Science in its Rightful Place:
Science, Technology, & Innovation Policy in the Obama Administration

John P. Holdren

Science and Technology Advisor to the President
Director, White House Office of Science and Technology Policy
Co-Chair, President's Council of Advisors on Science and Technology

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The new President's pledge in 2009

"We will restore science to its rightful place…"

Barack Obama, January 20, 2009

(Here "science" was short for "science, technology, & innovation— ST&I)

What he's done to keep the pledge

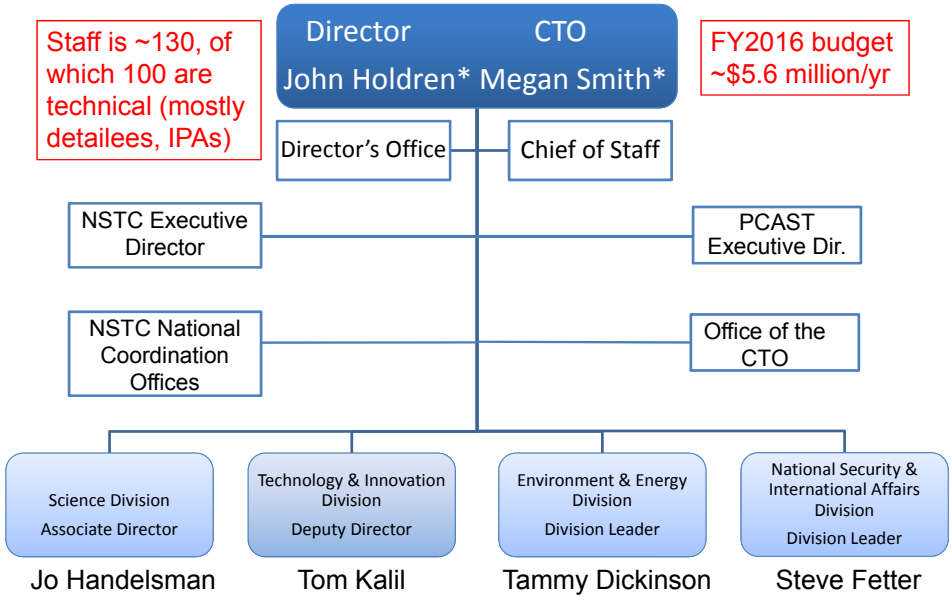
- Placed early priority on…
  - scientific integrity
  - STEM education & inclusion
  - open data & public access
  - tech innovation for economic recovery & growth
  - energy & climate change
  - advancing biomedicine & public health
  - strengthening international cooperation in S&T
  - rebalancing NASA to boost science, advanced tech
  - exploiting modern IT and private-sector innovation talent to improve the responsiveness & effectiveness of gov't

Keeping the pledge (continued)

- Put a huge boost for ST&I in the Recovery Act, then fought for ST&I budgets despite tight constraints
- To help implement it all, rebuilt White House leadership in ST&I
  - Created new WH positions: CTO, CIO, CDS, CDO
  - Created a WH Office of Energy and Climate
  - Restored OSTP Director's dual hat as AP for S&T
  - Restored Environment and National Security & International Affairs to status as full OSTP divisions
  - Revitalized President's Council of Advisors on S&T (PCAST) and National S&T Council (NSTC)
  - Built up the OSTP staff to match

OSTP today

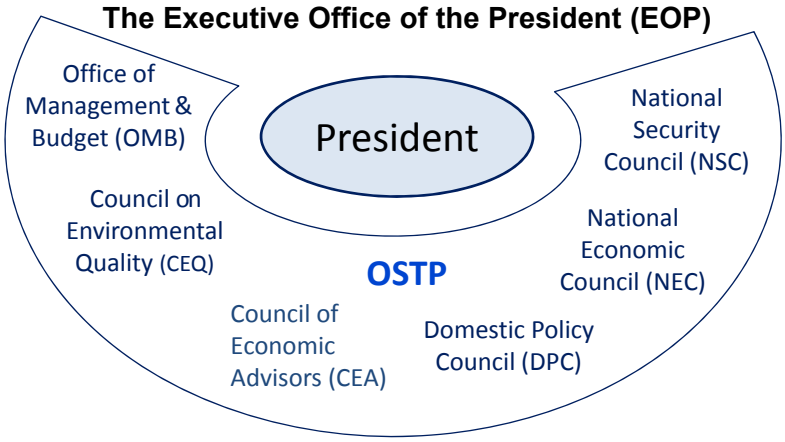
Staff is ~130, of which 100 are technical (mostly detailees, IPAs)



FY2016 budget ~$5.6 million/yr

*Both Director Holdren and CTO Smith have the rank of Assistant to the President

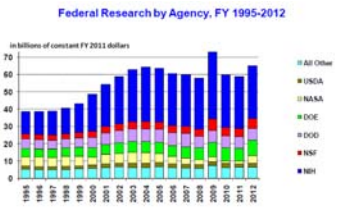
OSTP interacts closely with other White House components with ST&I interests



EOP also includes Offices of: Vice President, Chief of Staff, Cabinet Affairs, Communications, Intergovernmental Relations, Public Engagement, Social Secretary, US Trade Representative, Energy & Climate Change, and more.

OSTP: two major responsibilities

1. Policy for ST&I



Analysis, recommendations, and coordination with OMB and other White House offices on R&D budgets & related policies, S&T education and workforce issues, interagency ST&I initiatives, broadband, open government, scientific integrity ...

2. ST&I for policy

Independent advice for the President about ST&I germane to all policy issues with which he is concerned

OSTP's specific responsibilities also include…

- providing White House oversight for NSF and NASA;
- chairing and managing the interagency National Science & Technology Council (NSTC);
- providing administrative and analytical support for the President's Council of Advisors on Science & Technology (PCAST);
- carrying out a range of functions in support of National Security and Emergency Preparedness Communications; and
- coordinating & overseeing US cooperation in S&T with other countries.

OSTP-managed entities (continued)

- National Ocean Council (NOC, jointly with CEQ)
  - Implements the National Policy on Oceans, Coasts, Great Lakes
- Interagency Task Force on Climate Preparedness & Resilience (jointly with NSC, CEQ, OMB)
  - Implements P&R aspects of the President's Climate Action Plan
- Arctic Executive Steering Committee
  - Executes the 2015 Arctic-activities-coordination strategy
- Six ministerial-level Joint Commissions on S&T Cooperation (with support from State Department)
  - Brazil, China, India, Japan, Korea, Russia
- US-China Dialogue on Innovation Policy
  - Addresses challenges in IP, discrimination v. foreign firms

OSTP-managed entities (continued)

- President's Council of Advisors on Science and Technology (PCAST)
  - A PCAST or its equivalent has existed under every U.S. President since Eisenhower.
  - The current PCAST has 19 members, of whom 18, including one Co-Chair, are part-time, uncompensated Special Government Employees, appointed by the President.
  - The 19th member and other Co-Chair is the Assistant to the President for S&T / OSTP Director.
  - PCAST's function is to provide an additional high-caliber source of S&T advice for the President and to help connect him with the outside S&T community.
  - Administrative support for PCAST is provided by an Executive Director and two deputies housed in OSTP.

The members of the 2nd-term Obama PCAST

PCAST studies in the Obama Administration, 2009-2016

Biomedicine & Public Health

- The science and technology of 2009-H1N1 influenza
- Reengineering the influenza vaccine production enterprise
- Realizing the full potential of health IT to improve healthcare
- Accelerating drug development and approval
- Combating antibiotic resistance
- Technologies to assist with hearing
- Technologies for graceful aging
- S&T for safe drinking water [Fall 2016]

Energy, Resources, & Environment

- Accelerating the pace of change in energy technologies
- Sustaining biodiversity and other environmental capital
- Agricultural preparedness and related R&D
- Options for climate-change mitigation & resilience (2 reports)

PCAST studies 2009-2016 (continued)

National and Homeland Security

- Bolstering cybersecurity (classified & unclassified reports)
- Biothreat preparedness (with classified appendix) [Fall 2016]

STEM Education

- K-12 STEM education
- Strengthening STEM teaching in the first two college years
- IT for college education & workforce training (2 reports)

Technology for the Economy

- Advanced manufacturing (3 reports)
- Managing government-owned spectrum for economic growth
- Technological aspects of big data and privacy
- Networking and Information Technology R&D (3 reports)
- The National Nanotechnology Initiative (3 reports)

Miscellaneous

- The future of the US S&T enterprise
- Rethinking cities
- Forensic science in the criminal courts [Fall 2016]

President Obama has embraced a large fraction of PCAST's recommendations.

Implementation of PCAST studies

PCAST recommendations embodied in the 2010-2016 budgets:

- Prepare an additional 100,000 K-12 STEM teachers by the end of the decade; launch a STEM Master Teacher Corps
- Launch a new Advanced Research Projects Agency – Education
- Initiate improvements to influenza-vaccine manufacturing to shorten production timeframe
- Conduct DOE Quadrennial Technology Reviews to assess energy options; conduct interagency Quadrennial Energy Reviews
- Accelerate adoption of Electronic Health Records; develop standards for health-information exchange over the internet
- Expand research to foster the next revolution in IT, to help transform healthcare, energy efficiency, education, and transportation
- Launch a network of advanced-manufacturing centers
- Require increased clearing and sharing of electromagnetic spectrum held by Federal agencies to create more commercial opportunity
- Launch 3 new multidisciplinary research institutes for agriculture
- Increase collaboration with the private sector on climate resilience

Keeping the pledge (continued)

- Recruited top ST&I talent to POTUS-appointed posts
  - 5 Nobel Laureates in science; another 25+ members of National Academies; VPs of NAS & NAE to PCAST, plus Schmidt, Mundie
  - scientists & engineers heading Dept's of Energy & Interior, as well as EPA and NIH, NSF, NOAA, NIST, USGS
- Used bully pulpit & WH venue to promote ST&I
  - Both inaugural addresses & every State of the Union, two addresses to NAS annual meetings; multiple major speeches on ST&I around the country (on space, energy, manufacturing…)
  - 6 White House Science Fairs, 2 WH Astronomy Nights for Kids, East Wing ceremonies & Oval Office welcomes for Medalists of Science and Technology & Innovation, US Nobelists & Kavli Prize winners, Intel finalists, middle-school mathletes, outstanding teachers…
- Launched unprecedented number of ST&I initiatives focused on national & global challenges

POTUS events around STEM-ed and ST&I

1st WH Astronomy Night for Kids

Mathletes in the Oval Office

1st WH Science Fair

Honoring outstanding K-12 science teachers

Visiting MIT's Energy Lab

Initiatives on nat'l & global challenges

STEM EDUCATION
- Educate to Innovate
- STEM Master Teacher Corps
- 100kin10
- STEM Inclusion Initiative
- Computer Science for All

INFOTECH / COMPUTING
- ConnectED
- Big Data Initiative
- Nat'l Strategic Computing Initiative

INNOVATION FOR THE ECONOMY
- American Innovation Strategy
- Startup America
- Data.gov
- Challenge.gov
- Advanced Mfg Partnership / Nat'l Network for Mfg Innovation

BIOMEDICINE & HEALTH
- Neuroscience / BRAIN Initiative
- Combating Antimicrobial Resistance
- Precision Medicine Initiative (PMI)
- Cancer Moonshot

ENERGY & ENVIRONMENT
- New fuel-economy/CO_2 standards
- ARPA-E, Energy Innovation Hubs
- National Ocean Policy
- Arctic Initiative / AESC
- Pollinator Initiative
- Climate Action Plan & COP21

NAT'L SECURITY / INTERNAT'L S&T
- Cybersecurity Initiative
- Space Weather Strategy
- Science Envoys
- Mission Innovation

The unfinished ST&I agenda: a partial list

- Ensuring sufficient, safe, secure, sustainable, affordable food, water, & energy for all, while reducing GHGs
- Minimizing harm from changes in climate that are no longer avoidable
- Fashioning materials from abundant elements to substitute for current uses of scarce ones
- Understanding the brain & curing its ailments
- Controlling infectious & vector-borne diseases
- Defeating cancer
- Facilitating graceful aging
- Defending the planet from killer asteroids
- Sending humans into space not just to visit but to stay

Some persistent obstacles

- Inadequate funding for R&D (public & private)
- Slow translation of R&D advances into practical applications
- Under-representation of females & ethnic minorities in STEM fields
- Under-representation of ST&I talent in many Federal departments, agencies, and offices
- Poor public & policy-maker understanding of ST&I
  - the role of ST&I in meet societal challenges
  - the importance of basic research
  - the value of international cooperation

Some big opportunities on the path ahead

- Harness the full potential of partnerships (local/ state/federal, public/private/academic/civil-society, international) to overcome many of the obstacles.
- Continue the "infiltration" across the gov't of ST&I talent by aggressive recruiting, PIFs, AAAS fellows, etc.
- Apply research on "what works" in STEM inspiration, teaching, mentoring, training to increase participation in STEM careers and create a science-savvy citizenry.
- Exploit recent advances in biomedical sciences & "big data" to drastically improve healthcare.
- Build on the momentum of COP21 and the recent rapid growth of renewable-energy deployments worldwide to fashion a global revolution in clean energy.

http://www.ostp.gov