

EXECUTIVE OFFICE OF THE PRESIDENT  
PRESIDENT'S COMMITTEE OF ADVISORS ON SCIENCE AND TECHNOLOGY  
WASHINGTON, D.C. 20502

January 15, 2001

The Honorable Neal Lane  
Assistant to the President  
for Science and Technology  
Eisenhower Executive Office Building  
Washington, DC 20502

Dear Neal:

I speak for my colleagues on the President's Committee of Advisors on Science and Technology (PCAST) in saying it has been a privilege and a pleasure to serve as a member of PCAST for the past six years under the leadership of you, John Young, and Jack Gibbons. At your request, the PCAST members have written to me about their experiences on the Committee over the past six years. I have summarized their views on lessons learned and unfinished work of PCAST in this letter. We hope you and the next Administration will find this material useful.

We believe it is very important for the President to have a committee, such as PCAST, that can provide independent advice on science and technology (S&T) matters. A number of issues that our nation will face in the future (e.g., energy, health care, the economy, education, national security, the environment, air quality, and the information explosion) all have deep roots in S&T. However, many people making key decisions in our government (Legislative, Executive, and Judicial) or advising the President lack a background in science or technology. Thus, independent, quality S&T advice to the Administration has an important role.

PCAST had two goals:

- Conduct studies in areas of science and technology policy identified by the Committee; provide recommendations on the budget and the Federal S&T agenda through a series of major reports on strategic areas; and alert the Administration about potential impacts and recommend actions on emerging science and technology issues.
- Provide advice on important science and technology issues of immediate interest to the President, Vice President, and senior White House and agency officials.

Our assessment is we were very successful in our first goal. Early on we established energy, the environment, and education as strategic areas for the Committee to focus.

We completed ten major reports in these areas. The President and Vice President had a personal interest in those reports which led to new initiatives that were included in the President's proposed budget. Very capable and energetic support from OSTP staff has been crucial in completing these studies and the NSTC has been key in taking our recommendations and crafting major Administration initiatives. During this time we also worked on other areas including information infrastructure protection, preventing deadly conflicts, nanotechnologies, and principles for Federal investment in technology. The breadth of the PCAST activities is captured in the twenty-one publications issued over the past six years. I have included a list of our PCAST reports and their recommendations in Appendix A, the Administration initiatives in response to PCAST recommendations in Appendix B, and information on related budgets in Appendix C.

Unfortunately, we were not successful in our second goal except in a few cases, most notably in nuclear proliferation. PCAST has had a mixed set of roles including addressing specific issues, advocating for S&T, and communicating with the public through publications. This breadth of activities came both from our assignments and our own proclivities. PCAST would have had greater success in meeting its second goal if it were charged with providing objective analyses and advice on specific and important S&T issues facing senior White House and agency officials.

I will next describe the lessons learned from my PCAST colleagues. First on **the Committee**:

1. The membership of PCAST reflected the increasing complexity and diversity of policy issues that require S&T input. The mix of academic and industry leaders and our diverse backgrounds and views increased our credibility and perspectives. The stability of our membership allowed us to build sound working relationships. However, some of my colleagues had indicated that a shorter term of service would have been more appropriate than the six years that we had served, if the membership term had been staggered to assure continuity.
2. PCAST needed more access to the President and Vice President to allow us to be engaged in their evolving thinking on key S&T issues and so we could better focus our work on issues of immediate interest to them. However, PCAST did have regular contact with senior agency officials, which provided important input to our studies.
3. The Committee should identify a set of strategic areas and serious S&T topics with the President early in the Administration. This agenda and any questions of agency practices can then be pursued with confidence.
4. PCAST should have had a deeper involvement in questions of national security and international relations, providing independent advice to the President and Vice President. Members should be granted appropriate security clearances. The PCAST

study on the protection of nuclear materials in the former Soviet Union was very important. It resulted in the President ordering a President Decision Directive that embodied PCAST's recommendations. Our Committee could have done more work on other, equally important national security issues.

5. Support from OSTP staff has been critical. All of us are grateful to them. Without their support none of our studies would have been of such high quality or significance. However, OSTP could have provided more interaction and follow-through of PCAST recommendations with OMB, Congress, NSA, and other pertinent White House units. But, this will not be possible without a larger staff.

6. Establishing NSTC as a serious effort has been useful and is likely to become increasingly important in the future. As new areas (e.g., nanotechnology) become important and pervasive across departments and agencies, it will be essential to have an effective cross-government mechanism to arrive at well-grounded, broadly integrated policies. NSTC has made a reasonable start in this direction. More dialog between NSTC and PCAST is needed and should be encouraged in the future.

7. For our work and recommendations to have more impact, greater Congressional interaction – including more discussions with senior Congressional staff and key members of Congress – is needed.

The second area of our lessons learned is on **the work of PCAST --- the reports and letters to the President:**

1. For the set of strategic areas defined with the President early in the Administration, PCAST should complete a series of major reports during the course of a given Administration. They should contain recommendations that affect the S&T budget and the Federal S&T agenda.

2. PCAST meetings should address current science and technology issues followed by a communication to the President to summarize the advantages and disadvantages of those issues affecting policy formulation. If appropriate, a brief report could also be published in the lay press.

3. For reports to have maximum impact, the following points are important:
  - Topic selection responsive to President's and Vice President's interests
  - Small panels composed for balance, including subject matter expertise from outside PCAST if needed, and senior generalists with no stake in the outcome
  - Support from OSTP staff
  - Written to be non-partisan
  - Endorsement of findings by the full PCAST
  - Briefings for the President and Vice President on all major reports
  - Follow-up with the rest of the Administration
  - Follow-up with the Congress
  - Follow-up with the public: have a media strategy
  - Follow up with NGOs and industry groups on major studies
  - Fund PCAST studies in some way other than through the agencies that are being studied, to insure independence of views presented
  - Provide benefits from continuity and a cumulative experience base

Finally, I will very briefly list the unfinished areas of work and some areas that still need to be addressed.

- In our strategic areas of focus – energy, the environment, and education – recommendations from our reports have only partially been implemented. Follow-up is required to maintain high-level Administration attention and to finish implementing our recommendations.

John Holdren and Peter Raven have written very thoughtful and detailed summaries of what has been accomplished and what remains to be done on the energy and environment recommendations. I have included their summaries in Appendix D and E.

In addition, the PCAST recommendation to initiate a major program of experimental research on K-12 educational techniques to “determine which education techniques actually work, and to find ways to improve them” has led to the Interagency Education Research Initiative. This research is important to the nation and needs ongoing attention.

- The development of an Institute for Information Infrastructure Protection and the International Clean Energy Initiative are two PCAST recommendations that have been adopted by the Administration, but remain essentially unfunded by Congress. Both are crucial and need continued attention to get funded in the future.
- Topics that the Committee proposed for future work include:

- Energy and climate
  - S&T capacity building in developing countries
  - Management of Federal Lands
  - Reform of National Labs
  - Genetically modified foods
  - Biodefense
  - Greater focus on the biological and behavioral sciences
- Finally, there are the issues that we took on and dealt with that still need stewardship, including: human resources development and university-government research partnerships.

In conclusion, again thank you, and it was a pleasure to serve on PCAST and have the opportunity to work with you, John, and Jack, and with my PCAST colleagues.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lilian Wu".

Lilian Wu

Attachments