

Center for the Study of the Presidency



Issue Papers For the New Administration

#2 “Advancing Innovation: Improving the Science Advisory Structure and Policy Process”

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“There is an absolute need for better integration, coordination and communication at all levels within the White House, within the Executive Branch, and between the White House and Congress, and within the science and technology community when formulating research and innovation policy. There also needs to be better anticipatory capability in all units. Fortunately, a very strong base for bipartisan action on science policy exists in the Congress. Almost no other issue enjoys this support.”

In **Report to the President-Elect 2000: Triumphs and Tragedies of the Modern Presidency**, the Center analyzed Presidential leadership through the lens of more than seventy-six case studies. These **Issue Papers** are a forward looking complimentary series of short, single-author papers that frame and briefly analyze key issues that the next President must address during the early months of his Administration. Views expressed in these papers are those of the authors.



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Advancing Innovation: Emerging Themes

A. The R&D Policymaking Environment Has Changed Significantly

1. National and global events are changing the way federal policy is made (Watkins, Rooney, Branscomb, Carnes):

- The end of the Cold War and “the end of more than two decades of structural deficits in the federal government means that two powerful political drivers of science and technology policy have disappeared.” (Rooney, Watkins)
- “During the Cold War the U.S. government focused on strengthening its own technical capabilities and those of defense firms dedicated to development and production for government. Today, officials are asking how can government empower the private sector.” (Branscomb)
- The federal government is “weak both in policy research and analytic capability.... We haven’t been able to build infrastructures, mechanisms and institutions inside the government” to create “a business environment where technical innovations can flourish.” (Carnes)

2. The private sector now dominates research and development (R&D) investment, especially commercial development in key sectors (Branscomb, Rooney):

- The private sector invests three dollars in R&D for every federal dollar. (Teich, Rooney)
- “The Feds paid 90 percent of the cost of the federal highway system. Now we are building an intellectual highway system and the federal government is going to contribute two percent.” (Branscomb)
- Our thinking should be “more strategic and longer term.” As the economy becomes more technologically intensive, federal investment probably needs to grow as a fraction of the economy” and “a larger fraction of federally funded research should be long-term.” (Branscomb)

B. “The Fundamental Principles of Federalism are Being Tested.”

1. Governance structures are not keeping pace with innovation and the need for long-range research (Carnes, Neal, Watkins, Branscomb):

- “The fundamental principles of federalism are being tested.... Internet taxation is a good example.... [The lines of authority are so blurred that] 18 different federal agencies think they have some role to play in developing policy for e-commerce.” (Carnes)

- Most Administrations last four years, whereas major scientific projects may take 10 years. “We have hit a [planning and budget] ceiling...that limits our science.” (Neal)

2. The Congressional budget process is fractured.

- All nine agencies that participate in the 1996 National Oceanographic Partnership Act “must now go before 43 committees in the House and Senate to win authorization and appropriations approval...These new relations need to be addressed because we are doing business in a new way.” (Watkins)

C. Our Science Advisory Structures, Policy Processes and Long-Range Vision are Flawed

1. Presidents tend to view science policy as “important” but not “urgent.” (Yochelson)

- “Decisions about science and technology don’t naturally flow in and out of the Oval Office.” In fact “the whole process is very episodic...and linked to other issues.” (Yochelson)

2. Recent Presidents have not always been well served by their coordinating bodies.

- The National Science and Technology Council “has performed erratically” (Nichols), and its predecessor, the Federal Coordinating Council for Science, Engineering and Technology, lacked political clout unless “Cabinet members and independent agency heads” actively participated. (Bromley)
- “Making the President the chairman [of the White House coordinating body]...is a great idea. But it only works if the President shows up and participates.” (Bromley)

3. “Senators Barbara Mikulski and Kit Bond recently said that federal science policy lacks vision, and I think they are right. We can do better.” (Branscomb)

D. Presidential Action Is Needed to Make Innovation a National Priority

1. Science and technology policy is vital to our nation’s economy, quality of life and national security:

- “The federal government is the monopoly financier of new knowledge creation in our society.” (Rooney).
- “Much of the university-based physical engineering, science and mathematics depends on the Department of Defense (DOD).” This research, and work done for the Defense’s Advanced Research Projects Agency (DARPA), should be viewed as “part of the overall S&T apparatus” in support of both national security and innovation capacity. (Nichols)
- The federal government forms important partnerships with industry and foreign governments. (Weiss, Bond, Branscomb)

2. “The pathetic thing is that we have a plethora of reports on how to fix these important issues, and we still haven’t made the necessary changes!” (Watkins)

- “A very strong base for bipartisan action on science policy exists in the Congress. Almost no other issue enjoys this” support. (Watkins)
- The President, as Commander-in-Chief, must “re-establish the link between innovation policy and national security.” (Abshire) Doing so would elevate science policy. (Yochelson)

E. The President Should Strengthen Core Elements of the Current Advisory Structure

1. Assistant to the President for Science and Technology:

- “To be effective, you will need to elevate the science advisor so that the important is not crowded out by the urgent.” (Yochelson, Abshire)
- Early appointment of the science advisor is critical. (Branscomb, Nichols, Bromley, Teich)
- So is Capitol Hill credibility (Wells, Yochelson), but perhaps most important is “the personal relationship between the advisor and the President.” (Bromley, Yochelson)
- The science advisor should help set priorities, craft the R&D budget and work with Congress. (Watkins, Bromley, Branscomb, Yochelson)
- The science advisor should “go around with the President and the Office of Management and Budget (OMB) director and talk to members of Congress” about priorities, budgets, and the possibility of creating “a joint committee session” so that “everyone really knows” the importance of long-range research and innovation. (Watkins)

2. The Office of Science and Technology Policy:

- As director of OSTP, the science advisor should add a chief of staff and “double hat” associate directors to appropriate OMB elements so that OSTP can more effectively command resources. (Watkins)
- The number of OSTP professional staff should be increased so that the director and staff can better handle “all of the regulatory, fiscal, legal and business environment policies that impact the innovation process.” (Carnes, Nichols)
- Although the Office of Management and Budget traditionally has taken the lead in interagency activities, “I would ensure very strong OSTP interactions with the Security Council, the Economic Council, the Domestic Policy Council, Council on Environmental Quality and the Office of the U.S. Trade Representative, among others.” (Nichols)

3. The President’s Committee of Advisors for Science and Technology:

- PCAST also “needs to be elevated...and better staffed” (Nichols) because industry “has to gain greater visibility” with the President on key policy issues. (Watkins)

- The President should task PCAST members with a select few major national issues to which they can make a significant contribution. (Bromley, Wells)
- However, “you can’t stick inside the White House an advocacy group for one small segment. Their role is to help the President with science for policy, not to promote the interests of science.” (Bromley, Teich)
- One way to avoid advocacy is to appoint PCAST members to other “interconnected advisory groups.” (Watkins)

F. The President Should Create an Integrated Interagency Advisory Structure that Directly Links Research and Innovation to National Goals

1. This body would create “greater anticipatory capacity” and help establish long-range research priorities: (Watkins, Branscomb, Nichols)
 - “There is an absolute need for better integration, coordination and communication at all levels within the White House, within the Executive Branch, between the White House and Congress, and within the S&T community.” (Watkins)
 - “The National Economic Council (NEC) needs not only to propose economic policies to the President, but to examine as well the impact of economic policies on our innovative economy. Neither OSTP nor NEC alone can do it.” (Branscomb, Carnes)
 - “To manage the multiplicity of committees on the Hill and in the agencies,” the President might propose a process “outside the normal appropriations process” that looks closely “at the federal government’s entire R&D portfolio,” in the context of what industry and other countries are doing. (Carnes)
2. The President, science advisor and Secretary of Defense should consider strengthening the Defense Science Board, so that it can better help set military R&D priorities. (Nichols)

G. The Federal Government Should Set Creative, Long-Term Research Goals

1. Our research goal should be “to work at the frontiers of knowledge or work close enough to those frontiers so that we can exploit without delay new discoveries whenever and wherever made.” (Bromley, Yochelson)
 - “We need a research and innovation policy, not a science and technology policy..., [in part because] the distinction between science and technology is vanishing.” (Branscomb)
 - “We need a creative research strategy with an enabling characteristic, coupled with research skills that we are still developing. The final step is figuring out what kind of research an innovation-based economy requires.” (Branscomb)
 - Policymakers want accountability, benchmarks, and a “connection between science investments and... public benefits.” (Nichols, Branscomb)

2. Policy design—not policy analysis—is the real challenge:

- “When I was in government, policy analysis was not my problem. It was how to stop doing dumb thing and do *any* of the smart things.” (Branscomb)
- “We need to focus on the fonts of wealth creation. And I think the strongest rationale for a vigorous research and innovation policy is that these activities are the real keys today to our economy....The public at large is now beginning to understand their importance. Certainly the people on the Hill get this connection.” (Rooney)
- It is perfectly appropriate for DARPA to explore fields in which the military value is not yet clear, provided there is a good intellectual case” for doing so. (Branscomb, Abshire)

3. The core mission agencies needed to implement long-range research and innovation are effectively managed, but education and balanced funding remain a challenge:

- “We did not talk much about the National Science Foundation or the National Institutes of Health...two bastions of basic research...[because] people think these agencies are running rather well.” (Teich)
- However, “there appears to be a growing funding imbalance” among the agencies. Teich)
- More importantly, neither NSF nor the Department of Education has effectively reformed K-12 science and math education. (Nichols, Branscomb)

4. Moreover, the national laboratories need clearer research direction and sustained funding: (Branscomb)

- “National laboratories are unique in dealing with long-range technological, multi-disciplinary problems...[some of which] are larger than a university can handle.”
- “National labs also contribute to human resource development.” (Branscomb)

H. Congress is Ready to Work with the White House

1. “Congress is key, regardless of the specifics of our national research policy.” (Watkins)

- “Nobody says, ‘By God, you elect me and you will have the finest S&T policy in the country.’ Eyes glaze over, forget it.” (Watkins)
- Nevertheless, “the timing is right” to work with Congress. (Watkins, Abshire, Bromley) Bi-partisan support is evident on a number of fronts: increased NSF and NIH funding, growing membership in caucuses (biotech, the internet), circulation of a resolution to increase R&D funding across the board (S. 296), and increased appropriations for FY2000 military R&D.

2. Members of Congress want a “managed investment environment,” agency accountability and an integrated budget. (Watkins, Bromley, Branscomb, Nichols)

- Congress is not about “to help any President restructure departments and agencies. But maybe the President and Congress can create a joint, bipartisan commission to examine the structure of key agencies. We do have a sick structure.” (Bromley)
 - A revived and revamped Office of Technology Assessment (OTA) might assist the policy process, provided reports are issued in a timely fashion (Nichols, Branscomb)
3. A rigorous White House budget process would make the overall policy process more vigorous:
- “All the agencies should be forced to help develop a unified budget for OMB and a unified presentation” to “the various committees that thought they had jurisdiction.” (Bromley)
 - “We ought to get to a five-year budget cycle on some of the long-range projects...and work with Congress...to give the research base in this country some stability.” (Watkins)

I. The U.S. Must Better Manage its International Research and Trade Affairs

1. “The United States is a terrible partner in big international science projects” (Branscomb), in part because “you can’t go to other nations late in the game and ask for money” (Watkins) and in part because, too often, we cancel programs or change plans unilaterally. (Teich)
- “The State Department isn’t even at the table when [agencies] make bilateral S&T agreements. We have over 200 in the Department of Energy alone—and 10, at the most, are worth doing.” (Watkins)
2. Several organizational remedies are available:
- The President could “give OSTP, the National Science Foundation and the mission agencies much more international responsibility, and State fewer responsibilities;” (Nichols)
 - The President could challenge the new Secretary to more effectively incorporate science and technology policy in a rejuvenated State Department or lose current S&T responsibilities; (Abshire)
 - State could “align its science policy with its economic policy.” (Solomon)
3. Because of his or her access to the President, the national science advisor should be involved in such international issues as:
- Direct foreign investment, which “goes in both directions...” and “generally is better for the United States.” (Nichols)
 - Granting temporary visas to foreign-born technical professionals. This “really is an education issue, viewed from a different angle” that foundations may be better suited to address than the NSF or Education Department. (Branscomb)