* 192, October 3, 2001, pp. 50523-52524 at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=fr03oc01-141.pdf.

[24] For more information on PCAST, see http://www.ostp.gov/cs/pcast/about.

[25] For example, Executive Order 13385 assigned the role and responsibilities of the President's Information Technology Advisory Committee (PITAC) to PCAST. Executive Order 13385, "Continuance of Certain Federal Advisory Committees and Amendments to and Revocation of Other Executive Orders," 70 *Federal Register* 57989-57991, October 4, 2005 at http://edocket.access.gpo.gov/2005/pdf/05-19993.pdf.

Figure 2. National Science and Technology Council Committees



Source: National Science and Technology Council, website, accessed June 2, 2009, at http://www.ostp.gov/cs/nstc/committees.
Note: SC = subcommittee; IWG = interagency working group; TF = task force.

OSTP Budget and Staffing

The degree to which OSTP can provide advice to the President and respond to congressional action is related to its budget and staffing. **Figure 3** provides OSTP's budget and **Figure 4** provides OSTP's staffing level from FY1977 until FY2008. The OSTP's FY2009 budget is $5.3 million.[26] The Bush Administration through the National Science Foundation's (NSF) budget requested an additional $3.0 million for FY2009 to support OSTP's Federally Funded Research and Development Center (FFRDC),[27] the Science and Technology Policy Institute (STPI).[28]

As illustrated in **Figure 3** and **Figure 4**, OSTP funding and staffing levels have varied among Presidential Administrations. After its initial startup in the Ford Administration, OSTP funding peaked during the G.H.W. Bush Administration, and was at its lowest during the Reagan Administration. The OSTP's staffing was at its peak during the Clinton Administration and at its lowest in the Reagan Administration. Some are concerned that this uneven funding and staffing situation leads to inconsistent provision of S&T advice within the EOP.

Although the White House has allocated OSTP 40 full-time equivalent staff members, it does not fund staffing at that level. As of Fall 2008, OSTP had a total of 65 staff members, detailees, and fellows.[29] According to OSTP, this total includes 12 political staff, 19 non-political staff, and 34 detailees and fellows.[30] The political and non-political staff are funded by OSTP, the detailees are funded by their agencies, and the fellows by a variety of organizations.

[26] In the explanatory language for P.L. 111-8, Congress required that "Not later than 120 days after the enactment of this Act, the reports identified below shall be submitted to the House and Senate Committees on Appropriations. Within the funds provided, OSTP shall: (1) working with NASA and the Department of Energy, develop a plan for restarting and sustaining U.S. domestic production of radioisotope thermoelectric generator material for NASA's future science and exploration missions; (2) working with NASA and NOAA, develop a plan and program to encourage commercial solutions to meet space-based Earth and space weather observation requirements of the United States government, similar to the Federal investments in NASA's commercial orbital transportation services (COTS) program. Such report shall consider the efficacy of providing appropriated funds to commercial entities to pursue low-cost atmospheric, environmental or space weather monitoring systems, and whether such funding should be offered to commercial entities in exchange for later concessionary rates on weather, climate or space weather data purchasers from successful vendors; and (3) convene a series of meetings to coordinate the research and development of the next generation of ground-based radar and to report the results of the meetings and a budget plan."

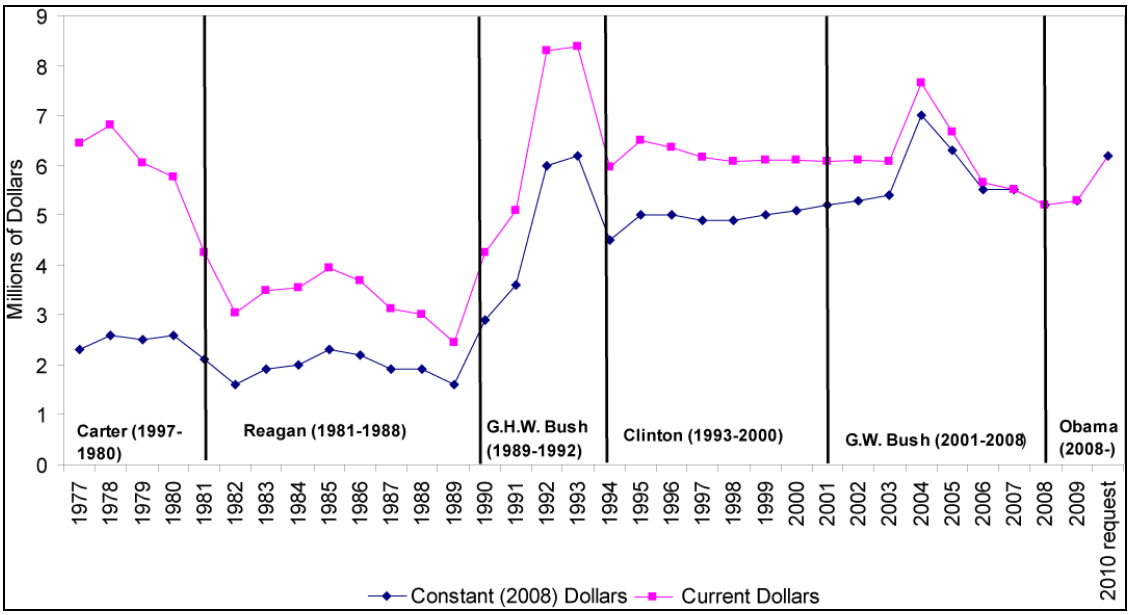
[27] For more on FFRDCs, see CRS Report RL34454, *Science and Technology Policymaking: A Primer*, by Deborah D. Stine.

[28] In 1991, as part of P.L. 105-207, Congress established STPI. The FY2008 explanatory statement directed that funding appropriated to the NSF for costs related to STPI be transferred to OSTP. These funds were not reflected in the OSTP's FY2009 budget request. Instead, funding for STPI continued to be requested through the NSF. More information on STPI is available at http://www.rand.org/scitech/stpi/about.html and http://www.ida.org/stpi/pages/about.html.

[29] Based on CRS discussions with Stanley Sokul, Chief of Staff, OSTP, August 20, 2008.

[30] Fellows are scientists and engineers who come to Washington to gain experience in public policy. Most are recent graduates of doctoral programs, but some are more experienced staff from industry or universities. Fellows generally come for a year, but that time can be extended.

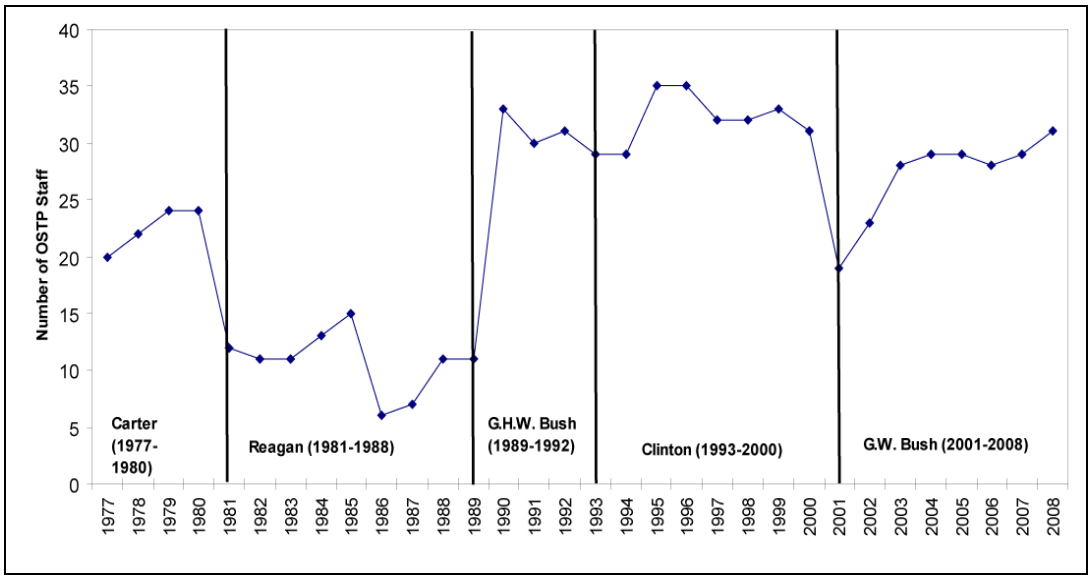
Figure 3. OSTP Funding, FY1977-FY2009



Source: Congressional Research Service. Data is from Appropriation Acts and Committee Reports, FY1977-FY2009.

Note: Due to lack of comparability, data from FY1976 and the Transition Quarter (TQ) that took place from July 1, 1976 through September 30, 1976 is not included. Funding for OSTP's FFRDC, STPI, is also not included.

Figure 4. OSTP Staffing Level, FY1977-2008

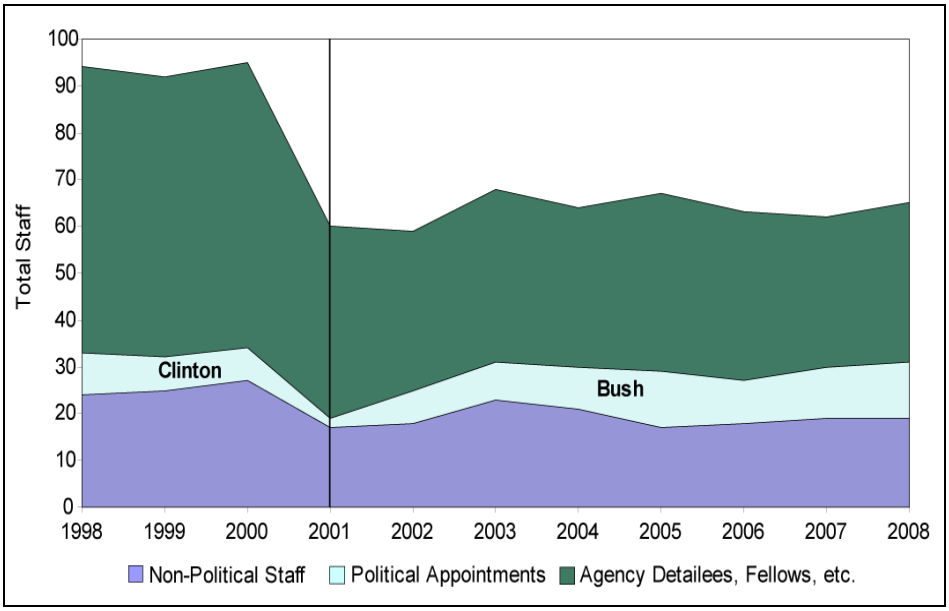


Source: Congressional Research Service. Data is from U.S. Office of Management and Budget, *Budget of the United States Government*, Appendix, FY1979-FY2009. (Note that actual staffing numbers are provided two years later. For example, to determine actual staffing in FY2007, one must review the FY2009 budget request.). The OMB did not provide this data for FY2001, and information is not yet available for FY2008. For these two fiscal years, CRS provides an estimate based on information provided by OSTP. (E-mail communication between CRS and OSTP on August 18, 2008).

Note: The number of OSTP staff includes only political and non-political staff. It does not include detailees or fellows. For this information, see **Figure 5**.

As illustrated in **Figure 5**, both the Clinton and the G.W. Bush Administrations relied on detailees and fellows to conduct OSTP's activities. The detailees and fellows are not included in OSTP's budget request to Congress each year, so information regarding their number is irregular in its availability. The available data, however, illustrate that OSTP has increasingly relied on detailees and fellows. For example, in FY1992, the number of detailees and fellows was 11.[31] Toward the end of the Clinton Administration (FY2000), there were 61 detailees and fellows; since 2001, approximately 30-40 detailees per year have provided about one-half of OSTP's staffing needs.

Figure 5. OSTP Political and Non-Political Staff, Detailees, and Fellows, FY1998-FY2008



Source: Congressional Research Service based on data provided by OSTP (e-mail communication between CRS and OSTP on August 18, 2008).

Issues for Congress

Congress faces several issues regarding oversight and implementation of OSTP. These include the title, rank, roles, and responsibilities of the OSTP Director; the number and issue focus of OSTP Associate Directors; and the sufficiency of OSTP budget and staffing. A related issue is the participation of OSTP and NSTC in federal agency coordination, priority-setting, and budget allocation. Other issues are what role OSTP should play in the communication of scientific and technical information by federal agency scientists and engineers, and the appropriate stature and influence of PCAST. Each of these issues will be discussed in more depth below along with the actions taken regarding each by the Obama Administration.

[31] U.S. Congress, House Committee on Appropriations, Subcommittee on Departments of Veterans Affairs and Housing and Urban Development, and Independent Agency Appropriations for 1995, *National Science Foundation and Office of Science and Technology Policy*, hearing, 103rd Cong., 2nd sess., 1994.

Title, Rank, Roles, and Responsibilities of OSTP Director

Some in the science and technology community have proposed that the OSTP Director have the title of APST or hold cabinet rank.[32] A related issue is whether or not the roles and responsibilities of the OSTP Director should be undertaken by several appointees rather than one.

Title and Rank

As shown in the **Appendix**, presidential science advisers have held a variety of titles since the F.D. Roosevelt Administration. Of the 12 Administrations reviewed, the most common title has been some variation of Science Adviser to the President (five Administrations), followed by Special Assistant to the President (four Administrations). The OSTP Director held the title of APST in the George H.W. Bush and Clinton Administrations but not in the George W. Bush Administration. President Obama has decided to provide John Holdren, his Administration's OSTP Director, with the APST title as well as Co-Chair, PCAST.

Congress may be interested in two policy issues related to additional EOP titles held by the OSTP Director. First, as discussed earlier, while the OSTP Director can be required to testify before Congress, APSTs may decline requests that they testify, indicating that, as an assistant to the President, they would not testify due to separation of powers and/or executive privilege. Congress asks the OSTP Director to testify on science and technology policy related issues on a regular basis. For example, the Bush Administration OSTP Director testified on a wide variety of topics, including climate change research including concerns about political interference with this research; information technology R&D program oversight; windstorm impact reduction; women in academic science and engineering; coal gasification; international science and technology cooperation; patents developed with federal research dollars; weather satellites; competitiveness and basic research; and the R&D budget. Congress may wish to ensure the availability of the OSTP Director to testify on issues of congressional interest.

Some in the science and technology community contend that if the OSTP Director had cabinet rank, that individual would have more access to the President and other senior Administration staff.[33] They believe that cabinet rank status would enhance the director's authority and influence the degree to which a scientific and technical viewpoint is incorporated into Administration

[32] See for example, Carnegie Commission on Science, Technology, and Government, *Science & Technology and the President* (New York: Carnegie Corporation of New York, October 1988) at http://www.carnegie.org/sub/pubs/science_tech/nextadm.htm; Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf; Ensuring the Best Presidential Appointments in the New Administration, Committee on Science, Engineering, and Public Policy, *Science and Technology for America's Progress: Ensuring the Best Presidential Appointments in the New Administration* (Washington, DC: National Academy Press, 2008) at http://www.nap.edu/catalog.php?record_id=12481; Jennifer Sue Bond, Mark Schaefer, David Rejeski, Rodney W. Nichols, *OSTP 2.0: Critical Upgrade: Enhancing Capacity for White House Science and Technology Policymaking: Recommendations for the Next President* (Washington, DC: Woodrow Wilson International Center for Scholars, June 2008) at http://wilsoncenter.org/news/docs/OSTP%20Paper1.pdf; and Center for the Study of the Presidency, Study Group on Presidential Science and Technology Personnel Advisory Assets, "Presidential Leadership to Ensure Science and Technology in Service of National Needs: A Report to the 2008 Candidates" at http://www.thepresidency.org/pubs/science_tech_2008.pdf.

[33] National Academies, Committee on Science, Engineering, and Public Policy, *Science and Technology for America's Progress: Ensuring the Best Presidential Appointments in a New Administration* (Washington, DC: National Academy Press, 2008) at http://www.nap.edu/catalog.php?record_id=12481.

decision-making. Others question whether or not the OSTP Director would have had more influence with the APST title, and view it as a trivial issue that would be unlikely to result in a substantive impact on the ability of the OSTP Director to participate in EOP activities including Cabinet meetings.[34] They also express concern that confusion might arise if Congress could require some Administration staff with "Assistant to the President" titles to testify, but not others.

In response, some in the S&T community contend that the individual serving as APST should be able to discriminate between privileged advice to the President that should not be disclosed to Congress and information appropriate for Congress to know.[35] They also state their belief that in order to be influential, the APST or OSTP Director should be a cabinet-level position and identified at the same time as cabinet members, shortly after the election of a new Administration. As APST, the individual could begin work immediately; however, undertaking the duties of OSTP Director would require formal nomination and Senate confirmation.[36] If identified early, some in the S&T community contend, the APST could provide the President with advice during important early stages of the Administration. In addition, the APST could identify and recruit the best scientists, engineers, and health professionals for the approximately 100 S&T policy-related presidential appointments.[37]

From a historical perspective, some experts believe that the relationship between the President and the science adviser is so unique and idiosyncratic that no assumptions can be made regarding the influence of that individual on presidential decision-making.[38] Another perspective is that the S&T adviser's status and access is based on how the White House is organized.[39] According to this perspective, if the President relies for advice primarily on a group of White House staff members, the adviser should be the APST. If the cabinet is the primary adviser, than the adviser should be made a member of the Cabinet without portfolio. Based on this perspective, the title itself is less important than the access to the President that it signals. Other critics contend that rather than focusing on the title, the S&T community should instead focus on the degree to which the Presidential Administration will be transparent about its operations.[40]

On December 20, 2008, President Obama stated his intention to appoint Dr. John Holdren as APST, OSTP Director, and Co-Chair of PCAST.[41] On February 12, 2009, the Senate Committee

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[34] Based on CRS discussions with Stanley Sokul, Bush Administration Chief of Staff, OSTP, August 14, 2008.

[35] See, for example, Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf.

[36] National Academies, Committee on Science, Engineering, and Public Policy, *Science and Technology for America's Progress: Ensuring the Best Presidential Appointments in a New Administration* (Washington, DC: National Academy Press, 2008) at http://www.nap.edu/catalog.php?record_id=12481.

[37] For a list of the 50 to 60 S&T policy appointments deemed most urgent by the National Academies, see National Academies, Committee on Science, Engineering, and Public Policy, *Science and Technology for America's Progress: Ensuring the Best Presidential Appointments in a New Administration* (Washington, DC: National Academy Press, 2008) at http://www.nap.edu/catalog.php?record_id=12481.

[38] Roger Pielke, Jr., "Who has the ear of the President?," *Nature* 450:347-348, November 15, 2007 at http://www.nature.com/nature/journal/v450/n7168/full/450347a.html.

[39] National Academies, *Science and Technology Advice in the White House: Recommendations for President-Elect George Bush* (Washington, DC: National Academy Press, 1988)

[40] For a discussion of this issue, see David Goldston, "US election: Not the best advice." *Nature*, 455:453, September 24, 2008, at http://www.nature.com/news/2008/080924/full/455453a.html.

[41] President Obama appointed Dr. Harold Varmus and Dr. Eric Lander as the other co-chairs of PCAST.

on Commerce, Science, and Transportation Committee held a hearing on the Nomination of Dr. John Holdren to be OSTP Director.[42] Dr. Holdren's nomination as OSTP Director was confirmed on March 19, 2009.

Roles and Responsibilities

The OSTP Director has a number of roles and responsibilities. As stated by Dr. Holdren:

> 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.[43]

First as noted above, the OSTP Director is to cover two broad policy areas—science and technology—and also the issue areas where science and technology might influence decision making on key policies such as national security, environment, and energy policy. Today, this can include almost every public policy issue. Second, the OSTP Director is to provide advice to the President and key Administration officials including working with OMB on the R&D budget. Third, the OSTP Director is to manage the NSTC and co-chair PCAST. Fourth, the OSTP Director coordinates communication activities during disasters, and represents the United States at international S&T policy-related meetings.

One option might be to separate these roles into multiple positions, and have several appointees undertake them. For example, one appointee could cover science and another technology. One might focus on providing advice to the President and PCAST and another on coordinating NSTC interagency activities and S&T advice for agencies who lack the needed expertise.

The S&T community has debated, for example, the option of having two different individuals serve as APST and OSTP Director. While some believe having two people serve in these roles might enhance the ability and potential of an APST to be part of the President's inner circle,

[42] A webcast of the hearing is available from the Senate Commerce Committee at http://commerce.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=9ba25fea-5f68-4211-a181-79ff35a3c6c6.

[43] Testimony of Dr. John P. Holdren, Director-designate, Office of Science and Technology Policy, Executive Office of the President, "Nominations Hearing," Senate Committee on Commerce, Science, and Transportation, hearing, 111th Congress, 1st sess., February 12, 2009 at http://commerce.senate.gov/public/_files/JohnHoldrenSenatetestimony_21009.pdf.

others believe the potential for conflict between the two is high.[44] Some of these same arguments have been made regarding the option of having one appointee focus on science, and another on technology. In this case, the concerns expressed by some in the technology community are about the potential conflict that might occur between a presidential appointee focused on technology,[45] and the OSTP Director.[46]

Another challenge in implementing this option is that OSTP's budget and staff are limited.[47] Two senior officials with their associated staff may be more than can be supported given these limitations. Possible Congressional options are to request the President to appoint an APST, potentially early in the Administration, designate the OSTP Director as having cabinet rank status, or enhance the OSTP Director's EOP designation within the EOP so that they have more political stature and authority.

Number and Issue Focus of OSTP Associate Directors

OSTP Associate Directors are Senate-confirmed presidential appointees who focus on specific areas of science and technology policy. According to the act that established OSTP (P.L. 94-282), OSTP can have no more than four Associate Directors. During the Clinton Administration, four Associate Directors focused on the following issues: science; technology; environment; and national security and international affairs. The Bush Administration reduced the number of OSTP Associate Directors to two—one focused on science and the other on technology—and added the title of Deputy Director for each.[48] As a historical illustration, the Carter Administration had three Associate Directors focused on the issue areas of National Security, International and Space Affairs; Human Resources and Social and Economic Services; and Natural Resources and Commercial Services.[49]

Some Members of Congress have expressed an interest in specifying the issue focus of OSTP Associate Directors or the Assistant Directors who report to them. For example, in its report (S.Rept. 110-124) on the Departments of Commerce and Justice, Science, and Related Agencies Appropriations Bill, 2008, the Senate Committee on Appropriations recommended OSTP create an Associate Director for Earth Science and Application position to coordinate all federal efforts to better understand and predict changes in the earth's climate and oceans.[50]

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[44] National Academies, Committee on Science, Engineering, and Public Policy, *Science and Technology in the National Interest: Ensuring the Best Presidential and Federal Advisory Committee Science and Technology Appointments* (Washington, DC: National Academy Press, 2005) at http://www.nap.edu/catalog.php?record_id=11152.

[45] For more information on the possible chief technology officer position, see CRS Report R40150, *A Federal Chief Technology Officer in the Obama Administration: Options and Issues for Consideration*, by John F. Sargent Jr.

[46] David Hatch, "Tech Czar Might Rule Policy under Obama," *Congressional Daily*, September 10, 2008, at http://www.nationaljournal.com/congressdaily/cda_20080910_6421.php?related=true&story1=cda_20080910_6421&story2=cd_20080912_9947&story3=null.

[47] For more information, see section on"OSTP Budget and Staffing."

[48] Based on CRS discussions with Stanley Sokul, Chief of Staff, Bush Administration OSTP, August 14, 2008.

[49] General Accounting Office, *The Office of Science and Technology Policy: Adaptation to a President's Operating Style May Conflict with Congressionally Mandated Assignments*, PAD-80-79, September 3, 1980, at http://archive.gao.gov/f0102/113202.pdf.

[50] CRS Report RL34092, *Commerce, Justice, Science, and Related Agencies: FY2008 Appropriations*, coordinated by William J. Krouse.

Some in the science and technology community also propose that some of the OSTP Associate Director positions could be shared appointments with the National Economic Council (NEC), National Security Council (NSC), Homeland Security Council (HSC), Domestic Policy Council (DPC), and Office of Management and Budget (OMB).

Dr. Holdren has testified that OSTP will have four Associate Directors. The focus of these Associate Directors will be the same as that in the Clinton Administration: science; technology; environment; and national security and international affairs. In interviews conducted since his confirmation as OSTP Director, Dr. Holdren has stated that the Associate Director for Science will oversee STEM Education activities, and the Associate Director for National Security and International Affairs will hold a joint appointment on the National Security Council.[51]

Subsequently, on March 4, 2009, President Obama nominated Sherburne "Shere" Abbott, for Associate Director of Environment.[52] On April 18, 2009, President Obama stated that Aneesh Chopra, Virginia's Secretary of Technology, will serve as both Associate Director for Technology and Chief Technology Officer. Both have been confirmed by the Senate. The other two Associate Directors have not yet been nominated.

Sufficiency of OSTP Budget and Staffing

The ability of OSTP to undertake the actions requested of it depends on both its budget and staff. **Figure 3** and **Figure 4**, presented earlier, provide OSTP's historical budget and staffing. Some reports developed by the S&T community express their concern that OSTP needs to have more civil service professional staff and a higher budget.[53] Such staff, they say, would maintain institutional knowledge and have a solid understanding of the government operations. As a result, these staff members could enhance support to political appointees. These reports assert that this change would make OSTP staff similar to other EOP expert staff, such as those employed at OMB.[54] Additional funding, these reports state, would provide OSTP with sufficient staff and the ability to conduct special analyses on emerging issues.

Congress may wish to maintain the current situation, or it might wish to increase the number of OSTP civil service staff; specify the number of Associate Directors; designate the policy issue focus of the Associate Directors; or require that OSTP through its Director or Associate Directors play a greater role in the activities of other EOP agencies, such as the OMB, NEC, CEQ, DPC, HSC, and NSC.

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[51] Jeffrey Mervis, "John Holdren Brings More than Energy to His Role as Science Adviser," *Science*, vol. 324 (April 17, 2009), pp. 324-325.

[52] For more information, see http://www.whitehouse.gov/the_press_office/President-Obama-Announces-More-Key-Administration-Posts/.

[53] Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf; and Jennifer Sue Bond, Mark Schaefer, David Rejeski, Rodney W. Nichols, *OSTP 2.0: Critical Upgrade: Enhancing Capacity for White House Science and Technology Policymaking: Recommendations for the Next President* (Washington, DC: Woodrow Wilson International Center for Scholars, June 2008) at http://wilsoncenter.org/news/docs/OSTP%20Paper1.pdf.

[54] According to the FY2009 budget request, OMB's budget is $78 million, which supports 489 staff members. For more information, see http://www.whitehouse.gov/omb/budget/fy2009/pdf/appendix/eop.pdf.

Should Congress wish to enhance the funding and staffing of OSTP, it can do so through the appropriations process. Congress provided $5.3 million for OSTP in FY2009. One alternative to examine if Congress wishes to increase the number of OSTP civil service staff while maintaining OSTP's current budget is the use of OSTP's FFRDC, the Science and Technology Policy Institute. In FY2009, Congress appropriated $3.0 million for STPI—almost half the funding for the remainder of OSTP's activities.[55] Therefore, OSTP's FY2009 budget would be over $8.3 million if the two funds were combined. On the other hand, OSTP may need the short-term analysis of scientific and technical information STPI provides.

The Obama Administration has requested $6.2 million for OSTP for FY2010, $0.9 million more than its FY2009 funding.[56] In addition, President Obama issued an executive order appointing the OSTP Director and the CTO to the DPC.[57] By providing Dr. Holdren with the APST title, he is already a member of the NEC. In a separate executive order, he also named the CTO to the NEC.[58] Further, Presidential Policy Directive 1 (PDD-1) states that "When science and technology related issues are on the agenda, the NSC's regular attendees will include the Director of the Office of Science and Technology Policy." PDD-1 also states that Presidential Policy Directives and Presidential Study Directives will replace National Security Presidential Directives.[59]

OSTP and NSTC Participation in Federal Agency Coordination, Priority-Setting, and Budget Allocation

As discussed earlier, OSTP, the OSTP Director and Associate Directors, and the NSTC are involved in coordination, priority-setting, and budget allocation for federal S&T activities. S&T policy organizations have suggested that this involvement be enhanced. This section describes those perspectives.

Role of OSTP Director

Some reports from the science and technology community state that they would like the OSTP Director to take a greater role in coordination, priority-setting, and budget allocation regarding the R&D budget,[60] energy;[61] STEM education;[62] international science and technology policy;[63]

[55] For FY2008, funding for STPI was not requested as part of OSTP's budget request, but that of the National Science Foundation (NSF). Congress directed that NSF transfer STPI funding to OSTP.

[56] Ibid.

[57] White House, *Further Amendments To Executive Order 12859,Establishment Of The Domestic Policy Council*, February 5, 2009. For more information, see http://www.whitehouse.gov/the_press_office/Executive-OrderFurther-Amendments-To-Executive-Order-12859Establishment-Of-The-Domestic-Policy-Council/.

[58] White House, *Further Amendments to Executive Order 12835, Establishment of the National Economic Counci*l, February 5, 2009. For more information, see http://www.whitehouse.gov/the_press_office/Executive-Order-Further-Amendments-to-Executive-Order-12835-Establishment-of-the-National-Economic-Council/.

[59]White House, *Organization of the National Security Council System*, Presidential Policy Directive -1 (PDD-1), February 13, 2009**.** For more information, see http://fas.org/irp/offdocs/ppd/ppd-1.pdf.

[60] Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf.

[61] Senator Jeff Bingaman, "The Energy Challenge We Face and The Strategies We Need," The Karl Taylor Compton Lecture, Massachusetts Institute of Technology, April 25, 2008 at http://energy.senate.gov/public/_files/
(continued...)

and federal-state science and technology policy.[64] In addition, some in the S&T policy community have suggested that the OSTP Director play a greater role in EOP policy bodies that are involved in priority-setting and budget allocation such as OMB, NEC, CEQ, DPC, and the NSC.[65] For example, the OSTP Director could be required to play a greater role (e.g., certification) in setting priorities at the federal agencies, particularly for multi-agency and inter-agency activities.

Role of NSTC

Another recommendation in these science and technology community reports is that NSTC's authority should be equivalent to that of the NSC.[66] The NSTC, they believe, lacks the influence of NSC because it does not have the same statutory authority, staff, or budget.

For example, during the Clinton Administration, six NSTC Presidential Review Directives (PRD)[67] were issued. The PRDs served as the basis for gathering information, and policy options for the President. President Clinton then had this information available as he developed eight Presidential Decision Directives (PDD) establishing new policy.[68] The Bush Administration took a different approach instead issuing executive orders or executive memoranda following NSTC deliberations instead of directives as the Administration contended that federal agencies are tasked with these issues, existing OSTP interacts with other EOP agencies and interagency coordination efforts are sufficient, and the federal agencies that develop and fund those programs should take a leadership role in coordinating activities.[69] Some in the S&T community, however,

(...continued)

ComptonLectureJFB.pdf.

[62] National Science Board, *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, and Mathematics Education System* (Ballston, VA: National Science Foundation, 2007) at http://www.nsf.gov/nsb/documents/2007/stem_action.pdf.

[63] National Science Board, *International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and Our Nation's Innovation Enterprise*, NSB 08-4 (Arlington, VA: National Science Foundation, 2008), at http://www.nsf.gov/nsb/publications/2008/nsb084.pdf. Jennifer Sue Bond, Mark Schaefer, David Rejeski, Rodney W. Nichols, *OSTP 2.0: Critical Upgrade: Enhancing Capacity for White House Science and Technology Policymaking: Recommendations for the Next President* (Washington, DC: Woodrow Wilson International Center for Scholars, June 2008) at http://wilsoncenter.org/news/docs/OSTP%20Paper1.pdf. Also, see CRS Report RL34503, *Science, Technology, and American Diplomacy: Background and Issues for Congress*, by Deborah D. Stine.

[64] Jennifer Sue Bond, Mark Schaefer, David Rejeski, Rodney W. Nichols, *OSTP 2.0: Critical Upgrade: Enhancing Capacity for White House Science and Technology Policymaking: Recommendations for the Next President* (Washington, DC: Woodrow Wilson International Center for Scholars, June 2008) at http://wilsoncenter.org/news/docs/OSTP%20Paper1.pdf.

[65] Ibid.

[66] Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf.

[67] For more information, see CRS Report 98-611, *Presidential Directives: Background and Overview*, by L. Elaine Halchin.

[68] A list is available at http://www.fas.org/irp/offdocs/direct.htm.

[69] Based on CRS discussions with Stanley Sokul, Bush Administration Chief of Staff, OSTP, August 25, 2008. Examples of some executive orders and memoranda regarding space and aerospace issues are available at http://www.ostp.gov/cs/issues/space_aeronautics and http://www.whitehouse.gov/news/releases/2006/12/20061220-7.html. See, for example, John H. Marburger, Director, OSTP, Testimony before the House Committee on Science and Technology, Subcommittee on Research and Science Education, *International Science and Technology Cooperation*, 110th Cong. 2nd sess., April 2, 2008, at http://democrats.science.house.gov/Media/File/Commdocs/hearings/2008/Research/2apr/Marburger_Testimony.pdf.

believe this puts S&T in a supportive role, regardless of the issue, rather than exerting the more prominent influence they believe S&T should have on public policy in some situations.[70]

Dr. Holdren's has stated the following regarding OSTP and interagency coordination and cooperation:

> There is an entity called the National Science and Technology council which has existed in the White House, organized by the Office of Science and Technology Policy, but bringing together all of the executive branch agencies, typically at the deputy level, that have roles in science and technology.
>
> This is a place where in the past; one has been able to address crosscutting and overlapping jurisdiction issues effectively. In the last eight years, it has languished, it was not really fully utilized in the last administration, but our intentions, certainly my intention, if confirmed, would be to revive it and utilize it fully to try to reduce the sorts of problems that you point to here.
>
> The other thing that I would mention again is, I think we have in prospect a set of people across the relevant agencies who are uncommonly experienced at communicating with each other. And beyond the structural approaches to this, through the NSTC for example, I think we are going to have some success in avoiding these problems that come from crosscutting issues and overlapping jurisdictions, just because we're going to talk to each other more.[71]

OSTP Role in the Communication of Scientific and Technical Information by Federal Agency Scientists and Engineers

The OSTP also plays in the communication of scientific and technical information developed and analyzed by federal scientists and engineers. For example, OSTP, as part of a process managed by OMB, reviews scientific- and technically-related testimony to Congress.

Bush Administration

During the Bush Administration, there were charges, primarily related to environment, public health, and national security issues, that the "integrity of science" was adversely affected through politicization.[72] These allegations contend that Administration officials restricted the ability of federal scientists and engineers to provide information, instructed them to change their research

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[70] Henry Kelly, Ivan Oelrich, Steven Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004) at http://www.fas.org/pubs/_docs/flying_blind.pdf.

[71] Congressional Quarterly Congressional Transcripts, "Senate Commerce, Science, and Transportation Committee Holds Meeting to Organize for the 111th Congress; and Hearing on the Nominations of Jane Lubchenco to Be Undersecretary For Oceans And Atmosphere; and John Holdren to Be Director of the Office of Science and Technology Policy at the Commerce Department," February 12, 2009.

[72] See, for example, Union of Concerned Scientists, *Scientific Integrity in Policymaking: An Investigation into the Bush Administration's Misuse of Science*, March 2004 at http://www.ucsusa.org/assets/documents/scientific_integrity/rsi_final_fullreport_1.pdf; Union of Concerned Scientists, *Federal Science and the Public Good: Securing the Integrity of Science in Policy Making*, February 2008 at http://ucsusa.org/scientific_integrity/solutions/big_picture_solutions/federal-science-and-the.html; and Rena Steinzor, Wendy Wagner, and Matthew Shudtz, *Saving Science from Politics: Nine Essential Reforms of the Legal System*, Center for Progressive Reform, July 2008 at http://www.progressivereform.org/articles/SavingScience805.pdf.

reports, or modified the congressional testimony of federal scientific and technical agency leadership that did not support the Administration's views. OSTP Director Marburger stated that such allegations are "sweeping generalizations based on a patchwork of disjointed facts and accusations that reach conclusions that are wrong and misleading."[73]

Policymakers responded to concerns about Bush Administration involvement in the communication of scientific and technical information by federal agency scientists and engineers in several ways. The America COMPETES Act (P.L. 110-69, §1009) directs OSTP to develop an overarching set of principles to ensure the communication and open exchange of data by federal scientists and engineers. On May 28, 2008, in response to this requirement, OSTP sent a memorandum to federal agencies that sponsor research. The memorandum provides guidance and the following "Core Principle for Communication of the Results of Scientific Research Conducted by Scientists Employed by Federal Civilian Agencies":

> Robust and open communication of scientific information is critical not only for advancing science, but also for ensuring that society is informed and provided with objective and factual information to make sound decisions. Accordingly, the Federal government is committed to a culture of scientific openness that fosters and protects the open exchange of ideas, data and information to the scientific community, policymakers, and the public.[74]

The memorandum also indicates that NASA's science communications policy should be a model for other federal agencies.[75] The NASA policy states that, "In keeping with the desire for a culture of openness, NASA employees may, consistent with this policy, speak to the press and the public about their work." Exceptions exist for privileged and other controlled information.

Science and Technology Policy Groups

Prior to President Obama's inauguration, some S&T policy advocacy groups proposed that the executive branch change its scientific communication policy.[76] Among the proposals were that an executive order be issued requiring federal agency leadership to monitor scientific integrity within their agency and submit an annual report to OSTP with their observations and actions.

Other proposed actions were reversing Executive Order 13422[77] so that OMB is not permitted to conduct a political review of scientific documents; enhancing whistleblower protections, including strengthening the Office of Special Counsel;[78] requiring that scientific studies used to

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[73] See, for example, OSTP, "Statement by President Bush's Science Adviser and Director of the Office of Science and Technology Policy John H. Marburger III on Union of Concerned Scientists Document and Press Release," press release at http://www.ostp.gov/galleries/press_release_files/jhmStatementUCS27-8-04.pdf.

[74] OSTP, "Principles for the Release of Scientific Research Results," Memorandum, May 28, 2008, at http://www.ostp.gov/galleries/default-file/Research%20Results.pdf. Note that this memorandum regards the communication of scientific data and information, not science and technology policy.

[75] NASA's policy is available at http://www.nasa.gov/pdf/145687main_information_policy.pdf.

[76] Union of Concerned Scientists, *Federal Science and the Public Good: Securing the Integrity of Science in Policy Making*, February 2008 at http://ucsusa.org/scientific_integrity/solutions/big_picture_solutions/federal-science-and-the.html; and Rena Steinzor, Wendy Wagner, and Matthew Shudtz, *Saving Science from Politics: Nine Essential Reforms of the Legal System*, Center for Progressive Reform, July 2008 at http://www.progressivereform.org/articles/SavingScience805.pdf.

[77] Executive Order 13422, "*Further Amendment to Executive Order 12866 on Regulatory Planning and Review*," 72 Federal Register 14, January 23, 2007, pp. 2763-2765, at http://edocket.access.gpo.gov/2007/pdf/07-293.pdf.

[78] The Office of Special Counsel is an independent agency that receives allegations of prohibited personnel practices, (continued...)

inform regulatory policy be disclosed and docketed prior to the decision-making process; reforming agency communication and media policies;[79] and providing the public with both the scientific results or analysis used in policymaking and the ability to include a minority report if there are any significant dissenting scientific evidence or opinions.[80]

Since President Obama's inauguration, some organizations have suggested that the Administration also address the use of science in regulatory policy including explicitly differentiating questions that involve scientific judgments and questions that involve judgments about economics, ethics, and other matters of policy; and developing guidelines on when to consult advisory panels on scientific questions, how to appoint them, how they should operate, and how to deal with conflicts of interest.[81]

Obama Administration

In his inauguration speech on January 20, 2009, President Obama stated, "We'll restore science to its rightful place, and wield technology's wonders to raise health care's quality and lower its cost. We will harness the sun and the winds and the soil to fuel our cars and run our factories. And we will transform our schools and colleges and universities to meet the demands of a new age. All this we can do. All this we will do."[82] President Obama has stated "promoting science isn't just about providing resources—it's about protecting free and open inquiry. It's about ensuring that facts and evidence are never twisted or obscured by politics or ideology. It's about listening to what our scientists have to say, even when it's inconvenient—especially when it's inconvenient. Because the highest purpose of science is the search for knowledge, truth and a greater understanding of the world around us. That will be my goal as President of the United States."[83]

Dr. Holdren has stated the following on the issue of the communication of scientific and technical information by federal scientists and engineers:

> 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

(...continued)

investigates such allegations, and conducts investigations of possible prohibited personnel practices on its own initiative, absent any allegation. For more information, CRS Report RL33918, *The Whistleblower Protection Act: An Overview*, by L. Paige Whitaker.

[79] For a discussion of this issue on an agency-specific basis, see Union of Concerned Scientists, *Freedom to Speak? A Report Card on Federal Agency Media Policies*, 2008 at http://www.ucsusa.org/assets/documents/scientific_integrity/Freedom-to-Speak.pdf.

[80] Union of Concerned Scientists, *Federal Science and the Public Good: Securing the Integrity of Science in Policy Making*, February 2008 at http://ucsusa.org/scientific_integrity/solutions/big_picture_solutions/federal-science-and-the.html; and Rena Steinzor, Wendy Wagner, and Matthew Shudtz, *Saving Science from Politics: Nine Essential Reforms of the Legal System*, Center for Progressive Reform, July 2008 at http://www.progressivereform.org/articles/SavingScience805.pdf.

[81] Bipartisan Policy Center, *Science for Policy Project*, Interim Report, March 10, 2009 at http://www.bipartisanpolicy.org/ht/a/GetDocumentAction/i/9982.

[82] White House, "President Barack Obama's Inaugural Address," Web page, January 20, 2009 at http://www.whitehouse.gov/blog/inaugural-address/.

[83] Dave Rochelson ,"The search for knowledge, truth and a greater understanding of the world around us," Change.gov: The Office of the President-Elect, website, December 20, 2008, at http://change.gov/newsroom/entry/the_search_for_knowledge_truth_and_a_greater_understanding_of_the_world_aro/.

> 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.[84]

In response to a question during the hearing, Dr. Holdren stated the following:

> The America Competes Act, signed into law in August 2007, actually requires the director of the Office of Science and Technology Policy to develop and issue an overarching set of principles to ensure the open communication of data and results from federal scientists, and to prevent the intentional or unintentional suppression or distortion of such research findings.
>
> That's actually a big challenge in thinking about scientific integrity in the federal government. I think getting it done is going to require clarifying policies for disseminating research results, developing processes for appealing those dissemination decisions, providing training to inform, reinforce and update managers, researchers and the public information staffs on those policies.[85]

On January 30, 2009, President Obama issued an executive order revoking executive order 13422 (discussed above), which addressed regulatory planning and review.[86] In addition, on March 9, 2009, President Obama assigned OSTP "the responsibility for ensuring the highest level of integrity in all aspects of the executive branch's involvement with scientific and technological processes.... Specifically,

> 1. Within 120 days from the date of this memorandum, the Director shall develop recommendations for Presidential action designed to guarantee scientific integrity throughout the executive branch, based on the following principles:
>
> (a) The selection and retention of candidates for science and technology positions in the executive branch should be based on the candidate's knowledge, credentials, experience, and integrity;
>
> (b) Each agency should have appropriate rules and procedures to ensure the integrity of the scientific process within the agency;
>
> (c) When scientific or technological information is considered in policy decisions, the information should be subject to well-established scientific processes, including peer review where appropriate, and each agency should appropriately and accurately reflect that information in complying with and applying relevant statutory standards;
>
> (d) Except for information that is properly restricted from disclosure under procedures established in accordance with statute, regulation, Executive Order, or Presidential Memorandum, each agency should make available to the public the scientific or technological findings or conclusions considered or relied on in policy decisions;

[84] Ibid.

[85] Ibid.

[86] *Revocation of Certain Executive Orders Concerning Regulatory Planning and Review*, January 30, 2009. For more information, see http://www.whitehouse.gov/the_press_office/Revocation-Of-Certain-Executive-Orders-Concerning-Regulatory-Planning-And-Review/.

> (e) Each agency should have in place procedures to identify and address instances in which the scientific process or the integrity of scientific and technological information may be compromised; and
>
> (f) Each agency should adopt such additional procedures, including any appropriate whistleblower protections, as are necessary to ensure the integrity of scientific and technological information and processes on which the agency relies in its decisionmaking or otherwise uses or prepares.
>
> 2. Each agency shall make available any and all information deemed by the Director to be necessary to inform the Director in making recommendations to the President as requested by this memorandum. Each agency shall coordinate with the Director in the development of any interim procedures deemed necessary to ensure the integrity of scientific decisionmaking pending the Director's recommendations called for by this memorandum."[87]

OSTP asked for public comments on each of the principles in item (1) above. The comment period ended on May 13, 2009.[88]

Stature and Influence of PCAST

Unlike NSTC, PCAST has not been the subject of much legislative activity. However, some in the S&T policy community believe that PCAST does not have the stature and influence it once had, and PCAST focuses now on a narrower set of issues less likely to be of presidential-level interest.[89] For example, they state that while President George H.W. Bush held the first PCAST meeting at Camp David and participated in PCAST meetings, Presidents Clinton and George W. Bush only met occasionally for short periods of time with the PCAST chair or committee members.

As a federal advisory committee, the PCAST is unusual in that the executive order creating it states it will be co-chaired by the OSTP Director and one of its members, as opposed to having an independent chair, not directly associated with the Administration. Most federal advisory committees do not have Administration staff as members of their committees or as chairs. If Administration staff are included as part of the advisory committee, it is generally in an ex-officio role (e.g., National Science Board). The inclusion of the OSTP Director as both member and co-chair may reduce PCAST's ability to provide independent thinking to the White House and may place the OSTP Director in an awkward position if PCAST members disagree with White House policy.

Some S&T policy organizations have suggested strengthening PCAST by broadening its mandate, explicitly including national and homeland security issues, enhancing its independence, and increasing its staff significantly.[90] These suggestions include recommendations to make the

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[87] White House, *Scientific Integrity*, March 9, 2009. For more information, see http://www.whitehouse.gov/the_press_office/Memorandum-for-the-Heads-of-Executive-Departments-and-Agencies-3-9-09/.

[88] The draft guidelines, and the comments on them, are available at http://blog.ostp.gov/2009/04/22/presidential-memo-on-scientific-integrity-request-for-comment/.

[89] Center for the Study of the Presidency, Study Group on Presidential Science and Technology Personnel Advisory Assets, "*Presidential Leadership to Ensure Science and Technology in Service of National Needs: A Report to the 2008 Candidates*," Summer 2008 at http://www.thepresidency.org/pubs/science_tech_2008.pdf.

[90] See for example, Carnegie Commission on Science, Technology, and Government, *Science & Technology and the President* (New York: Carnegie Corporation of New York, October 1988); Henry Kelly, Ivan Oelrich, Steven (continued...)

chair of PCAST solely one of its members, providing all members with security clearances, and appointing them to staggering and overlapping terms unrelated to presidential and congressional election cycles.

The S&T community also suggests that the number of Presidential advisory committees be increased. For example, some in the community propose advisory committees focused on specific issues of S&T policy issues, such as a Federal-State Science and Technology Council to enhance dialogue with the states, particularly on STEM education.[91] The primary challenges to implementing this recommendation are cost and Federal Advisory Committee Act (P.L. 92-463) requirements regarding justification of any new advisory committee, membership, and ethics rules (including financial disclosure) that may make it challenging to recruit committee members.[92] Other options are to commission non-federal advisory committees, such as those of the National Academies,[93] to address short-term topics of interest.

On November 20, 2008, the members of PCAST in the Bush Administration wrote a letter to the individuals who would succeed them as PCAST members.[94] The letter makes a number of recommendations to the next PCAST. Among these are that PCAST should

- Play a more active role in advising Congress on issues related to science and technology policy, at the direction of the President, rather than just delivering reports to Congress;
- Consider more congressional activity, where it is needed for the Administration to implement PCAST's recommendations; and
- Increase interactions of PCAST, as a group, with the President, and have more frequent sessions with the Office of Management and Budget (OMB), and the Council of Economic Advisors (CEA).

(...continued)

Aftergood, and Benn H. Tannenbaum, *Flying Blind: The Rise, Fall and Possible Resurrection of Science Policy Advice in the United States* (Washington, DC: Federation of American Scientists, 2004); and Center for the Study of the Presidency, Study Group on Presidential Science and Technology Personnel Advisory Assets, "*Presidential Leadership to Ensure Science and Technology in Service of National Needs: A Report to the 2008 Candidates*," Summer 2008 at http://www.thepresidency.org/pubs/science_tech_2008.pdf.

[91] Jennifer Sue Bond, Mark Schaefer, David Rejeski, Rodney W. Nichols, OSTP 2.0: Critical Upgrade: Enhancing Capacity for White House Science and Technology Policymaking: Recommendations for the Next President (Washington, DC: Woodrow Wilson International Center for Scholars, June 2008) at http://wilsoncenter.org/news/docs/OSTP%20Paper1.pdf; and Center for the Study of the Presidency, Study Group on Presidential Science and Technology Personnel Advisory Assets, "Presidential Leadership to Ensure Science and Technology in Service of National Needs: A Report to the 2008 Candidates," Summer 2008 at http://www.thepresidency.org/pubs/science_tech_2008.pdf.

[92] For more information, see CRS Report R40520, *Federal Advisory Committees: An Overview*, by Wendy R. Ginsberg.

[93] The National Academies is the collective name for the National Academy of Sciences (NAS), National Academy of Engineering (NAE), the Institute of Medicine (IOM), and the National Research Council (NRC). The NAS is a private, nonprofit organization, established by a congressional charter approved by Abraham Lincoln in 1863. The National Academies provide independent advice on science and technology matters. For more information on this organization and others, see CRS Report RL34454, *Science and Technology Policymaking: A Primer*, by Deborah D. Stine.

[94] President's Council of Advisors on Science and Technology, Letter to successors to the President's Council of Advisors on Science and Technology, November 20, 2008 at http://www.ostp.gov/galleries/PCAST/PCAST%20Transition%20Letter%202008-2.pdf.

President Obama has stated that PCAST will be "a vigorous external advisory council that will shape my thinking on the scientific aspects of my policy priorities."[95] He announced the new members of PCAST on April 27, 2009.[96] In making the announcement, he stated

> We also need to engage the scientific community directly in the work of public policy. And that's why, today, I am announcing the appointment—we are filling out the President's Council of Advisors on Science and Technology, known as PCAST, and I intend to work with them closely. Our co-chairs have already been introduced—Dr. Varmus and Dr. Lander along with John. And this council represents leaders from many scientific disciplines who will bring a diversity of experiences and views. And I will charge PCAST with advising me about national strategies to nurture and sustain a culture of scientific innovation. . . .
>
> In biomedicine, just to give you an example of what PCAST can do, we can harness the historic convergence between life sciences and physical sciences that's underway today; undertaking public projects—in the spirit of the Human Genome Project—to create data and capabilities that fuel discoveries in tens of thousands of laboratories; and identifying and overcoming scientific and bureaucratic barriers to rapidly translating scientific breakthroughs into diagnostics and therapeutics that serve patients.
>
> In environmental science, it will require strengthening our weather forecasting, our Earth observation from space, the management of our nation's land, water and forests, and the stewardship of our coastal zones and ocean fisheries.[97]

Options for Congress

Congress may consider several legislative options regarding OSTP. First, it may wish to evaluate whether or not OSTP is still needed within the EOP. If so, Congress can continue its current OSTP legislative guidance mechanisms, or it can increase the intensity with which it applies those mechanisms. Currently, the President has discretion over the policies, structure, and personnel of OSTP, NSTC, and PCAST. Congress annually oversees OSTP through the regular authorization and appropriation process and introduces issue-specific bills that identify actions and issues on which Members of Congress believe OSTP should focus. An alternative is for Congress to increase the intensity of its evaluation by holding oversight hearings on OSTP or by amending OSTP's authorization statute.

In evaluating various policy options, it may be important to consider whether the influence of the OSTP Director within the EOP depends more on a personal relationship with the President or on legislated action. Another factor may be the degree to which the President believes S&T advice should be an important factor in decision making. These options and issues are discussed in more depth below.

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[95] Dave Rochelson ,"The search for knowledge, truth and a greater understanding of the world around us," Change.gov: The Office of the President-Elect, website, December 20, 2008, at http://change.gov/newsroom/entry/the_search_for_knowledge_truth_and_a_greater_understanding_of_the_world_aro/.

[96] For a list of members, see http://www.ostp.gov/cs/pcast.

[97] The White House, Office of the Press Secretary, Remarks By The President At The National Academy Of Sciences Annual Meeting, April 27, 2009 at http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-at-the-National-Academy-of-Sciences-Annual-Meeting/.

Allow President Autonomy Over OSTP

Given OSTP's presence within the EOP, one option is for Congress to allow the President to manage OSTP as he or she wishes. The President, with Senate confirmation, would continue to appoint the OSTP Director and Associate Directors; determine OSTP's policy agenda; and organize the management of the office. The President could also continue to use executive orders to manage other activities, such as the formation of NSTC and PCAST.[98]

Some Members of Congress may believe that no changes need to be made in OSTP operations. Others may believe that taking legislative action regarding OSTP would be neither efficient nor effective given its presence in the EOP and the nature of its activities. As described in this report, OSTP and its affiliated organizations have constantly evolved, responding to the changing needs of the Administration and societal needs as well as new scientific and technical challenges and opportunities. This may be appropriate given the separation of powers between the legislative and executive branches inherent in the U.S. constitution.

Reevaluate Need for OSTP in the EOP

One fundamental question is whether high-level S&T advice is needed, and, if so, whether a full-time adviser or presidential advisory committee is needed within the EOP.[99] Presidents and their senior advisers may believe that most of their decisions are based on issues of value or value conflicts, so that their need for S&T knowledge is very general. They may feel no requirement for an S&T adviser or related presidential advisory committee to provide opinion or build support for White House decisions.

From a presidential perspective, if the S&T adviser or presidential advisory committee is not committed to the President's agenda and is not willing to represent the Administration's perspective, the President may believe that high-level S&T advice will provide more harm than good. If the S&T adviser has a close relationship with the President, the S&T community may fear this will lead to the politicization of S&T and subvert the S&T adviser's ability to provide independent advice. A historical review of presidential S&T activities since the F.D. Roosevelt Administration illustrates that a presidential S&T adviser or advisory committee may be placed in a challenging position when a difference in opinion exists between the President and the majority of the S&T community. The result may be dismissal or marginalization of S&T consideration from the White House inner circle.[100]

On the other hand, an S&T adviser who understands these sensitivities may be an asset to the Administration, providing confidential advice privately and speaking authoritatively on S&T-related issues for the Administration publically. The S&T adviser can help assess S&T related

[98] Note that other organizations besides OSTP, NSTC, and PCAST provide analysis and advice to the White House, Congress, and federal agencies. For example, Congress often asks that the National Academy of Sciences or the National Science Board provide this guidance. For more information on these organizations and others, CRS Report RL34454, *Science and Technology Policymaking: A Primer*, by Deborah D. Stine. For a discussion of this issue, see Roger Pielke, Jr., "Who Has the Ear of the President?," *Nature*, 450:347-348, November 15, 2007, at http://sciencepolicy.colorado.edu/admin/publication_files/resource-2574-2007.28.pdf.

[99] The discussion in this section is based on Chapter 8, "Science Advisers at the Presidential Level," in Bruce L.R. Smith, *The Advisers: Scientists in the Policy Process* (Washington, DC: The Brookings Institution 1992).

[100] Ibid.

departments and agencies, resolve competing claims among these agencies, coordinate the efforts of R&D agencies and the external S&T community in national emergencies, and anticipate new and emerging S&T issues. In addition, presidential advisory committees provide an ongoing ability to engage the S&T community each time the President feels the need for external advice.[101]

An alternative approach is making OSTP an independent agency rather than an agency of the EOP. This might lead to an OSTP that is more independent and provide a more optimal distance between the President and the OSTP director. Congress might also benefit from having a centralized source of independent S&T advice, and more control over OSTP's interagency coordination and other activities. If OSTP were no longer part of the EOP, however, it might also be viewed as sufficiently distant from Presidential decisions that neither the Administration or federal agencies would be sufficiently responsive to its advice or requests. The S&T community objected when a somewhat similar action was taken by President Nixon when he moved the precursor to OSTP from the EOP to NSF.

Continue Current OSTP Legislative Guidance Mechanisms

Congress currently holds hearings as part of the presidential appointee confirmation process, part of the appropriation process, and on issues of interest to a given committee. Through the hearing process and other legislative actions, such as introducing bills, passing laws, and writing related report language, Congress provides direction and guidance to OSTP.

One challenge in undertaking these actions is that OSTP might receive overlapping or conflicting instructions. Resolving these conflicts may prove to be difficult. Additionally, Congress may mandate actions taken by OSTP, but not provide additional funding. In such cases, OSTP may be forced to choose between prioritizing the general statutory activities or specifically mandated priorities due to limited funding.

Increase Intensity of OSTP Oversight Mechanisms

Should Congress wish to take more substantive action, it might consider holding specific oversight hearings on OSTP or amending OSTP authorizing statute, the National Science and Technology Policy, Organization, and Priorities Act of 1976 (P.L. 94-282) to reflect current Congressional priorities. For example, Congress might state in legislation that OSTP should designate staff or undertake activities specifically focused on an issue of concern. Establishing such specific priorities and personnel in statute would limit agency discretion, potentially reducing its ability to address other parts of its statutory mission, while securing a focus on specified topics. In addition, it may become challenging to respond to new and emerging S&T topics. For example, nanotechnology was not an issue during the Reagan Administration, while it is an issue today.

[101] Ibid.

Policy Option Considerations

When policymakers consider these and other options, one important factor is that the influence of the OSTP director, APST, science adviser, or technology adviser, regardless of their title, likely depends on the relationship between whomever is appointed to that position and the President. While one President may decide to rely heavily on the advice of such an office, another may decide to rely only minimally upon it.

Another factor for Congress to weigh may be the degree to which the President or other top EOP officials generally are interested in S&T policy and the degree to which they believe S&T advice should be an important factor in their decision making. Officials who do not consider S&T an important factor are less likely to solicit input from the S&T adviser. A related issue is the degree to which the President believes that the role of an S&T adviser is to support and express the views of the Administration, versus to provide independent advice and judgment. If the President prefers an S&T policy adviser who views their role as primarily supporting the Administration's perspective, there may be fundamental differences between the S&T adviser and the S&T community.

Activities in the 111th Congress

In the Omnibus Appropriations Act, 2009 (P.L. 111-8), Congress provides $5.3 million in funding for OSTP. In the explanatory statement accompanying the act, Congress stated that

> Not later than 120 days after the enactment of this Act, the reports identified below shall be submitted to the House and Senate Committees on Appropriations. Within the funds provided, OSTP shall:
>
> (1) working with NASA and the Department of Energy, develop a plan for restarting and sustaining U.S. domestic production of radioisotope thermoelectric generator material for NASA's future science and exploration missions;
>
> (2) working with NASA and NOAA, develop a plan and program to encourage commercial solutions to meet space-based Earth and space weather observation requirements of the United States government, similar to the Federal investments in NASA's commercial orbital transportation services (COTS) program. Such report shall consider the efficacy of providing appropriated funds to commercial entities to pursue low-cost atmospheric, environmental or space weather monitoring systems, and whether such funding should be offered to commercial entities in exchange for later concessionary rates on weather, climate or space weather data purchasers from successful vendors; and
>
> (3) convene a series of meetings to coordinate the research and development of the next generation of ground-based radar and to report the results of the meetings and a budget plan.

The Omnibus Public Land Management Act of 2009 (P.L. 111-11) states that "The Joint Subcommittee on Ocean Science and Technology of the National Science and Technology Council shall coordinate Federal activities on ocean acidification and establish an interagency working group."

Members of Congress have introduced a number of bills related to OSTP. Among these are

- **Great Lakes Collaboration Implementation Act** (S. 237) – establishes a National Invasive Species Council, an independent executive branch organization, that is to coordinate with OSTP and other organizations to implement a national management plan for invasive species.
- **Cybersecurity Act** (S. 773) – Directs the President, through OSTP, to conduct an annual review of all Federal cyber technology research and development investments.
- **National Hurricane Research Initiative Act** (H.R. 327) – Directs OSTP, through the NSTC, to coordinate activities carried out by the United States related to the National Hurricane Research Initiative as a formal program with a well defined organizational structure and execution plan.
- **National Nanotechnology Initiative Amendments Act of 2009** (H.R. 554) – Requires the OSTP Director to designate an OSTP associate director as the Coordinator for Societal Dimensions of Nanotechnology, and makes that individual responsible for oversight of the coordination, planning, and budget prioritization of activities required by the nanotechnology program to ensure that ethical, legal, environmental, and other appropriate societal concerns are considered during the nanotechnology development; and requires the NSTC to establish, under the Nanoscale Science, Engineering, and Technology Subcommittee, an Education Working Group to plan educational activities supported under the program.
- **Fulfilling the Potential of Women in Academic Science and Engineering Act** (H.R. 1144) – Requires the OSTP Director to develop a policy for federal science agencies to carry out a program of workshops that educate specified federally funded researchers about methods that minimize the effects of gender bias in the evaluation of federal research grants and in the related academic advancement of the recipients of these grants, transmit a report evaluating such program's impact in reducing gender bias towards women engaged in research funded by the federal government, develop a policy to extend research grant support and provide interim technical support for federally funded researchers who are caregivers, and transmit a copy to specified congressional committees.
- **National Water Research and Development Initiative** (H.R. 1145) – Directs the President to establish or designate an interagency committee, chaired by OSTP, to implement a National Water Research and Development Initiative to (1) develop a National Water Research and Assessment Plan; (2) coordinate all water-related federal research, development, demonstration, data collection and dissemination, education, and technology transfer activities; (3) encourage cooperation among federal agencies; and (4) facilitate technology transfer, communication, and opportunities for information exchange with various parties through a newly-established National Water Initiative Coordination Office that would provide technical and administrative support to the committee).
- **STEM Education Coordination Act** (H.R. 1709) – Requires the OSTP Director to establish an NSTC committee to (1) coordinate the STEM education activities and programs of federal agencies; (2) develop, implement through participating agencies, and update once every five years, a five-year STEM education strategic plan; and (3) establish, periodically update, and maintain an inventory of federally sponsored STEM education programs and activities, including

documentation of assessments of the effectiveness of such programs and activities. In addition, the OSTP Director is required to annually report to Congress on the STEM education strategic plan.

- **International Science and Technology Cooperation Act** (H.R. 1736) – Requires the OSTP Director to establish an NSTC committee to (1) plan and coordinate interagency international science and technology cooperative research and training activities and partnerships supported or managed by Federal agencies; (2) establish Federal priorities and policies for aligning, as appropriate, international S&T cooperative research and training activities and partnerships supported or managed by Federal agencies with the foreign policy goals of the United States; (3) identify opportunities for new international S&T cooperative research and training partnerships that advance both the science and technology and the foreign policy priorities of the United States; (4) work with international S&T counterparts to establish international S&T cooperative research and training partnerships; and (5) establish, periodically update, and maintain an inventory of all nonclassified international S&T cooperative research and training activities and partnerships that involve an annual U.S. Federal investment of at least $500,000. The OSTP Director is to annually report to Congress describing the priorities and policies related to international S&T cooperative research and training activities.
- **National Windstorm Impact Reduction Reauthorization Act of 2009** (H.R. 2627) – Replaces OSTP with the National Institute of Standards and Technology (NIST) as lead Federal agency for planning, management, and coordination of the National Windstorm Impact Reduction program.

Appendix. President's Science and Technology Policy Advisers

Table A-1. President's Science and Technology Policy Advisers, Executive Office of the President Agency, Interagency Coordination Organization, and Advisory Committee, 1941-2009

President	Advisers with Title(s) (Years in Office)	Executive Office of the President Agency (Year Established)	Interagency Coordination Organization[a] (Year Established)	Advisory Committee (Year Established)
F.D. Roosevelt	**Vannevar Bush**[b] (1941-1945), Director, Office of Scientific Research and Development	Office of Scientific Research and Development (OSRD; 1941)		Science Advisory Board (1933)
Truman	**John Steelman**[b] (1946-1947), Special Assistant to the President (1945-1946); Assistant to the President (1946-1953); Chairman, The President's Scientific Research Board (1946-1947)		The President's Scientific Research Board (1946-1947);[c] Interdepartmental Committee for Scientific Research (1947)[c]	Science Advisory Committee (SAC) of the Office of Defense Mobilization (1946)[c]
	Oliver Buckley[b] (1951-1952); Chair, Science Advisory Committee (SAC)			
	Lee DuBridge[b] (1952-1953), Chair, SAC			
Eisenhower	**Lee DuBridge** (1953-1956), Chair, SAC; Science Adviser to the President	Office of the Special Assistant to the President for Science and Technology (1957)	Federal Council for Science and Technology (FCST) (1959)	SAC (1953-56); President's Science Advisory Committee (PSAC; 1957, replaced SAC).
	Isidor I. Rabi (1956-1957), Chair, SAC; Science Adviser to the President			
	James Killian, Jr. (1957-1959), Special Assistant to the President for Science and Technology; Chair, President's Science Advisory Committee (PSAC)			
	George Kistiakowsky (1959-1961), Special Assistant to the President for Science and Technology; Chair, PSAC			

President	Advisers with Title(s) (Years in Office)	Executive Office of the President Agency (Year Established)	Interagency Coordination Organization[a] (Year Established)	Advisory Committee (Year Established)
Kennedy	**Jerome Wiesner** (1961-1963), Special Assistant to the President for Science and Technology; Director, OST; Chair, FCST; Chair, PSAC	Office of Science and Technology (OST; 1962)	FCST	PSAC
Johnson	**Jerome Wiesner** (1963-1964), Special Assistant to the President for Science and Technology; Director, OST; Chair, FCST; Chair, PSAC **Donald Hornig** (1964-1969), Special Assistant to the President for Science and Technology; Director, OST; Chair, FCST: Chair, PSAC	OST	FCST	PSAC
Nixon[d]	**Lee DuBridge** (1969-1970), Science Adviser to the President; Director, OST **Edward David, Jr**. (1970-1973), Science Adviser to the President; Director, OST **H. Guyford Stever** (1973-1974), Science Adviser to the President; Chair, FCST	OST (until 1973, when office abolished)[d]	FCST	PSAC (until 1973, when member resignations were accepted, and no new appointments were made).
Ford	**H. Guyford Stever** (1974-1977); Science Adviser to the President; Director, Office of Science and Technology Policy (OSTP)	Office of Science and Technology Policy (1976)	Federal Coordinating Council for Science, Engineering, and Technology (FCCSET; 1976, replaced FCST)	Intergovernmental Science, Engineering, and Technology Panel (ISETAP; 1976);[e] President's Council on Science and Technology (PCST; 1976)
Carter	**Frank Press** (1977-1981); Science and Technology Advisor to the President; Director, OSTP; Chair, FCCSET	OSTP	FCCSET dissolved as statutory entity and reestablished under an executive order (1978)	PCST (until 1978, abolished with its functions transferred to President by executive order); ISETAP (in 1978, dissolved as statutory entity and reestablished under an executive order)
Reagan	**George Keyworth, II** (1981-1985), Science Adviser to the President; Director, OSTP **William R. Graham** (1986 - 1989), Science Adviser to the President; Director, OSTP	OSTP	FCCSET	White House Science Council (1982; reports to Science Adviser, not President; established by Science Adviser, not executive order)

President	Advisers with Title(s) (Years in Office)	Executive Office of the President Agency (Year Established)	Interagency Coordination Organization[a] (Year Established)	Advisory Committee (Year Established)
G.H.W. Bush	**D. Allan Bromley** (1989-1993), Assistant to the President for Science and Technology; Director, OSTP; Chair, PCAST	OSTP	FCCSET	President's Council of Advisors on Science and Technology (PCAST; 1990)
Clinton	**John Gibbons** (1993-1998), Assistant to the President for Science and Technology; Director, OSTP; Co-Chair, PCAST **Neal Lane** (1998-2001), Assistant to the President for Science and Technology; Director, OSTP; Co-Chair, PCAST	OSTP	National Science and Technology Council (NSTC; 1993)	PCAST (Name changed to President's Committee of Advisors on Science and Technology; 1993)
G.W. Bush	**John Marburger, III** (2001-2009), Science Adviser to the President; Director, OSTP; Co-Chair, PCAST	OSTP	NSTC	PCAST (Name changed back to President's Council of Advisors on Science and Technology; 2001)
Obama	**John P. Holdren** (2009-current), Assistant to the President for Science and Technology; Director, OSTP; Co-Chair, PCAST	OSTP	NSTC	PCAST

Sources: Congressional Research Service. The table is based on information from the following sources: Public Papers of the Presidents (Washington, DC: GPO) with the following volumes were used as references: Dwight D. Eisenhower (1957, 1960); Lyndon B. Johnson (1962, 1966, 1967); Richard M. Nixon (1969, 1970, 1973), Gerald Ford (1976-1977), Jimmy Carter (1977, 1978), Ronald Reagan (1981, 1983, 1986), and George H.W. Bush (1989); Jeffrey K. Stine, A History of Science Policy in the United States, 1940-1985, Report for the House Committee on Science and Technology Task Force on Science Policy, 99th Congress, 2nd session, Committee Print (Washington, DC: GPO, 1986), available at http://ia341018.us.archive.org/2/items/historyofscience00unit/historyofscience00unit.pdf; William T. Golden (ed.), Science Advice to the President (New York: Pergamon Press, 1979); William G. Wells, Science Advice and the Presidency: 1933-1976. Dissertation, School of Government and Business Administration (Washington, DC: George Washington University, 1977); OSTP, "Previous Science Advisers," website at http://www.ostp.gov/cs/about_ostp/previous_science_advisors, accessed September 19, 2008; Truman Library at http://www.trumanlibrary.org/hstpaper/steelman.htm.; "Lee Alvin DuBridge (Part II) (1901-1993), Interviewed by Judith R. Goodstein," Oral History, February 20, 1981, California Institute of Technology Archives at http://oralhistories.library.caltech.edu/68/01/OH_DuBridge_2.pdf; Nixon Presidential Library Archives, Officials of Administration at http://nixon.archives.gov/thelife/apolitician/thepresident/officialsofadministration.php; John T. Woolley and Gerhard Peters, The American Presidency Project [online], Santa Barbara, CA: University of California (hosted), Gerhard Peters (database) at http://www.presidency.ucsb.edu/; National Archives, "Records of the Office of Science and Technology," webpage at http://www.archives.gov/research/guide-fed-records/groups/359.html. Other sources include Executive Orders 9912, 9913, 10807, 12039, 12881, 12882, 13226; Reorganization Plan No. 2 of 1962; Reorganization Plan No. 1 of 1973; and Reorganization Plan No. 1 of 1977: Executive Order 9912, "Establishing the Interdepartmental Committee on Scientific Research and Development," 12 Federal Register 8799, December 27, 1947 at http://www.presidency.ucsb.edu/ws/index.php?pid=60725; Executive Order 9913, "Terminating the Office of Scientific Research and Development and Providing for the Completion of its Liquidation," 12 Federal Register 8799, December 27, 1947 at http://www.presidency.ucsb.edu/ws/index.php?pid=78155; Executive Order 10807, "Federal Council for Science and Technology, 24 Federal Register 1897, March 17, 1959; Executive Order 12039, "Relating to the Transfer of Certain Science and Technology Policy Functions," 43 Federal Register 8095; February 28, 1978 at http://www.presidency.ucsb.edu/ws/index.php?pid=30416; Executive Order 12881, "Establishment of the National Science and Technology Council," 58 Federal Register 226, November 23, 1993, p. 62491 at http://www.archives.gov/federal-register/executive-orders/pdf/12881.pdf; Executive Order 12882, "Executive Order 12882 - President's Committee of Advisors on Science and Technology," 58 Federal Register 226, November 26, 1993, p. 62493 at http://www.archives.gov/federal-register/executive-orders/pdf/12882.pdf; Executive Order 13226, "President's Council of

Advisors on Science and Technology," 66 Federal Register 192, October 3, 2001, pp. 50523-52524 at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=fr03oc01-141.pdf; U.S. President (Kennedy), "Special Message to the Congress Transmitting Reorganization Plan 2 of 1962," Public Papers of the Presidents of the United States: John F. Kennedy, 1962, March 29, 1962, at http://www.presidency.ucsb.edu/ws/index.php?pid=24601&st=Reorganization+Plan+No.+2+of+1962&st1=; U.S. President (Nixon), "Message to the Congress Transmitting Reorganization Plan 1 of 1973 Restructuring the Executive Office of the President," Public Papers of the Presidents of the United States: Richard M. Nixon, January 26, 1973, at http://www.presidency.ucsb.edu/ws/index.php?pid=3819&st=Reorganization+Plan+No.+1+of+1973&st1=; U.S. President (Carter), "Executive Office of the President Message to the Congress Transmitting Reorganization Plan No. 1 of 1977," Public Papers of the Presidents of the United States: Jimmy Carter, July 15, 1977, at http://www.presidency.ucsb.edu/ws/index.php?pid=7809&st=Reorganization+Plan+No.+1+of+1977&st1=.

Notes: The science advisers may have additional titles not represented in this table. In recent times, the hierarchy of assistants to the President within the White House Office is as follows, going from high to low: Assistant to the President, Deputy Assistant to the President, Special Assistant to the President. (National Archives and Records Administration, The United States Government Manual 2007-2008 (Washington, DC: GPO, 2007) at http://www.gpoaccess.gov/gmanual/browse-gm-07.html.)

a. President Theodore Roosevelt appointed the Committee on the Organization of Scientific Work to assess the central organization of government scientific bureaus (agencies) with a focus on eliminating duplication.

b. Opinions differ on who is the first presidential science adviser. During the Bush Administration, the OSTP website stated Oliver Buckley was the first science advisor, and did not include either Vannevar Bush or John Steelman in its list of presidential science advisors. Others believe the latter two individuals were presidential science advisers as well. As OSRD Director, Vannevar Bush, submitted a report, *Science: The Endless Frontier*, to the President Franklin Roosevelt Administration that is the foundation for today's federal S&T policy. President Truman asked that John Steelman, as Director of War Mobilization and Reconversion in the EOP, chair a Presidential Scientific Research Board that was to make recommendations on how to enhance coordination and efficiency of federal R&D. Once this report was released, President Truman asked Steelman, a Presidential Assistant, to act as a liaison between the President and the newly formed Interdepartmental Committee on Scientific Research and Development. Buckley, DuBridge, and Rabi were all Chairs of the Science Advisory Committee and as such, were given the title of Presidential science advisers. For more discussion of this issue, see "Oral History Interview with William T. Golden" at http://www.trumanlibrary.org/oralhist/goldenw.htm.

c. For an understanding of the charges to the different scientific advisory boards and committees, see "Letter to the Chairman, Science Advisory Committee" at http://trumanlibrary.org/publicpapers/viewpapers.php?pid=301; executive order establishing the President's Scientific Research Board, available at http://www.trumanlibrary.org/executiveorders/index.php?pid=467; and the Interdepartmental Committee for Scientific Research, available at http://www.trumanlibrary.org/publicpapers/index.php?pid=1847&st=&st1=.

d. On January 26, 1973, as part of a reorganization plan, the Office of Science and Technology within the Executive Office of the President was abolished. All of its duties, including that of Science Adviser, were transferred to the National Science Foundation (NSF). As a result, the NSF Director became the Science Adviser. For more details, see http://www.presidency.ucsb.edu/ws/index.php?pid=3819&st=&stl=.

e. ISETAP members included the OSTP Director, NSF Director, and state, local, and regional officials.

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