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The Office of Science and Technology Policy (OSTP): Overview and Issues for Congress

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SUMMARY

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The Office of Science and Technology Policy (OSTP): Overview and Issues for Congress

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) 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." The act further charged the OSTP Director with specific advisory duties within the Executive Office of the President (EOP), including providing "advice on the scientific, engineering, and technological aspects of issues that require attention at the highest level of Government."

Currently, the White House science and technology (S&T) advisory structure consists of OSTP and two advisory councils: the National Science and Technology Council (NSTC) and the President's Council of Advisors on Science and Technology (PCAST).

The President nominates the OSTP Director, who is subject to confirmation by the Senate. In some Administrations, the President has concurrently appointed the OSTP Director to the position of Assistant to the President for Science and Technology (APST), often referred to as the President's "science advisor," a position which allows for the provision of confidential advice to the President on matters of science and technology. Arati Prabhakar, President Biden's nominee to serve as Director of OSTP, was confirmed by the Senate on September 22, 2022. President Biden also appointed Prabhakar to serve concurrently as Assistant to the President for Science and Technology and as a member of his Cabinet. President Biden became the first U.S. President to appoint a Science Advisor to the President's Cabinet, an advisory governmental body consisting of the Vice President, the heads of the 15 executive branch departments, and other designated top executive branch officials.

When designated to do so by the President, the APST convenes and chairs the NSTC, a cabinet-level body of advisors to the President on S&T policies and issues. Established in 1993 by Executive Order 12881, the NSTC is composed of representatives from departments and agencies with significant S&T responsibilities and is charged with coordinating S&T policy across the federal government. OSTP staff chair or co-chair most of the committees, subcommittees, and interagency working groups of the NSTC. OSTP staff provide operational and administrative support to the NSTC.

The Director of OSTP co-chairs PCAST. Established in 1990 by Executive Order 12700, PCAST is an independent Federal Advisory Committee composed of external advisors who advise the President on matters involving policy affecting science, technology, and innovation as well as on matters involving S&T information needed to inform public policy in other areas. OSTP staff provide operational and administrative support to PCAST.

Congress appropriated $7.96 million for OSTP in FY2023 an increase of 19.7% above the FY2022 enacted level. In addition to appropriations for the office provided in the annual Commerce, Justice, Science, and Related Agencies appropriations acts, OSTP receives indirect support from two federal agencies: the National Science Foundation (NSF), which provides funding for the Science and Technology Policy Institute, a federally-funded research and development center that supports OSTP, and the Department of Energy (DOE), which provides funding for PCAST.

OSTP is statutorily charged with advising the President on S&T matters; coordinating the implementation of S&T priorities across the federal government; and engaging with external partners in industry, academia, civil society organizations, and other governmental bodies. Accordingly, several issues related to the activities and focus of OSTP (as well as the advisory bodies it supports, the NSTC and PCAST) are of potential interest to Congress, including staffing practices and potential conflict-of-interest concerns; workplace culture and past congressional oversight activity; the efficacy of federal S&T coordination; persistent vacancies of Senate-confirmed leadership positions within OSTP; and the stature and influence of PCAST.

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Introduction

Science and technology policy issues tend to reach the presidential level if they involve multiple agencies; have substantial budgetary, economic, national security, or foreign policy dimensions; are highly controversial (especially when science and technology intersect with values, ethics, and morality); or are highly visible to the public. When these matters reach the Oval Office, Presidents generally seek information and advice from trusted sources as to the options available and their implications.

Throughout U.S. history, Presidents have used a variety of mechanisms, including informal contacts as well as advisory boards and committees, to obtain science and technology (S&T) advice within the Executive Office of the President (EOP), enhance interagency coordination, and receive counsel from outside advisors. Lacking a statutory foundation, however, these boards and committees tended to lack permanency, as subsequent Presidents often disbanded them. When again faced with the need for S&T advice, Presidents would form new advisory boards or committees, sometimes reconstituted from previously disbanded ones.

In 1976, after President Nixon abolished the existing White House science advisory structure, Congress moved to codify a formal mechanism for presidential science advice. The National Science and Technology Policy, Organization, and Priorities Act of 1976 (P.L. 94-282) established the Office of Science and Technology Policy (OSTP), including the position of its Director, within the EOP to provide scientific and technological analysis and advice to the President. This act codified and institutionalized a presidential science advice function that previously existed at each President's discretion.

Currently, the White House S&T advisory structure consists of OSTP and two advisory bodies: the National Science and Technology Council (NSTC) and the President's Council of Advisors on Science and Technology (PCAST).

This report provides an overview of OSTP, PCAST, and the NSTC; describes each entity's background, structure, and roles and responsibilities; and discusses selected issues for Congress.

Office of Science and Technology Policy

Situated within the EOP, OSTP provides advice to the President on S&T policies as well as the use of S&T in addressing national concerns or challenges. Within its statutory authorities, the composition and policy focus of OSTP has varied according to the priorities of different presidential administrations.

This section discusses OSTP's background, statutorily mandated responsibilities, and current organization and policy focus, as well as its past and present budget and staffing levels.

Overview and Background

With P.L. 94-282, Congress established the Office of Science and Technology Policy to, among other things, "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."[1]

Under President Biden, OSTP describes its mission as working to "maximize the benefits of science and technology to advance health, prosperity, security, environmental quality, and justice

[1] P.L. 94-282.

for all Americans." OSTP states that the specific duties it performs in service to this mission include

- providing advice to the President and the Executive Office of the President on all matters related to science and technology;
- stewarding the creation of bold visions, unified strategies, clear plans, wise policies, and effective, equitable programs for science and technology, working with departments and agencies across the federal government and with Congress;
- engaging with external partners, including industry, academia, philanthropic organizations, and civil society; state, local, tribal and territorial governments; and other nations; and
- working to ensure inclusion and integrity in all aspects of science and technology.[2]

OSTP also has several roles not articulated in these formal statements. These include serving as a sounding board and conduit of information for agency executives seeking to understand, clarify, and shape science and technology-related policy objectives and priorities; helping agencies coordinate and integrate their S&T strategies and activities; and helping resolve interagency conflicts over areas of S&T responsibility and leadership.

Organization

P.L. 94-282 (as amended and codified at 42 U.S.C. §6611) established the basic organizational structure for OSTP.[3] Current statute allows for one office head—the OSTP Director—to be nominated by the President and confirmed by the Senate; not more than four Associate Directors, also to be nominated by the President and confirmed by the Senate; and a Chief Technology Officer (CTO), who also serves as an Associate Director and who is subject to confirmation by the Senate.

Beyond the positions authorized in statute, individual presidential administrations may choose to structure OSTP according to their preferences and policy priorities. As **Figure 1** illustrates, the Biden Administration's OSTP is composed of the Director's Office and six policy teams: Climate and Environment; Energy; Health and Life Sciences; National Security; Science and Society; and the U.S. Chief Technology Officer (also referred to as the Tech Team). In contrast, under President Trump, OSTP had three divisions: Science, Technology, and National Security.

Leadership

The creation of OSTP provided a new structure for the provision of science and technology policy advice to the President, but did not end Presidents' authority to appoint advisors in parallel. The OSTP director is a statutory position; the authority to appoint others to assist the President exists solely with the President. Thus, a President may opt to appoint the OSTP director to also serve as an assistant to the President, may concurrently appoint another individual to serve as Assistant to the President for Science and Technology (APST), or may appoint no one to serve as APST. This variety of options also raised new and continuing questions with respect to coordination of advice.

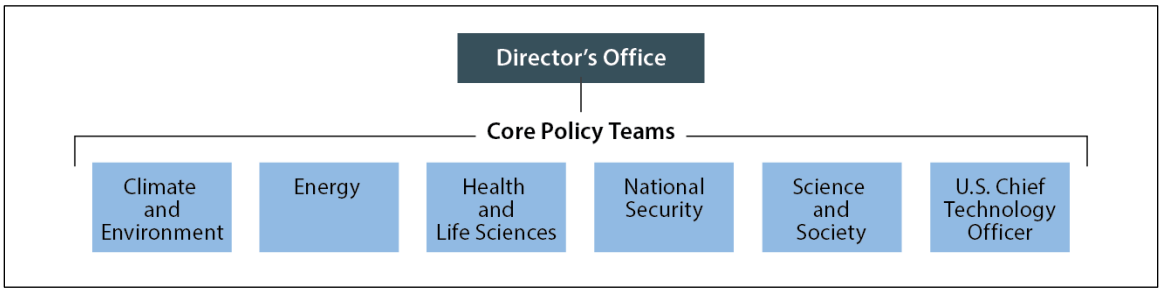
[2] The White House, "Office of Science and Technology Policy," available at https://www.whitehouse.gov/ostp.

[3] 42 U.S.C. §6611.

For example, as of February 2023, Arati Prabhakar serves concurrently as OSTP Director and Assistant to the President for Science and Technology. Similarly, during the Obama, Clinton, and George H. W. Bush administrations, the OSTP Director also simultaneously held the title of APST. In contrast, during the Trump and George W. Bush administrations the OSTP Director did not serve as the APST.

The difference between an individual being the OSTP Director and the APST is more than semantic. This section discusses the two positions, including differences in their authority (both statutory and presidentially-vested), and roles and responsibilities, as well as associated policy implications.

Figure 1. OSTP Organization Under President Biden



Source: OSTP organization as of February 2023. White House, "OSTP's Teams," at https://www.whitehouse.gov/ostp/ostps-teams. CRS graphic.

OSTP Director

P.L. 94-282 established the position of OSTP Director, who is appointed by the President and sometimes referred to colloquially as the President's science advisor. The OSTP Director is subject to Senate confirmation and receives compensation at the rate provided for level II of the Executive Schedule.

OSTP Director's primary function 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.

In addition, the statute, as amended,[4] directs the OSTP Director to

> advise the President of scientific and technological considerations involved in areas of national concern including, but not limited to, the economy, national security, homeland security, health, foreign relations, the environment, and the technological recovery and use of resources;
>
> evaluate the scale, quality, and effectiveness of the federal effort in science and technology and advise on appropriate actions;
>
> advise the President on scientific and technological considerations with regard to federal budgets, assist the Office of Management and Budget (OMB) with an annual review and analysis of funding proposed for research and development in budgets of all federal agencies, and aid [OMB] and the agencies throughout the budget development process; and

[4] Section 1712(1) of P.L. 107-296 inserted "homeland security" after "national security" in the list of areas of national concern.

> assist the President in providing general leadership and coordination of the research and development programs of the Federal Government.

The OSTP Director advises the President on policy formulation; presidential appointments; S&T-related budget issues, including budgets for R&D; the policy significance of scientific and technical developments; and science, technology, engineering, and mathematics (STEM) education. OSTP Directors historically have also served as communication conduits between the EOP and the federal and nonfederal S&T community. Some OSTP Directors have emphasized communicating the views of the S&T community to the EOP, while others have focused on communicating the views of the EOP to the S&T community.

The OSTP Director performs special roles with respect to national security and emergency preparedness (NS/EP) communications policies, programs, and capabilities. Under Executive Order 13618,[5] the OSTP Director advises the President on the prioritization of radio spectrum and wired communications that support NS/EP communications functions, and provides selected evaluation of appropriate information related to the test, exercise, evaluation, and readiness of the capabilities of existing and planned NS/EP communications.

Assistant to the President for Science and Technology (APST or "Science Advisor")

Unlike the OSTP Director's position, the role of APST does not require Senate confirmation and may confer additional status and access to the President.

As previously stated, some Presidents have chosen to appoint the person serving in the Senate-confirmed OSTP Director role to also serve as the APST. The statute does not require, nor may Congress compel, that the President appoint the OSTP Director to serve as an assistant to the President (or, more specifically, as APST).

The relationship between Congress and the individual tasked with leading the White House science advisory structure may depend, in part, on whether the individual serves as OSTP Director, APST, or both. The executive branch has previously asserted that close presidential advisors are immune from compelled congressional testimony. That position, however, has been rejected by various congressional committees and by the only court to directly address the question.[6]

The APST manages the National Science and Technology Council, established by Executive Order 12881, which is charged with coordinating S&T policy across the federal government, establishing national goals for federal S&T investments, and preparing coordinated R&D strategies. As NSTC manager, the APST can provide federal agency coordination, information, and guidance when special events occur, such as national emergencies, disasters, or S&T-related international negotiations.

In addition, the APST co-chairs the President's Council of Advisors on Science and Technology (PCAST), established in its current form under President Obama by Executive Order 13539. As co-chair of PCAST, the APST can seek to ascertain the consensus of the S&T community on issues of interest to the Administration.

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[5] Executive Order 13618, "Assignment of National Security and Emergency Preparedness Communications Functions," July 11, 2012, http://www.gpo.gov/fdsys/pkg/FR-2012-07-11/pdf/2012-17022.pdf.

[6] CRS Legal Sidebar LSB10301, *Legislative Purpose and Adviser Immunity in Congressional Investigations*, by Todd Garvey.

Associate Directors

In addition to establishing the position of OSTP Director, P.L. 94-282 authorizes the President to appoint not more than four OSTP Associate Directors, subject to Senate confirmation, who are compensated at a rate not to exceed that provided for level III of the Executive Schedule.

The number of Senate-confirmed Associate Director positions has varied under different presidential administrations according to preference and control of the Senate. For example, President Trump filled one Associate Director during his term, President Obama filled four Associate Director positions, President George W. Bush filled two, and President Clinton filled four.[7]

As of February 2023, all OSTP Associate Director positions are vacant. Rather, each of the six core policy teams is headed by a Deputy Director, Principal Assistant Director, or Principal Deputy U.S. CTO—positions that do not require presidential nomination or Senate confirmation.[8]

Table 1. OSTP Policy Teams Under President Biden

Policy Team	Description
The Climate and Environment Team Led by OSTP's Deputy Director for Climate and Environment	"The Climate and Environment Team strives to: 1. Provide clear, useful, and usable science and knowledge to inform the Administration's climate, environment, and nature policies, actions and initiatives by engaging across the Federal community as the clear voice of science, coordinating relevant science and policy processes, collaborating with partners, and connecting with stakeholders outside of government on issues related to climate and environment; 2. Ensure the Federal Government is a source of credible, useful, science-based information on climate, nature, and the environment; 3. Advance equity and inclusion, including through respectful and thoughtful engagement and the development of knowledge and science-based policies and processes that enhance equity, environmental justice, and opportunities for all."
The Energy Team Led by OSTP's Deputy Director for Energy and Chief Strategist for the Energy Transition	"The Energy Team provides science and policy expertise on energy and net-zero emissions technologies, and leads coordination on net-zero emissions innovation for the Biden-Harris Administration. OSTP Energy has deep technical and policy expertise, and helps develop innovation priorities for mid-to-long term technologies to ensure the success and rapid adoption needed for a clean, secure, and equitable clean energy transition."

[7] Office of Science and Technology Policy (OSTP), "OSTP Full of Firsts," *White House OSTP Blog*, September 24, 2010, available at https://obamawhitehouse.archives.gov/blog/2010/09/24/ostp-full-first; Jim Dawson, "OSTP Associate Directors Confirmed," *Physics Today*, September 2002, p. 33, available at https://physicstoday.scitation.org/doi/abs/10.1063/1.4796856; "Clinton Nominates Physicists for Key OSTP Positions," *APS News*, November 1997, available at https://www.aps.org/publications/apsnews/199711/ostp.cfm; CRS discussions with Stanley Sokul, Chief of Staff, George W. Bush Administration OSTP, August 14, 2008.

[8] Will Thomas, "Biden Rounding Out Appointments to Top Science Positions," *FYI Bulletin, American Institute for Physics*, September 8, 2021, available at https://www.aip.org/fyi/2022/biden-rounding-out-appointments-top-science-positions.

Policy Team	Description
The Health and Life Sciences Team Led by OSTP's Deputy Director for Health and Life Sciences	"The Health and Life Sciences Team is advancing a portfolio that demonstrates the critical importance of science and technology in improving human health, and the role of life sciences in addressing the highest priorities of the Biden-Harris Administration. Building on lessons learned from the historic COVID-19 pandemic and unprecedented opportunities in the life sciences, the Health and Life Sciences Team's priority efforts include: bio-preparedness, including pandemic preparedness, antimicrobial resistance, and biosecurity, health systems and health equity, accelerating biomedical innovation to patients, and innovation across the life sciences enterprise, including agriculture, biotechnology, and biomanufacturing. The team's approach includes seeking systemic science and technology policy opportunities that crosscut health and life sciences goals."
The National Security Team Led by OSTP's Principal Assistant Director for National Security[a] The National Security Team also includes the National Quantum Coordination Office (NQCO), which supports and coordinates activities related to the National Quantum Initiative.[b]	"The National Security Team advances the President's agenda by strengthening our long-term global competitiveness and reducing catastrophic risks through the assessment, development, deployment, and governance of current and emerging technologies. To strengthen global competitiveness, the team works to develop long-term science and technology (S&T) strategies, improve S&T intelligence, shape new investments in foundational technologies, modernize national security systems, ensure supply chain security, cultivate an agile innovation base, enhance export and investment controls, and build the world's best STEM workforce. They also work to reduce catastrophic risks at the intersection of technology and global security, spanning nuclear, biological, cyber, and autonomous technologies, associated risks of war, pandemics, and large-scale disasters, as well as emergent risks in space, ocean, and polar domains."
The Science and Society Team Led by OSTP's Deputy Director for Science and Society	"The Science and Society Team advances the President's commitment to ensuring all of America can participate in, contribute to, and benefit from science and technology. An inaugural White House team, Science and Society's role is to develop evidence-based policy at the intersection of science, technology, and innovation, reflecting the perspectives of the individuals and communities who make up civil society. The Science and Society Team directs priority efforts to protect the integrity of science in the federal government, broaden participation in STEM fields, strengthen the U.S. research infrastructure and its security, and ensure that all Americans have equitable access to the benefits of new and emerging technologies and scientific innovation."
The U.S. Chief Technology Officer (CTO) Team Led by OSTP's Principal Deputy U.S. CTO and Deputy U.S. CTO[c] The U.S CTO Team also includes the National Artificial Intelligence Initiative Office (NAIIO), which advances and coordinates federal work and policy on AI, and the U.S. Chief Data Scientist.	"The U.S. Chief Technology Officer (CTO) Team works to maximize the benefits of technology and data for all Americans. This includes ensuring that the U.S. government can leverage tech and data to effectively deliver services that U.S. policy is informed by tech and data expertise, and that America continues to lead the world in values-driven technological research and innovation. For example, the CTO Team works to harness the benefits of artificial intelligence (AI) for the American people while identifying and mitigating its pitfalls. It also works to ensure the U.S. government has the capacity to use data and technology to equitably and efficiently deliver services to achieve key policy priorities. Crucially, the CTO Team coordinates across the U.S. government to establish clear policies governing public and private sector use of technologies, and to ensure all administration policy is tech-informed."

Source: The White House, "OSTP's Teams," available at https://www.whitehouse.gov/ostp/ostps-teams/.

Notes:

a. As of February 6, 2023, the position of Deputy Director for National Security is vacant.

b. The National Quantum Coordination Office, "The National Quantum Coordination Office," available at https://www.quantum.gov/nqco/.

c. According to OSTP, "the team will be led by the Chief Technology Officer (CTO) of the United States after a U.S. CTO has been nominated by the President and confirmed by the Senate." As of February 6, 2023, President Biden has not nominated a U.S. CTO.

Roles and Responsibilities

In addition to the roles and responsibilities executed by the Director, OSTP exercises its science advisory and policy coordination duties through the work of its six policy teams (described in **Table 1**), its role in the NSTC, and support of PCAST.

The policy teams help coordinate government-wide initiatives that fall within specific policy areas. For example, OSTP's Climate and Environment Team supports the participation of the Director, or the Director's designee, in federal coordinating bodies such as the Arctic Executive Steering Committee, which "meets regularly to shape priorities, establish strategic direction, oversee implementation, and ensure coordination of Federal activities in the Arctic."[9]

OSTP may issue general policy frameworks to facilitate the development and implementation of agency policies in alignment with the President's priorities. These may take the form of OSTP-published white papers and strategy documents. For example, in October 2022, OSTP released a "Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People," containing "a set of five principles and associated practices to help guide the design, use, and deployment of automated system to protect the rights of the American public in the age of artificial intelligence."[10]

Additionally, through its role in the NSTC, OSTP participates in issuing policy guidance for federal science research agencies—for example, on research security,[11] advanced manufacturing initiatives,[12] and orbital debris.[13]

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[9] The White House, OSTP Climate and Environment Team, "Arctic Executive Steering Committee (AESC)," available at https://www.whitehouse.gov/ostp/ostps-teams/climate-and-environment/arctic-executive-steering-committee-aesc/. The Climate and Environment Team's Deputy Director has also participated in cross-government initiatives such as the Northern Bering Sea Climate Resilience Area (NBSCRA); see The White House, "Readout of the Northern Bering Sea Climate Resilience Area (NBSCRA) Joint Bering Federal Task Force and Bering Intergovernmental Tribal Advisory Council Meeting, June 3, 2022," available at https://www.whitehouse.gov/wp-content/uploads/2022/06/06-2022-Readout-of-the-NBSCRA-JOINT-BFTF-BITAC-Meeting.pdf.

[10] The White House, OSTP, "Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People," October 2022, available at https://www.whitehouse.gov/wp-content/uploads/2022/10/Blueprint-for-an-AI-Bill-of-Rights.pdf.

[11] Subcommittee on Research Security, Joint Committee on the Research Environment, *Guidance for Implementing National Security Presidential Memorandum 33 (NSPM-33) on National Security Strategy for United States Government-Supported Research and Development*, National Science and Technology Council, January 2022, available at https://www.whitehouse.gov/wp-content/uploads/2022/01/010422-NSPM-33-Implementation-Guidance.pdf.

[12] Subcommittee on Advanced Manufacturing, Committee on Technology, *National Strategy for Advanced Manufacturing*, National Science and Technology Council, October 2022, available at https://www.whitehouse.gov/wp-content/uploads/2022/10/National-Strategy-for-Advanced-Manufacturing-10072022.pdf.

[13] Orbital Debris Interagency Working Group, Subcommittee on Space Weather, Security, and Hazards, *National Orbital Debris Implementation Plan*, National Science and Technology Council, available at https://www.whitehouse.gov/wp-content/uploads/2022/07/07-2022-NATIONAL-ORBITAL-DEBRIS-

S&T Priority-Setting and the Federal Budget Process

A primary means by which OSTP fulfills its statutory duties to establish, coordinate, and implement S&T priorities across the federal government is through its participation in the federal budget process. OSTP works with Office of Management and Budget (OMB) during each budget cycle during the development of the President's budget proposal to Congress. This generally involves four steps: (1) S&T priority setting, (2) agency preparation of budget proposals to OMB, (3) agency negotiations with OMB, and (4) final budget decisions by the President and the OMB Director.

1. **Priority setting.** 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 individual agency responsibilities for specific activities when multiple agencies share responsibility for broad issue areas. OSTP and OMB use this information in their development of a joint memorandum that articulates the Administration's R&D priorities and R&D investment criteria.[14] Agencies are encouraged to use this memorandum as an aid in the second step, preparation of their budgets.
2. **Agency budget preparation.** In the second step, OSTP continually interacts with agencies as they develop their budgets, providing advice and working with them on their priorities. In general, OSTP provides more guidance to agencies with large R&D budgets and to programs that cross agency boundaries. Federal agencies submit their completed budget proposals to OMB. OSTP does not review proposed agency budgets before they are sent to OMB.
3. **Agency negotiations with OMB.** In the third step, OSTP works with OMB to review proposed agency budgets to ensure they reflect Administration plans and priorities. The OSTP also participates in OMB budget examiner presentations to the OMB Director and provides advice on priorities at that time. In addition, OSTP provides direct feedback to agencies as they negotiate with OMB over funding levels and the programs on which that funding is to be spent.
4. **Final budget decisions.** OSTP's primary role in the fourth step of the budget process is to advise on the quality of the agency budget proposals and their alignment with the President's established priorities. The President, the OMB Director, and the Cabinet, however, make the ultimate choices.

Budget and Staffing

OSTP's budget and staffing levels have varied considerably over time. Budget levels affect how many staff salaries OSTP can support, as well as other aspects of its operations. OSTP has traditionally been staffed by a combination of permanent staff, political appointees, individuals on assignment from federal agencies, individuals on temporary assignment from outside the federal government, and fellows.

Congress appropriated $7.96 million for OSTP in FY2023, an increase of 19.7% above the FY2022 enacted level (see **Table 2**).[15] Though the enacted appropriations legislation does not

IMPLEMENTATION-PLAN.pdf.

[14] On July 31, 2018, OMB and OSTP issued a joint memorandum on science and technology priorities for FY2020 (https://www.whitehouse.gov/wp-content/uploads/2018/07/M-18-22.pdf).

[15] P.L. 117-328.

specify staffing levels, the President's FY2023 budget requested support for 46 full-time equivalent personnel (FTE), an increase of 13 FTE from the estimated FY2022 level.[16]

Table 2. OSTP Funding, FY2020-FY2023

(in current dollars)

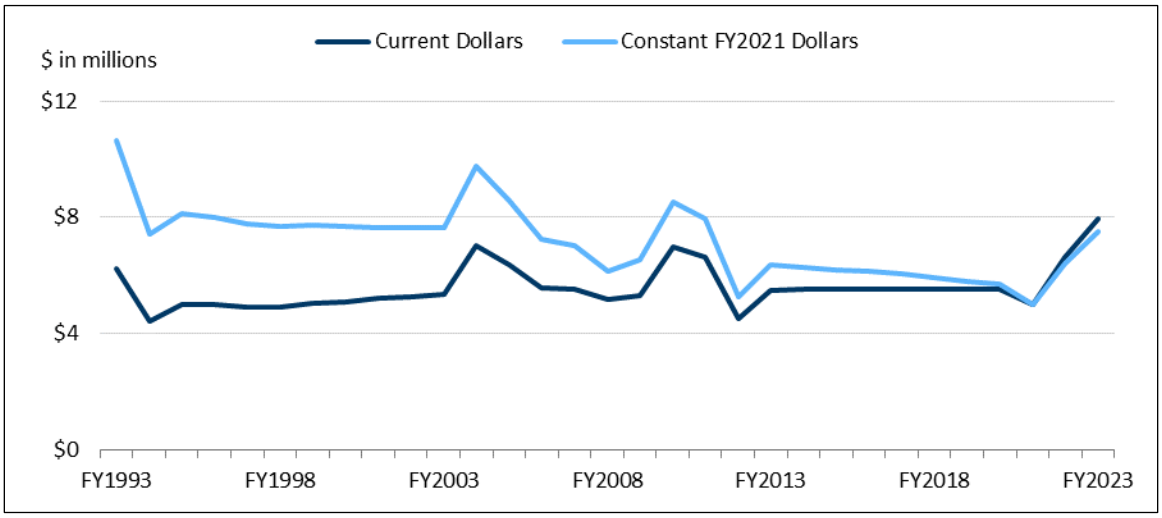
Fiscal Year	Requested	Enacted
FY2020	5,000,000	5,544,000
FY2021	5,544,000	5,000,000
FY2022	5,544,000	6,652,000
FY2023	7,965,000	7,965,000

Sources: CRS analysis of President's Budget Requests from FY2020-FY2023 and P.L. 116-93, P.L. 116-260, P.L. 117-103, and P.L. 117-328.

Figure 2 shows OSTP funding levels in current dollars and FY2021 constant dollars from FY1992 to FY2023. During the selected period, OSTP funding levels in FY2021 constant dollars reached a high point in FY1993 ($10.6 million) and low in FY2021 ($5.0 million).

In FY2012, Congress reduced funding for OSTP by $2.1 million (32.3%) (in FY2012 current dollars); contemporaneously, the Administration transferred responsibility for funding PCAST to the Department of Energy (DOE) (DOE funding for PCAST is not reflected in **Figure 2**).

Figure 2. OSTP Funding, FY1993-FY2023



Sources: CRS analysis of data from OMB Public Budget Database, budget requests, and congressional appropriations acts and committee reports from FY1993-FY2023; converted to constant FY2021 dollars using the GDP (Chained) Price Index listed in OMB Table 10.1 "Gross Domestic Product and Deflators Used in the Historical Tables: 1940-2027," available at https://www.whitehouse.gov/omb/budget/historical-tables.

Note: The above chart reflects appropriated funding levels and does not include potential transfers of funds.

OSTP staffing levels peaked during the mid-1990s with 36 FTEs, dipping to a low of 19 FTEs in 2018 (see **Figure 3**). The number of FTEs requested in the President's budget and enacted by

[16] Data reported are in full-time equivalents (FTE, the amount of effort from one full-time employee over one year) and may not equal number of staff. Data do not include staff or FTEs funded by agencies other than OSTP, such as detailees, IPAs, and fellows. Historical data includes full-time equivalent of holiday and overtime hours.

Congress for each fiscal year reflects only the number of authorized staff which may receive direct support from OSTP. OSTP FTEs represent a fraction of those working at OSTP as it also relies heavily on additional staffing provided through a variety of mechanisms:

- **Detailees.** A detail is an officially approved temporary assignment of a civil service employee (informally called a "detailee") to a different position in another federal agency; the employee's official title, series, grade, rate of compensation, and permanent employer do not change.
- **IPAs.** The Office of Personnel Management's Intergovernmental Personnel Act Mobility Program provides for the temporary assignment of personnel (IPAs) between the federal government and state and local governments, colleges and universities, Indian tribal governments, federally funded research and development centers, and other eligible organizations.
- **Fellows.** In the OSTP context, fellows are scientists and engineers who come to Washington, DC, to gain experience in public policy and provide science and technical advice to policymakers. Their salaries are often funded by external organizations, such as academic societies and foundations. Most are recent graduates of doctoral programs, but some are more experienced staff from industry or universities. Fellows generally come for one year, but that time can be extended.

These types of positons may provide a mechanism for OSTP to fill staffing needs without additional appropriations designated for such purposes as detailees are funded by their home agencies; fellows are funded by a variety of organizations; and IPAs may be funded by OSTP, their home agencies or organizations, or a combination of the two.[17]

As of February 6, 2023, OSTP has not publicly disclosed the total number of political staff, career staff, consultants, detailees, IPAs, and fellows employed by the office. CRS analysis of available staffing information may suggest that OSTP employs a high ratio of such staffing categories when compared to reported FTE levels. As previously noted, OSTP annually reports FTE staffing levels and reported an estimated 33 FTEs in FY 2022 and 46 FTEs in FY 2023 (as shown by **Figure 3**). In addition to these estimates, OSTP published a staff list on October 20, 2022, which lists a total of 136 staff.[18]

According to OSTP, as of February 14, 2020, OSTP's workforce under the Trump Administration consisted of 4 political staff, 21 career staff, 2 unpaid consultants, 1 paid consultant, 34 detailees, 4 IPAs, and 5 fellows.[19] During the Obama Administration, OSTP began with approximately 30 and ended with approximately 70 detailees, IPAs, and fellows. During the G.W. Bush Administration, OSTP had approximately 30-40 detailees per year. Toward the end of the Clinton Administration, OSTP had approximately 60 detailees and fellows.[20]

[17] Office of Science and Technology Policy, personal communication, March 23, 2016. In an earlier email (January 24, 2012) to CRS, OSTP asserted that it may reimburse agencies for all or part of the personnel costs, but is not required to do so under the terms of 3 U.S.C. 112, the provisions of which apply only to the White House Office, the Executive Residence at the White House, the Office of the Vice President, the Domestic Policy Staff, and the Office of Administration.

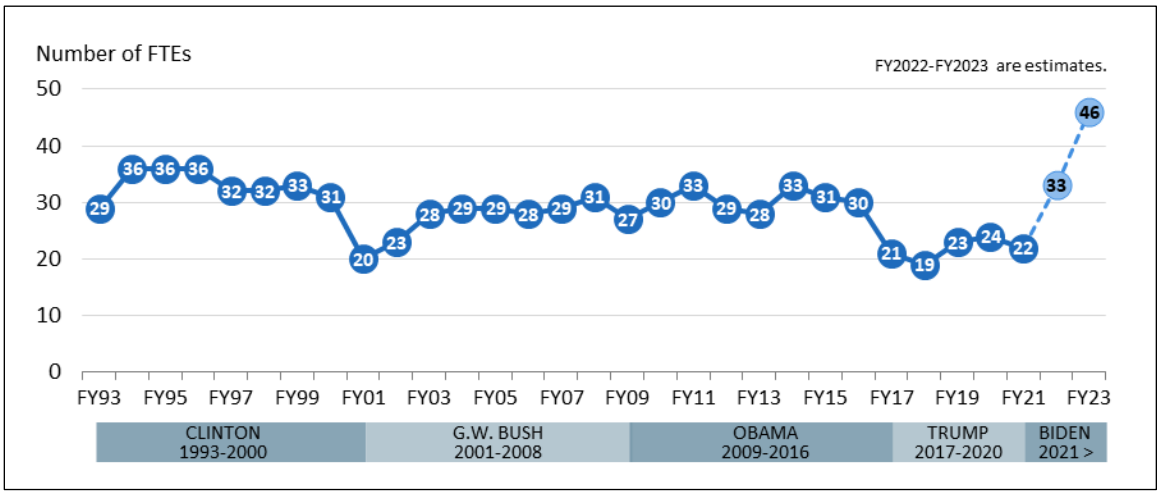
[18] "OSTP Staff as of October 20, 2022," available at https://www.whitehouse.gov/wp-content/uploads/2022/10/OSTP-Staff-10-20-2022.pdf.

[19] Email communication from OSTP to CRS, February 26, 2020.

[20] Email communication from OSTP to CRS, July 27, 2017.

Figure 3. OSTP Full-Time Equivalent (FTE) Levels

FY1993-FY2023



Source: CRS analysis of data from OMB, *Budget of the United States Government*, FY1993-FY2023. (Note that actual staffing numbers are provided two years later. For example, actual staffing for FY2018, comes from the FY2020 budget request.) OMB did not provide this data for FY2001. CRS has estimated the number of FTEs for FY2001 based on information provided by OSTP. FY2022 and FY2023 FTE levels are listed as "estimates" in the FY2023 budget request.

Notes: Data reported are in full-time equivalents (FTE, the number of regular hours worked by a full-time employee over one year) and may not equal number of staff. Data do not include staff or FTEs funded by agencies other than OSTP, such as detailees, IPAs, and fellows. Historical data includes full-time equivalent of holiday and overtime hours.

OSTP is also supported by a federally funded research and development center (FFRDC), the Science and Technology Policy Institute (STPI; see box below), which is staffed and funded through the National Science Foundation appropriation. STPI funding for FY2022 was $4.74 million.[21] The President requested $5.68 million for STPI for FY2023.[22]

Science and Technology Policy Institute

The Science and Technology Policy Institute (STPI) is a federally funded research and development center (FFRDC) that provides analytical support to the Office of Science and Technology Policy, the National Science Foundation (NSF), and the National Science Board. Congress created STPI through the National Defense Authorization Act for Fiscal Year 1991 (P.L. 101-510). This law established the Critical Technologies Institute (CTI), an FFRDC under the sponsorship of OSTP and supported by appropriations provided to the Department of Defense (DOD). The RAND Corporation initially managed CTI. In 1998, Congress enacted the National Science Foundation Authorization Act of 1998 (P.L. 105-207), which changed CTI's name to the Science and Technology Policy Institute, changed primary sponsorship to the National Science Foundation, and amended the institute's duties.

In 2003, the Institute for Defense Analyses (IDA) was selected to manage STPI. Congress provides funding for STPI through NSF appropriations, including $4.74 million in FY2022[a] and a requested $5.68 million for FY2023.[b] As of 2022, STPI has approximately 40 full-time employees.[c]

The duties of STPI include:

[21] Email communication from STPI to CRS, January 19, 2023.

[22] National Science Foundation (NSF), *National Science Foundation FY2023 Budget Request to Congress*, p. IA-2, March 28, 2022, https://www.nsf.gov/about/budget/fy2023/pdf/fy2023budget.pdf; also see NSF "Integrative Activities Funding Tables," at https://www.nsf.gov/about/budget/fy2023/tables.jsp#oia.

(1) The assembly of timely and authoritative information regarding significant developments and trends in science and technology research and development in the United States and abroad.

(2) Analysis and interpretation of the information referred to in paragraph (1) with particular attention to the scope and content of the federal science and technology research and development portfolio as it affects interagency and national issues.

(3) Initiation of studies and analysis of alternatives available for ensuring the long-term strength of the United States in the development and application of science and technology, including appropriate roles for the federal government, state governments, private industry, and institutions of higher education in the development and application of science and technology.

(4) Provision, upon the request of the Director of the Office of Science and Technology Policy, of technical support and assistance

(A) to the committees and panels of the President's Council of Advisors on Science and Technology that provide advice to the Executive Branch on science and technology policy; and

(B) to the interagency committees and panels of the federal government concerned with science and technology.[d]

In carrying out these duties, the statute directs STPI to consult widely with representatives from private industry, academia, and nonprofit institutions, and to incorporate their views in STPI's work to the maximum extent practicable. In addition, the statute requires STPI to submit an annual report to the President on its activities, in accordance with requirements prescribed by the President.

In addition to its primary customer, OSTP, and its sponsor, NSF, STPI has conducted work for other federal entities including: the National Institutes of Health; Department of Transportation; DOD; Department of Health and Human Services; National Science Board; Department of Commerce, including the National Institute of Standards and Technology; Department of Homeland Security; and Department of Energy.

a. Email communication from STPI to CRS, January 19, 2023.

b. National Science Foundation (NSF), National Science Foundation FY2023 Budget Request to Congress, p. IA-2, March 28, 2022, https://www.nsf.gov/about/budget/fy2023/pdf/fy2023budget.pdf; also see, NSF "Integrative Activities Funding Tables," at https://www.nsf.gov/about/budget/fy2023/tables.jsp#oia.

c. Full-time employees are defined as those with approximately 80% or more of their work time devoted to STPI work.

d. 42 U.S.C. 6686.

National Science and Technology Council

The National Science and Technology Council (NSTC) is a cabinet-level body created by executive order to advise the President and coordinate science and technology policy. Composed of agency and department heads as well as other advisors to the President, the main functions of the NSTC are to:

> Coordinate the S&T policy-making process; ensure that S&T policy decisions and programs are consistent with the President's policy priorities; integrate the President's S&T policy agenda across the Federal Government; ensure that S&T are considered in developing and implementing Federal policies and programs; and to further international S&T cooperation.[23]

This section discusses the background and context for the NSTC's creation and federal S&T coordination duties, its organization, and responsibilities.

[23] The White House, "National Science and Technology Council," available at https://www.whitehouse.gov/ostp/nstc.

Overview and Background

President Clinton established the NSTC by Executive Order 12881 on November 23, 1993.[24] The council was preceded by a number of interdepartmental bodies charged with coordinating S&T policy and research across the federal government, highlighting the long-standing importance of S&T policy coordination.

Federal support for scientific research had grown during the 1930s and early 1940s. Motivated by a desire to harness S&T developments to address the great economic depression of the 1930s and to support the nation's increasing involvement in World War II during the early 1940s, the U.S. federal government channeled increased funds into existing and newly created federal science agencies.[25] As S&T funding and programs proliferated, the need to coordinate disparate R&D activities and initiatives across the federal government became apparent. Preceding organizations focused on interagency coordination included the President's Scientific Research Board (Truman), the Interdepartmental Committee on Scientific Research and Development (ICSRD; Truman, Eisenhower), the Federal Council for Science and Technology (FCST; Eisenhower, Kennedy, Johnson, Nixon), and the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET; Ford, Carter, Reagan, George H. W. Bush).

Organization

Executive Order 12881 specifies that the President shall preside over NSTC meetings. It also states that, when directed by the President, the Vice President or the Assistant to the President for Science and Technology (APST) may convene council meetings. In practice, though, the NSTC is more commonly chaired by the APST or OSTP Director. For example, both the Biden and Trump Administrations have identified the OSTP Director as the NSTC chair. Under President Biden, Arati Prabhakar serves as NSTC chair. Though Prabhakar concurrently serves as OSTP Director and APST, the NSTC website and NSTC-published reports cite her title as OSTP Director.[26] Likewise, under the Trump Administration, OSTP Director Kelvin Droegemeier exercised NSTC management authority.

In addition to the APST or OSTP Director, NSTC membership is composed of the Vice President, Cabinet Secretaries and agency heads with significant S&T responsibilities, and other White House office heads as designated by the President.[27] In practice, the NSTC rarely meets with the President or Cabinet-level officials present. Rather, OSTP staff and detailees conduct NSTC activities in conjunction with federal agency staff.

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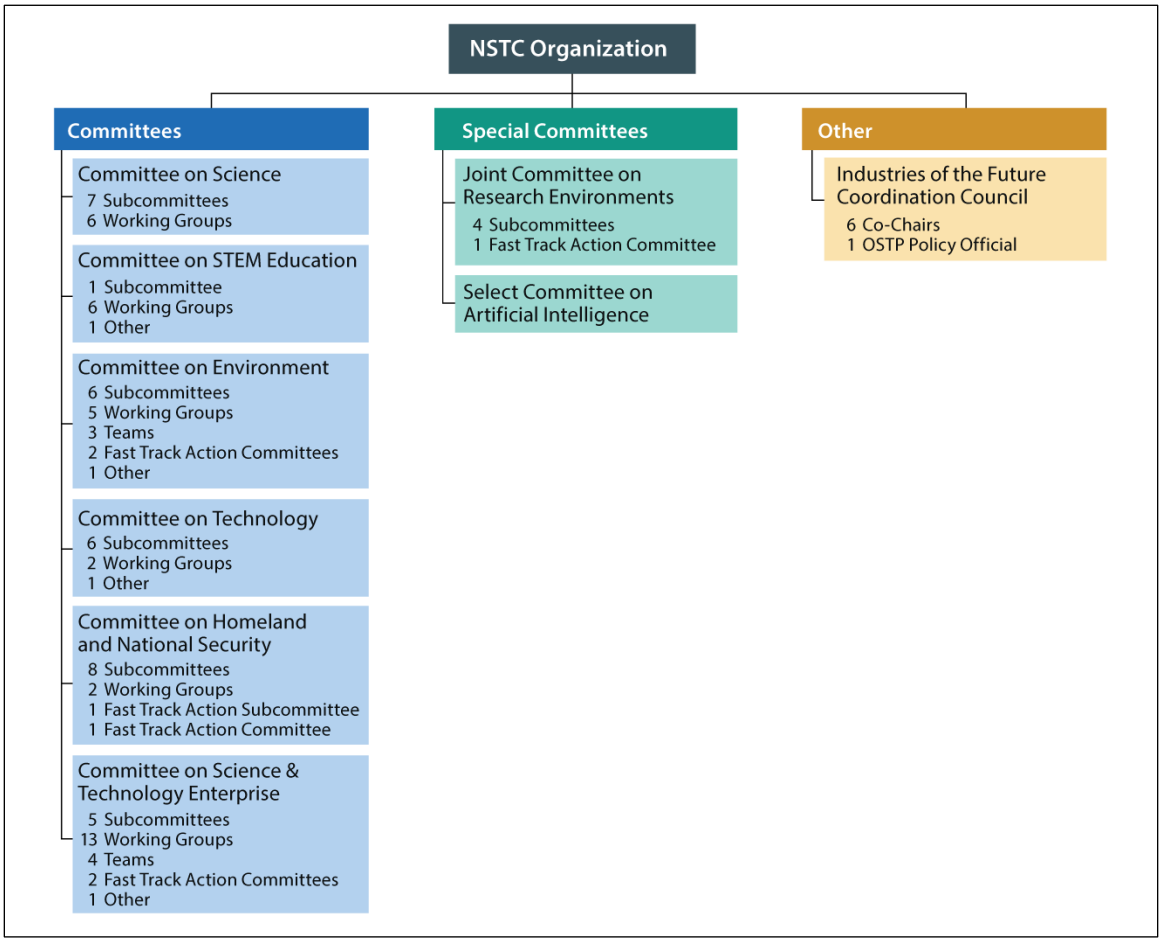
[24] Executive Order 12881, "Establishment of the National Science and Technology Council," 58 *Federal Register* 62491-62492, November 23, 1993.

[25] Examples include the Office of Scientific Research and Development (created in 1941), the Office of Naval Research (created in 1946), and the Atomic Energy Commission (created in 1946). For more on federal support for science research during the 1930s and 1940s, see Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities*, Johns Hopkins Paperbacks edition ed. (Baltimore: Johns Hopkins University Press, 1986).

[26] The White House, "National Science and Technology Council," available at https://www.whitehouse.gov/ostp/nstc; National Science and Technology Council, "National In-Space Servicing, Assembly, and Manufacturing Implementation Plan," In-Space Servicing, Assembly, and Manufacturing Interagency Working Group, December 2022, p. iii, available at https://www.whitehouse.gov/wp-content/uploads/2022/12/NATIONAL-ISAM-IMPLEMENTATION-PLAN.pdf.

[27] Executive Order 12881, "Establishment of the National Science and Technology Council," 58 *Federal Register* 62491-62492, November 23, 1993; White House, "National Science and Technology Council," available at https://www.whitehouse.gov/ostp/nstc.

Figure 4. National Science and Technology Council Overview



Source: CRS visualization of NSTC organization chart provided by OSTP via email communication on October 28, 2022.

Under President Biden, the work of the NSTC is organized under six committees (see **Figure 4**), which are co-chaired by an OSTP representative and an agency or department representative: the Committee on Science (COS), the Committee on STEM Education (Co-STEM), the Committee on Environment (CoE), the Committee on Technology (CoT), the Committee on Homeland and National Security (CHNS), and the Committee on Science and Technology Enterprise (CSTE).

Each NSTC committee has subcommittees, interagency working groups, and taskforces or other bodies focused on specialized topics (see **Appendix A**). The members of these committees and subcommittees are generally sub-Cabinet officials and lower-ranking staff.

Roles and Responsibilities

NSTC responsibilities are primarily derived by Executive Order (as previously discussed) and congressional mandates in statute. For example, Congress has charged the NSTC with specific statutory responsibilities, including the coordination of a number of federal initiatives and programs, including ocean acidification research and mitigation efforts,[28] STEM education

[28] P.L. 111-11, "The Omnibus Public Land Management Act of 2009," §12403.

support,[29] advanced manufacturing research and development activities,[30] the dissemination and long-term stewardship of the results of unclassified research,[31] and research facilities and major instrumentation planning and evaluation.[32]

Congress has also directed the NSTC to fulfill comparatively broad congressional mandates. For example, the America COMPETES Act (P.L. 110-69) directs the establishment of a President's Council on Innovation and Competitiveness (codified at 15 U.S.C. 3718). The act states that the council is to include the Secretary or head of a number of federal agencies, OSTP, and OMB. Congress provided the President with the option of establishing a new organization to serve as the Council on Innovation and Competitiveness or to designate an existing council to carry out the requirement. Rather than establish a new, independent council, President George W. Bush assigned the role of the President's Council on Innovation and Competitiveness to the NSTC Committee on Technology (CoT).[33]

The NSTC largely executes its coordination responsibilities through the work of its subcommittees and interagency working groups (see **Figure 4**). In some cases, the coordination of a multi-agency R&D initiative is also supported by a national coordination office (NCO).

How the NSTC Coordinates Federal R&D Initiatives Through Its Subcommittees, Working Groups, and National Coordination Offices

NSTC subcommittees, interagency working groups, and NCOs each play distinct roles in the coordination, assessment, and execution of multi-agency R&D initiatives. For example, the NSTC Committee on Science and Technology Enterprise formed the Subcommittee on Networking & Information Technology Research & Development (NITRD) to coordinate the activities of the multi-agency NITRD Program (established by P.L. 102-194), described as the "primary source of federally funded work on pioneering information technologies (IT) in computing, networking, and software."[34]

The NITRD Subcommittee, whose members are representatives appointed by relevant federal agencies and departments, functions as a steering body in guiding the overall focus and planning of NITRD Program activities. As of FY2022, R&D activities and initiatives within the NITRD Program were organized into 12 program areas that ranged from computing-enabled networked physical systems to artificial intelligence R&D.[35]

These program areas largely align with the scope of individual interagency working groups that are organized under the NITRD Subcommittee. Such working groups are staffed with technical experts from participating agencies who contribute relevant subject matter knowledge that informs the development of interagency R&D priorities in a specified program area.

[29] P.L. 111-358, "America COMPETES Reauthorization Act of 2010," §101.

[30] P.L. 111-358, "America COMPETES Reauthorization Act of 2010," §102.

[31] P.L. 111-358, "America COMPETES Reauthorization Act of 2010," §103.

[32] P.L. 110-69, "America COMPETES Act," §1007.

[33] Memorandum of the President of the United States, "Designation of the Committee on Technology of the National Science and Technology Council to Carry Out Certain Requirements of the America COMPETES Act," 73 *Federal Register* 20523, April 10, 2008.

[34] The NITRD Subcommittee was first established as the High Performance Computing and Communications program, which was established by the High Performance Computing Act of 1991, P.L. 102-194; for a description of the program and NSTC Subcommittee see Subcommittee on Networking and Information Technology Research and Development and Machine Learning and Artificial Intelligence Subcommittee, *The Networking & Information Technology R&D Program and the National Artificial Intelligence Initiative Office*, National Science and Technology Council, Supplement to the President's FY2023 Budget, December 2022.

[35] U.S. Government Accountability Office, *Federal Research and Development: Funding Has Grown Since 2012 and Is Concentrated Within a Few Agencies*, GAO-23-105396, December 2022, p. 45, available at https://www.gao.gov/assets/gao-23-105396.pdf.

Finally, the NITRD National Coordination Office (NCO) provides operational support for the work of the NITRD Subcommittee and its interagency working groups by hosting meetings, preparing annual reports to Congress, and preparing strategic plans, among other general administrative duties.[36]

Budget and Staffing

The NSTC receives no direct appropriations; rather, it uses funds provided by participating agencies to cover the operating costs of coordinating multi-agency R&D programs (such as those discussed in **Table 3**). In contrast, the R&D activities that are carried out by individual federal agencies and departments under the auspices of NSTC-coordinated initiatives are funded separately, through agency R&D budgets. This section covers NSTC's operational funding. It does not cover funding levels for multi-agency R&D programs (for a more detailed look at the organization and budget of a multi-agency R&D initiative, see CRS Report RL34401, *The National Nanotechnology Initiative: Overview, Reauthorization, and Appropriations Issues*, by John F. Sargent Jr.; for information on general federal R&D funding levels, see CRS Report R47161, *Federal Research and Development (R&D) Funding: FY2023*, coordinated by Laurie A. Harris).

Funds provided by participating agencies to cover operating costs are used to support NSTC activities that benefit multiple federal entities, such as coordination offices, studies, advisory committees, and administrative costs. The amount provided by participating agencies varies and has ranged from approximately $12 million in FY2010 to $18 million in FY2018 (the most recent year for which CRS was able to obtain total agency contributions to NSTC operations).[37]

Congress requires a number of multi-agency R&D initiatives coordinated by the NSTC to submit supplemental budgetary and program reports along with the President's annual budget request to Congress. In a 2022 report on federal R&D, GAO examined such submissions to determine NSTC operational funding levels for selected multi-agency initiatives, including NITRD, the National Nanotechnology Initiative (NNI), and U.S. Global Change Research Program (USGCRP).[38]

In FY2020, NITRD, NNI, and USGCRP each received funds from participating agencies through a "distributed cost budget" to support a National Coordination Office, or NCO, whereby agency contributions to operational funds were determined by the relative R&D spending levels of each agency participating in the multi-agency initiative (see **Table 3**).[39] NCO staff may include contract employees in addition to agency detailees.

[36] For a general description of NCO responsibilities, see ibid., p. 40.

[37] Funding totals do not include infrastructure contributions from OSTP and funding for NSTC activities that are solely within a single agency. OSTP, "FY2018 Interagency Funding for Activities of the National Science and Technology Council," provided by email from OSTP to CRS, February 14, 2020. This report is known informally as the "Pass the Hat" report.

[38] U.S. Government Accountability Office, *Federal Research and Development: Funding Has Grown Since 2012 and Is Concentrated within a Few Agencies*, GAO-23-105396, December 2022, available at https://www.gao.gov/assets/gao-23-105396.pdf.

[39] Some agencies with small budgets devoted to the multi-agency initiative have been excluded from such assessments. For NITRD NCO budget and staffing, see p. 45; for NNI NCO budget and staffing, see p. 49; and for USGCRP budget and staffing, see p. 49 of U.S. Government Accountability Office, *Federal Research and Development: Funding Has Grown Since 2012 and Is Concentrated Within a Few Agencies*, GAO-23-105396, December 2022, available at https://www.gao.gov/assets/gao-23-105396.pdf.

Table 3. Selected National Coordination Office (NCO) Budgets

FY2020

Multi-agency R&D Initiative NCO	Funding Contributions of Participating Agencies
NITRD NCO	$4.4 million
NNI NCO	$2.9 million
USGCRP NCO	$8.1 million

Source: U.S. Government Accountability Office, *Federal Research and Development: Funding Has Grown Since 2012 and Is Concentrated Within a Few Agencies*, GAO-23-105396, December 2022, available at https://www.gao.gov/assets/gao-23-105396.pdf.

President's Council of Advisors on Science and Technology

PCAST, an independent federal advisory committee established by Executive Order, serves as the President and White House's main source of advice from outside the government on science, technology, and innovation policy. PCAST's members, with expertise in science, technology, and innovation, are appointed by the President from sectors outside the federal government and charged with a two-fold mission: to advise the President on

- "matters involving science, technology, and innovation policy"; and
- "matters involving scientific and technological information that is needed to inform policy" relating to various topics (e.g., the economy, national security).[40]

Overview and Background

On January 23, 1990, President George H. W. Bush issued Executive Order 12700, which established the founding charter for PCAST and outlined the basic structure and goals of the advisory group that largely continue today.[41] Various science advisory bodies tasked with serving the President existed prior to 1990, though they differed substantially in scope and composition, and were not consistently reconstituted or used by subsequent presidential administrations.[42] By contrast, every President since PCAST's creation has reestablished PCAST, with slight differences. Some of these changes are addressed in the following section.[43]

[40] PCAST has generally been charged with serving these two advisory functions, though specific aspects of its "functions," as outlined by successive presidential administrations, have varied. See section titled "Roles and Responsibilities" for additional information. Executive Order 14007, "President's Council of Advisors on Science and Technology," 86 *Federal Register* 7615, January 27, 2021.

[41] Executive Order 12700, "President's Council of Advisors on Science and Technology," 55 *Federal Register* 2219, January 23, 1990.

[42] For more information on preceding presidential science advisory groups to the president, see Zuoyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and Cold War America* (New Brunswick, NJ: Rutgers University Press, 2008).

[43] Clinton Administration: Executive Order 12882, "President's Committee of Advisors on Science and Technology," 58 *Federal Register* 62492-62493, November 26, 2003; George W. Bush Administration: Executive Order 13226, "President's Council of Advisors on Science and Technology," 66 *Federal Register* 50523-50524, October 3, 2001; Obama Administration Executive Order 13539, "President's Council of Advisors on Science and Technology," 75

Most recently, President Biden reestablished PCAST with Executive Order 14007 on January 27, 2021, for a period of two years.[44] On September 30, 2021, President Biden issued Executive Order 14048, which extends PCAST until September 30, 2023.[45]

Organization

President Biden's PCAST, composed of 27 members, is led by three co-chairs: Arati Prabhakar (as Assistant to the President for Science and Technology) and two nonfederal representatives, Frances Arnold and Maria T. Zuber.[46] PCAST members serve without compensation but may receive travel expenses, including a per diem, as authorized by law.[47]

PCAST membership has expanded during President Biden's Administration. Per Executive Order 14044, issued on September 13, 2021, PCAST membership expanded to include "not more than 32 members" (up from "not more than 26 members" when it was originally reestablished on January 27, 2021). Under President Trump, PCAST membership included a chair and not more than 16 additional members. In keeping with the intent of its founding charter, both administrations stipulated that PCAST members should be appointed by the President and represent sectors outside the federal government.

President Biden has altered aspects of PCAST's leadership structure and composition. Executive Order 14007 stipulates that the Assistant to the President for Science and Technology (who it refers to as the "science advisor") shall be a member of PCAST and serve as a co-chair. It also allows for the Science Advisor, if also serving simultaneously as the Director of OSTP, to designate the U.S. Chief Technology Officer as a member of PCAST.[48] The executive order issued by President Trump establishing PCAST designated the OSTP Director as PCAST chair and did not reference the APST or designate co-chair positions.[49]

Under the provisions of Executive Order 14007, PCAST also serves as two statutorily created advisory committees: the President's Innovation and Technology Advisory Committee (PITAC) created by the High Performance Computing Act of 1991 (P.L. 102-194 as amended)[50] and the

Federal Register 21973-21975, April 27, 2010; Trump Administration Executive Order 13895, "President's Council of Advisors on Science and Technology," 84 *Federal Register* 57309, October 22, 2019.

[44] Executive Order 14007, "President's Council of Advisors on Science and Technology," 86 *Federal Register* 7615, January 27, 2021.

[45] Executive Order 14048, "Continuance or Reestablishment of Certain Federal Advisory Committees and Amendments to Other Executive Orders," 86 *Federal Register* 55465, September 30, 2021.

[46] As of December 2022, The White House, "President's Council of Advisors on Science and Technology," available at https://www.whitehouse.gov/pcast/members.

[47] Executive Order 14007, "President's Council of Advisors on Science and Technology," 86 *Federal Register* 7615, January 27, 2021.

[48] Ibid.

[49] Executive Order 13895, "President's Council of Advisors on Science and Technology," 84 *Federal Register* 57309, October 22, 2019.

[50] 15 U.S.C. §5511(b). In October 2005, President George W. Bush issued Executive Order 13385 designating PCAST to serve as the President's Information Technology Advisory Committee (PITAC) under subsections 101(b) and 103(b) of the High-Performance Computing Act of 1991 (P.L. 102-194), as amended (15 U.S.C. 5511(b) and 5513(b)). In April 2010, President Obama issued Executive Order 13539 which, among other things, changed the name of the advisory committee to the President's Innovation and Technology Advisory Committee (which also uses the acronym PITAC) and continues PCAST's role in fulfilling this statutory function.

National Nanotechnology Advisory Panel (NNAP) created by the 21st Century Nanotechnology Research and Development Act (P.L. 108-153 as amended).[51]

Roles and Responsibilities

PCAST's primary function is to advise the President on policies affecting science, technology, and innovation policy as well as on matters where science and technology expertise or information is needed to inform policies. The extent to which S&T expertise and information is recognized as having an important role to play in formulating public policy, the second element of PCAST's two-fold function, has varied by presidential administration.

For example, President Biden directed PCAST members to advise on "matters involving scientific and technological information that is needed to inform public policy relating to the economy, worker empowerment, education, energy, the environment, public health, national and homeland security, racial equity, and other topics."[52] President Trump directed PCAST members to provide "scientific and technical information that is needed to inform public policy relating to the American economy, the American worker, national and homeland security, and other topics."[53]

In addition to meeting regularly to respond to requests from the President or APST, PCAST is also charged with soliciting information and ideas from stakeholders "including the research community; the private sector; universities; national laboratories; State, local and Tribal governments; foundations; and nonprofit organizations." PCAST is also charged with providing nonfederal sector advice to the NSTC, as requested.[54]

Budget and Staffing

PCAST receives no direct appropriations. Rather, the Department of Energy provides funding as well as administrative and technical support for PCAST from existing appropriations through the DOE Science account.[55] DOE support for PCAST has generally included one to two FTEs per year with funding ranging from $654,000 in FY2014 to $366,000 in FY2022 for salaries and benefits, committee member travel, meeting planning support, and related expenses. The President requested $750,000 and two FTEs for FY2023.[56]

[51] 15 U.S.C. §7503.

[52] Ibid.

[53] Executive Order 13895, "President's Council of Advisors on Science and Technology," 84 *Federal Register* 57309, October 22, 2019.

[54] Executive Order 14007, "President's Council of Advisors on Science and Technology," 86 *Federal Register* 7615, January 27, 2021.

[55] Executive Order 14007, "President's Council of Advisors on Science and Technology," 86 *Federal Register* 7615, January 27, 2021.

[56] Communication between CRS and Department of Energy Office of Congressional and Intergovernmental Affairs on January 20, 2023.

Issues for Congress

In exercising OSTP oversight, Congress may wish to consider a number of issues, including staffing practices and potential conflict of interest concerns; workplace culture and past congressional oversight activity; the efficacy of federal S&T coordination; and persistent vacancies of Senate-confirmed leadership positions.

IPAs, Fellows, and Potential Conflicts of Interest at OSTP

The ability of OSTP to perform its statutory duties depends, in part, on the size of its budget and staff. To increase staff levels beyond what is funded through congressional appropriations, OSTP has long relied on detailees, IPAs, and fellows. Though OSTP has not released the exact number of detailees, IPAs, and fellows currently employed during the Biden Administration, CRS analysis of available staffing information suggests that OSTP's reliance on such positions is comparable to previous administrations. For example, during the Trump and G.W. Bush Administrations, detailees, IPAs, and fellows comprised more than half of OSTP's total staff, and during the Clinton and Obama Administrations, they accounted for approximately two-thirds of total staff.[57]

Some in the S&T community have expressed concerns that OSTP needs to have more career civil service professional staff and a larger budget.[58] In their view, additional career staff, who would continue to serve from one presidential Administration to the next, would help maintain institutional knowledge and provide a solid understanding of government operations. More career staff might also enable a new Administration to move more quickly on S&T policy issues and provide enhanced support to political appointees during presidential transitions. Reports expressing these views assert that this change would make OSTP staff similar to other EOP expert staff, such as those employed at OMB.[59]

In the absence of a larger civil service staff, OSTP relies heavily on detailees, IPAs, and fellows. The Tech Transparency Project, a nonprofit watchdog organization, has raised concerns over the influence that fellows and IPAs working at OSTP may have on the direction of national S&T policy priorities.[60] They assert that the nongovernmental sources of funding that support the salaries of fellows and IPAs may pose conflict of interest concerns. For example, former Google CEO Eric Schmidt has reportedly contributed money through the Federation of American Scientists (FAS) to support the salaries of "more than two dozen officials in the Biden administration."[61] Politico reported that two individuals' salaries were "indirectly paid" with

[57] Email communication from OSTP to CRS, July 27, 2017.

[58] 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), 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).

[59] According to the FY2023 budget request, OMB supported 469 full time equivalent staff in 2021, an estimated 451 FTEs in 2022, and an estimated 516 FTEs in 2023. For more information, see OMB, *Budget of the U.S. Government: Fiscal Year 2023,* available at https://www.whitehouse.gov/wp-content/uploads/2022/03/budget_fy2023.pdf.

[60] Tech Transparency Project, "Eric Schmidt's Expanding Influence Apparatus," December 20, 2022, available at https://www.techtransparencyproject.org/articles/eric-schmidts-expanding-influence-apparatus.

[61] Alex Thompson, "Ex-Google Boss Helps Fund Dozens of Jobs in Biden's Administration," *Politico,* December 22, 2022, available at https://www.politico.com/news/2022/12/22/eric-schmidt-joe-biden-administration-00074160.

Schmidt funds while at OSTP, including the chief of staff for a six week period.[62] The Technology Transparency project has argued that Schmidt's alleged financial contributions to their salaries may pose a significant conflict of interest given that, while employed at OSTP, they may be in positions to shape policy priorities in areas where Schmidt holds a financial interest.[63]

On January 10, 2023, Senator Grassley sent a letter to OSTP Director Arati Prabhakar citing concerns over potential conflicts of interest stemming from IPA appointments at OSTP.[64] The letter was one of 10 sent to agencies across the federal government requesting information about their use of the IPA Mobility Program.[65] "Full public transparency is critical to ensuring that the roles, responsibilities, and funding arrangements for IPA assignees at OSTP whose salaries are funded by the FAS do not present potential or actual conflicts of interest," the letter stated. Pointing to guidance from the Office of Personnel Management (OPM) requiring federal agencies to document the terms and justify the value of IPA appointments, Senator Grassley requested such records and a list of additional details pertaining to OSTP's use of IPA appointments by January 24, 2023. As of February 6, 2023, Senator Grassley's office has not received the requested information from OSTP.[66]

Though some have raised ethical questions regarding the ability for outside groups to use IPA appointments to influence federal policymaking, some contend that IPA positions serve a vital function. In a January 2022 report evaluating federal agency use of the Personnel Mobility Program (which implements IPA appointments), GAO found that the program functioned as an important mechanism by which to address agency "skills gaps in highly technical or complex mission areas."[67] Despite affirming that the program "holds promise as a tool" for agencies to address skills gaps, GAO concluded that additional data on program use as well as increased program oversight may be warranted.[68]

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[62] Alex Thompson, "A Google Billionaire's Fingerprints Are All Over Biden's Science Office," *Politico*, March 28, 2022, available at https://www.politico.com/news/2022/03/28/google-billionaire-joe-biden-science-office-00020712.

[63] OSTP's former general counsel raised such concerns in internal emails obtained by Politico as cited in ibid.; a Brookings Institution fellow claims Schmidt is attempting to influence AI policy in Alex Thompson, "Ex-Google Boss Helps Fund Dozens of Jobs in Biden's Administration," *Politico*, December 22, 2022; and Tech Transparency Project, "Eric Schmidt's Expanding Influence Apparatus," December 20, 2022, available at https://www.techtransparencyproject.org/articles/eric-schmidts-expanding-influence-apparatus.

[64] Letter from Charles E. Grassley, U.S. Senator, to Hon. Arati Prabhakar, Director, Office of Science and Technology Policy, January 10, 2023, available at https://www.grassley.senate.gov/imo/media/doc/grassley_to_office_of_science_and_technology_policy_-_ipa_oversight.pdf.

[65] Office of Senator Chuck Grassley, "Grassley Launches Sweeping Review of Program Allowing Privately Employed Individuals to Serve in Federal Government Roles," press release, January 10, 2023, https://www.grassley.senate.gov/news/news-releases/grassley-launches-sweeping-review-of-program-allowing-privately-employed-individuals-to-serve-in-federal-government-roles.

[66] Email communication from OSTP to CRS, February 6, 2023. Letter from Charles E. Grassley, U.S. Senator, to Hon. Arati Prabhakar, Director, Office of Science and Technology Policy, January 10, 2023, available at https://www.grassley.senate.gov/imo/media/doc/grassley_to_office_of_science_and_technology_policy_-_ipa_oversight.pdf.

[67] U.S. Government Accountability Office (GAO), *Personnel Mobility Program: Improved Guidance Could Help Federal Agencies Address Skills Gaps and Maximize Other Benefits*, GAO-22-104414, January 2022, available https://www.gao.gov/assets/gao-22-104414.pdf.

[68] Ibid., p. 28.

OSTP Workplace Culture and Congressional Oversight

In early 2022, allegations surfaced that Eric Lander, then OSTP Director and President Biden's APST, had bullied and verbally abused members of his staff. On February 7, 2022, Politico reported that a White House internal investigation had found "credible evidence" that the allegations were true.[69] The same day, the Chairwoman and Ranking Member of the House Committee on Science, Space, and Technology sent a joint letter to President Biden requesting a copy of the internal White House report and OSTP's intended next steps to "improve the workplace environment."[70] On February 8, 2022, the White House announced Lander's resignation.[71] Subsequently, President Biden tasked Alondra Nelson (then Deputy Director for Science and Society) with serving as Acting OSTP Director and Francis Collins (a former Director of the National Institutes of Health) with the temporary duties of APST and PCAST co-chair.[72]

In March 2022, some Members of the U.S. House of Representatives sent subsequent oversight letters to Nelson and President Biden's Counsel questioning why Lander was not asked to resign more promptly after allegations about his behavior were received.[73] The letters charged OSTP with attempting to subvert congressional oversight by refusing to disclose certain records and by reportedly using and encouraging other OSTP staff to use the Signal Private Messenger application, a communication technology "that is often intended to skirt federal records laws and prevent oversight by Congress."[74] Congress may wish to conduct further oversight over OSTP's use of such communication methods as well as oversight pertaining to the effectiveness of OSTP's efforts to prevent workplace harassment.

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[69] Alex Thompson, "Biden's Top Science Adviser Bullied and Demeaned Subordinates, According to White House Investigation," *Politico*, February 7, 2022, available at https://www.politico.com/news/2022/02/07/eric-lander-white-house-investigation-00006077.

[70] Letter from Eddie Bernice Johnson, Chairwoman, Committee on Science, Space, and Technology, and Frank Lucas, Ranking Member, Committee on Science, Space, and Technology, to President Joseph R. Biden, Jr., February 7, 2022, available at https://republicans-science.house.gov/_cache/files/0/2/024128de-d87d-4ad6-8e3e-3b377cc1d571/5E58706F9D351315894E017D3547DE59.2022-02-07-biden-ostp-ebj-lucas.pdf.

[71] White House, "Press Briefing by Press Secretary Jen Psaki, February 8, 2022," press release, February 8, 2022, available at https://www.whitehouse.gov/briefing-room/press-briefings/2022/02/08/press-briefing-by-press-secretary-jen-psaki-february-8-2022/.

[72] After her Senate confirmation on September 22, 2022, Arati Prabhakar assumed the duties of OSTP Director, APST, and PCAST Co-Chair. Alondra Nelson resumed her position as Deputy Director for Science and Society. See the White House, "President Biden Announces OSTP Leadership," press release, February 16, 2022, available at https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/16/president-biden-announces-ostp-leadership/.

[73] Letter from James Comer, Ranking Member, Committee on Oversight and Reform; Frank Lucas, Ranking Member, Committee on Science, Space and Technology; and Ralph Norman, Ranking Member, Subcommittee on Environment, to Dana Remus, Counsel to the President, March 10, 2022, available at https://republicans-science.house.gov/_cache/files/b/8/b8eb805e-de97-485e-bc40-0ef7f1097d9a/F493654715E53FC7F1D3C85277E09128.2022-03-10-ostp-follow-up.pdf.

[74] Letter from James Comer, Ranking Member, Committee on Oversight and Reform; Frank Lucas, Ranking Member, Committee on Science, Space and Technology; and Ralph Norman, Ranking Member, Subcommittee on Environment, to Alondra Nelson, Deputy Director of Science and Society Performing the Duties of Director, Office of Science and Technology Policy, March 3, 2022, available at https://republicans-science.house.gov/_cache/files/2/a/2a9957ca-cb14-4878-8a37-1cfb65ec0005/8B5B2F4AE270228EF29C63E60673FBD0.03-03-2022-comer-norman-fdl—ostp-lander-allegations.pdf.

Interagency S&T Coordination

OSTP, through the work of its six policy teams as well as the NSTC, plays a key role in coordinating federal R&D activities as well as establishing and ensuring the implementation of national S&T priorities across federal agencies. In addition to the priority-setting that takes place in partnership with OMB throughout the annual budget process, OSTP may also exercise its coordination duties through oversight of the development and implementation of interagency S&T policies and strategic initiatives.

From 2013 to 2021, the Government Accountability Office (GAO) issued a series of reports that evaluated various aspects of OSTP's S&T coordination duties and issued a number of recommendations designed to improve such efforts, as well as OSTP's ability to track and monitor agency progress toward national goals.[75]

In a July 2022 letter to then-Acting OSTP Director Alondra Nelson, GAO highlighted three open priority recommendations which it had made to OSTP in July 2021 related to strengthening interagency coordination. GAO urged OSTP to more effectively use the committees and subcommittees of the NSTC to sustain coordination of national research and development priorities and develop mechanisms to track and evaluate interagency progress toward addressing cross-cutting S&T issues.

At the same time, OSTP's coordination and assessment duties have continued to expand. Enacted in August 2022, the CHIPS and Science Act (P.L. 117-167) includes provisions directing OSTP to develop, issue, and oversee implementation of uniform S&T policies across federal research agencies in a number of areas, such as research security and broadening participation in science. The act also requires the Director of OSTP to develop and submit to Congress (no later than December 31 of the calendar year after a review of the most recent national security strategy report has been completed) a four-year comprehensive national S&T strategy, primarily focused on economic security. The report is to be coordinated with other federal strategies (e.g., the national defense strategy).[76]

OSTP's Senate-Confirmed Leadership Positions

The degree to which Congress may exercise oversight and policy direction at OSTP may be affected by whether a presidential administration chooses to nominate OSTP leadership positions that require Senate confirmation.

Current statutory authority provides flexibility to the President with respect to the number of OSTP Associate Directors (up to four, each subject to Senate confirmation) and the scope of their areas of responsibility (entirely at the discretion of the President).[77] President Biden currently has no confirmed OSTP Associate Directors, but has established Deputy Director positions (which do not require Senate confirmation) to lead OSTP's six policy teams. President Trump had one Senate-confirmed Associate Director, and three unconfirmed Principal Assistant Director positions. President Obama established four Senate-confirmed Associate Directors and President George W. Bush established two. Congress may wish to consider whether amending current statute to specify certain areas of responsibility for Associate Directors or those acting in their place might provide additional oversight opportunities.

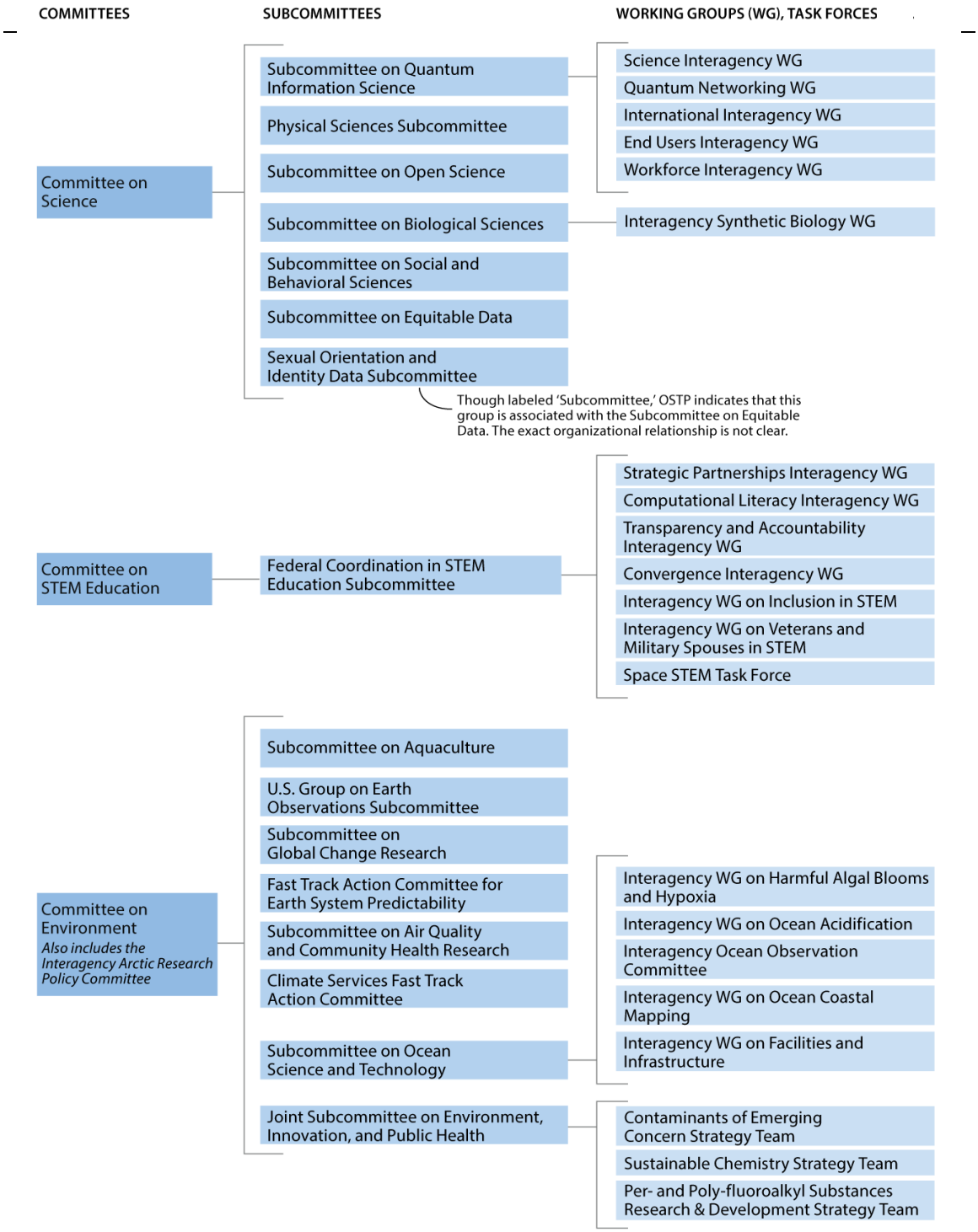
[75] GAO reports cited in a Letter from Gene L. Dodaro, Comptroller General, to Alondra Nelson, Acting Director, Office of Science and Technology Policy, July 22, 2022, available at https://www.gao.gov/assets/gao-22-105916.pdf.

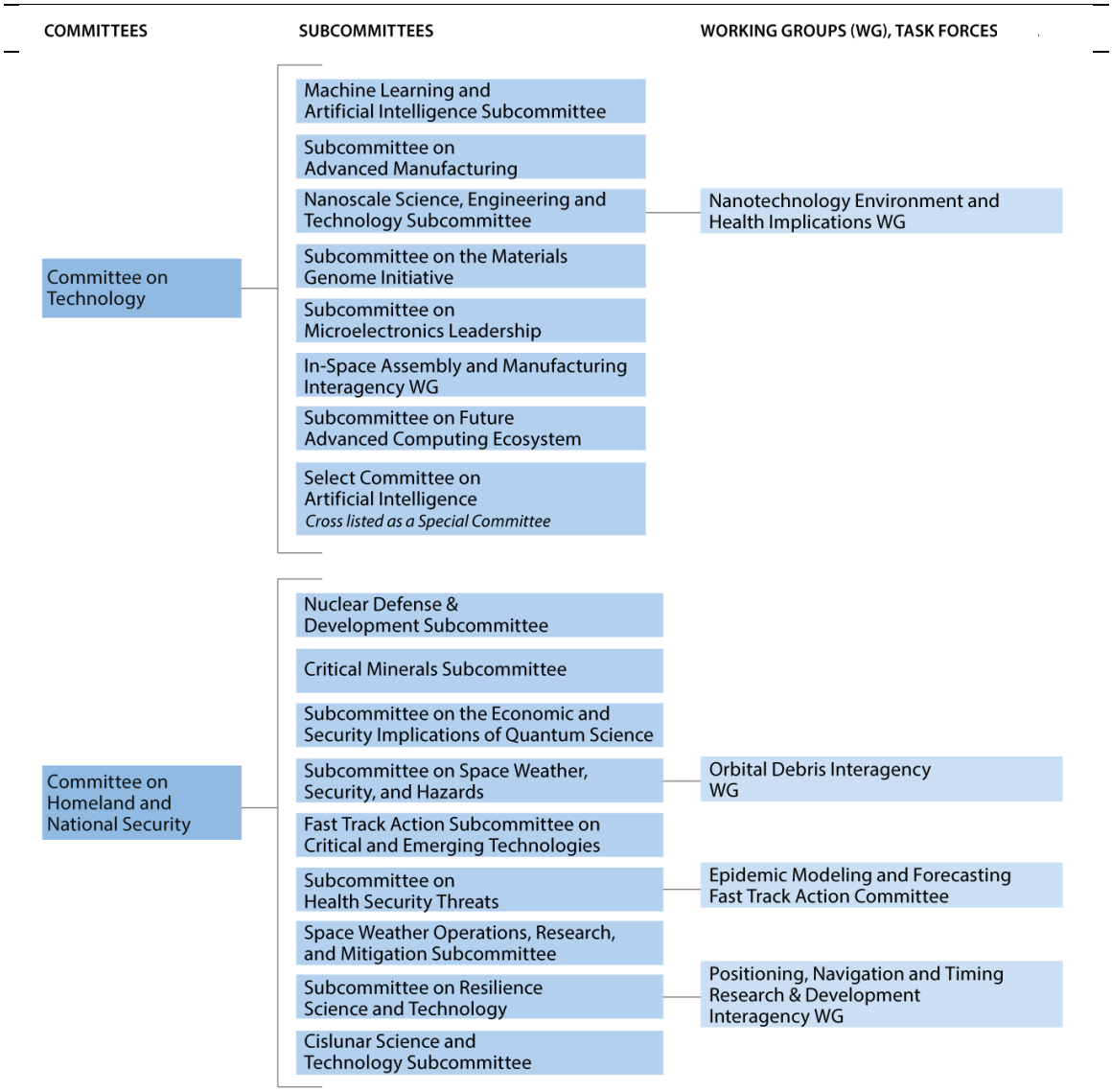
[76] §6615 and §6615b, P.L. 117-167.

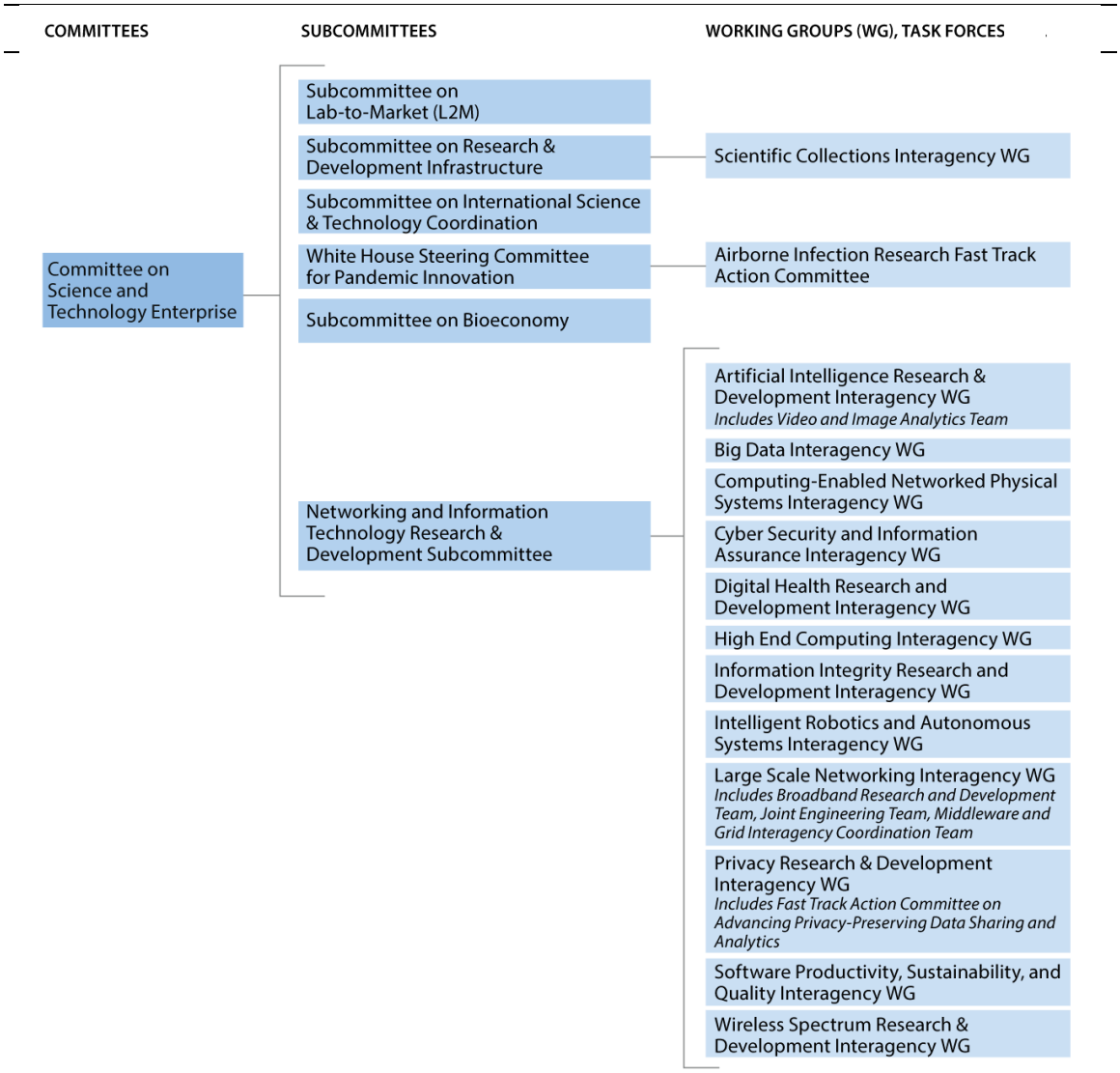
[77] 42 U.S.C. §6612.

Appendix A. National Science and Technology Council Organization

Committees, Subcommittees, Working Groups, Task Forces

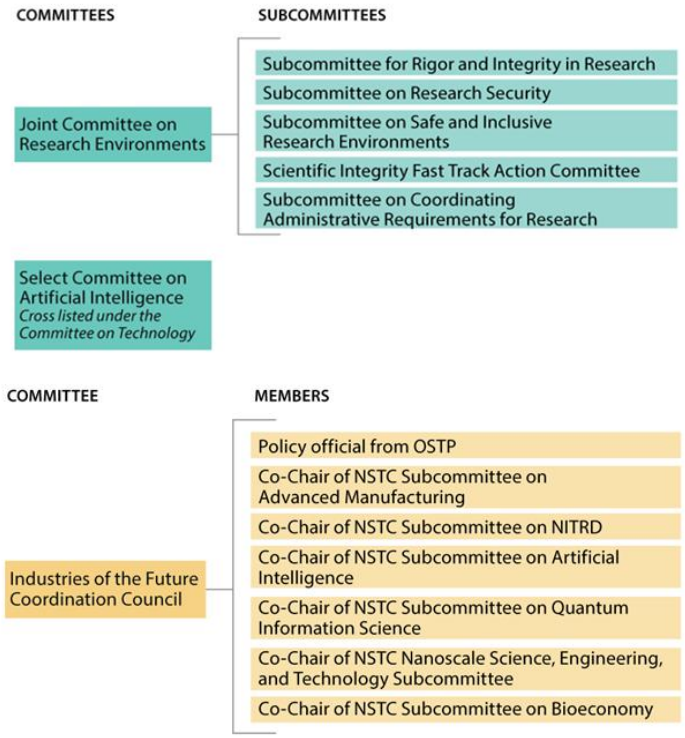



COMMITTEES
SUBCOMMITTEES
WORKING GROUPS (WG), TASK FORCES
Committee on Technology
Machine Learning and Artificial Intelligence Subcommittee
Subcommittee on Advanced Manufacturing
Nanoscale Science, Engineering and Technology Subcommittee
Nanotechnology Environment and Health Implications WG
Subcommittee on the Materials Genome Initiative
Subcommittee on Microelectronics Leadership
In-Space Assembly and Manufacturing Interagency WG
Subcommittee on Future Advanced Computing Ecosystem
Select Committee on Artificial Intelligence
Cross listed as a Special Committee
Committee on Homeland and National Security
Nuclear Defense & Development Subcommittee
Critical Minerals Subcommittee
Subcommittee on the Economic and Security Implications of Quantum Science
Subcommittee on Space Weather, Security, and Hazards
Orbital Debris Interagency WG
Fast Track Action Subcommittee on Critical and Emerging Technologies
Subcommittee on Health Security Threats
Epidemic Modeling and Forecasting Fast Track Action Committee
Space Weather Operations, Research, and Mitigation Subcommittee
Subcommittee on Resilience Science and Technology
Positioning, Navigation and Timing Research & Development Interagency WG
Cislunar Science and Technology Subcommittee



Source: As of December 2022. Information from NSTC organization chart provided to CRS by OSTP via email communication on October 28, 2022. CRS graphic.

Appendix B. NSTC Special Committees



Source: Information from NSTC organization chart provided to CRS by OSTP via email communication on November 28, 2022. CRS graphic.

Note: Industries of the Future Coordination Council was created by P.L. 116-283, Division H, Title XCIV, §9412; the sunset clause mandates its termination on January 1, 2027.

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