D. Summaries of the Small Group Sessions

The small group process included two sessions. In the first, participants divided into three sections and each considered the question, What should a program on research policy as an agent of change look like? The second included two sections, one on ethics and democratic perspectives and one on measurement and assessment.

Abbreviated Summary of First Session (Three Sections)

To understand research policy as an agent of change requires an understanding of the human values, behaviors, and relationships that shape, and are shaped by, new knowledge; the human resources, scientific workforce, educational programs, citizen skills and capacity, and institutional governing arrangements of scientifically and technologically advanced democracies; as well as the flows of people, ideas, norms, and rules, both within and among societies.

A research policy is a strategy for achieving developments of new knowledge, new forms of expertise, and new infrastructures. Research policy includes not only direct public actions but also the knowledge production, use, and uptake activities of courts, regulatory agencies, scientific advisory bodies, as well as related activities in the private sector, both explicit and implicit, including the corporate sector and civil society.

Research areas should include historical, comparative and international studies, and address such issues as priorities for and framing of research policy and the constitution of expertise; the development of specific arrangements, including relationships between private and public sector organizations; and measurement and assessments of benefits and costs and issues of distributive and procedural justice,

Research methods in this area must have a major component of humanistic and social sciences, including quantitative and qualitative approaches. Methods should be geared to the understanding of research policy as networked and dynamic, and will include work in political science, economics, sociology, anthropology, and STS, including, where appropriate, engagement with science and engineering communities. All methods used in these fields are appropriate: case studies: historical and contemporary; comparative research; legal, political, and institutional analysis; ethnography; modeling; statistical analysis; measurement issues; evaluation and assessment methods; theory development and evaluation.

Mechanisms should include cross-fertilization activities, possibly through fellowships, that would enable other kinds of groups, e.g., officials in industry, civil society, government, to come to university or for academics to spend time into these other settings. There is a strong need to build both research and societal capacity in this area, making the normal 2 year research grant insufficient. Strong consideration should be given to training programs, infrastructure awards, etc. There is a strong need for this program to partner with other research agencies, OMB, state governments, international institutions, etc., to fully capture the broad range of research policy, to provide additional funds for this important activity, and to ensure access for researchers to actors and data in these other settings.

There are a series of international changes in the funding and incentives for research that are not recognized and appreciated in the US that have implications for future international competitiveness. While European scholars are engaged in a series of international comparisons, there is little participation by American scholars due to a lack comparable data and limited funding opportunities. The lack of sophisticated metrics predicated on a nuanced understanding of S&T could shift attention to short term outcomes to the detriment of long term competitiveness. Part of the Research Policy as an Agent of Change research agenda should include projects to enhance understanding of the innovation process. This agenda should pay attention to the diversity of outcomes from support for research, examining explicit and implicit goals and the variety of involved actors and mechanisms and intended and unintended consequences of policies and behaviors – micro and macro effects on the systems and their components.

Research policy, construed broadly, is transformative. For example, research universities do not merely carry out research. In addition to providing funds, research policy sets forth a complex set of conditions under which the university must operate when it does that research. Those conditions may also affect how and in what ways the university gets research funding from the private sector. From research on human subjects to rules about research on proprietary topics to licensing patents that its researchers create, universities change their structures and practices in response to research policy, in addition to taking money and seeking to influence future policy.

Research policies transform the phenomena on which science operates. Recent patent policy provides a useful example. The changed notion of "non-obviousness" has transformed the research enterprise and indeed the very character of nature. In the other direction, research practice and its results required the US patent office to respond. In addition to creating knowledge, research policy leaves gaps in knowledge, providing resources to some areas and not others. For example, the government simply bans some research on human beings on the grounds that performing the work would be immoral.

The patterns of funding across broad fields of science or technology emerge implicitly from a welter of other policy decisions, and more detailed choices about funding within a field come from a host of influences that include members of the scientific community being funded. An older literature on R&D policy referred to this issue as the problem of priority setting, pointing out that the United States did not set its priorities in a coherent fashion. It would be productive to study the dogs that do not bark, and assess more systematically the gaps in knowledge that research policy leaves.

A major research program in RPAC requires and would greatly benefit from important infrastructure. Improvements to this infrastructure should emphasize creating a lively network or community of scholars. This network would provide research opportunities for scholars and couple them with training for graduate students. It might include a physical place with strong access to data resources and primary documents (do we need our own Hagley Library?). Particular networking activities could start with face-to-face meetings and then continue over email. In the early stages such groups could be trying to figure out the resources they need to solve particular problem. Other groups would initiate directly some new research. To provide the groups focus and enable them to produce tangible results, they would initially focus on a particular policy problem or theme. Later one could assemble groups across themes, seeking a larger synthesis.

Democratic Perspectives/Ethics and Values Discussion Group

One important feature of an RPAC research program is attention to unpacking the often-implicit assumptions and practices involved in research policy. These can take many different forms and appear in many different parts of the policy process. They need to be unpacked to make them more amenable to a democratic society and to making research policy a positive agent of change.

Numerous research topics and sites would provide fruitful material for research. In no particular order, they are:

- Who gets to participate in RPAC decisions and under what circumstances? How are conflicts about participants resolved?

- What forms of policy making and participation present alternatives to the linear models of both S&T innovation and participation in such innovation? Have any of those alternative models been institutionalized? In the process, have any of them been scientized and lost some of their ability to capture and deal with unexpected, non-linear changes, what one participant called the "ragged edges of experience"?

- Research sites would include research universities, corporations, and the intersection of states, firms, and civil societies.

Numerous methods could contribute to an RPAC research program. In particular this group emphasized:

- Case studies of non-traditional forms of knowledge generation.

- Comparative analyses.

- Demonstration projects.

- Ethnographic methods.

- Historical analyses.

The group offered, not surprisingly, a wide variety of possible specific research topics. The following illustrates, rather than bounds, the range of topics.

- A re-evaluation of the research university that is reflexive and sensitive to institutional issues. This could include quite specific institutional adaptations to RPAC issues, such as the creation of technology transfer offices, as well as the broader questions of the effects of corporate funding for research or classified government funding for research on the culture and practices of the university.
- A host of issues associated with the development and diffusion of genetically modified food crops, such as the farm-scale trials of such crops in the UK.

- Discourses of evaluation. What are those discourses, including but not limited to peer review, and how have they changed over time?

- The relationships between types of fact-finding, deliberative, or other processes and social consensus or acceptance about knowledge claims concerning controversial issues. Can such knowledge actually lead to a resolution of the dispute?

- How does the National Science Foundation count as topics that are properly within its purview? This question can have many subtleties when talking about programs in chemistry and physics and even more dispute when looking at cross-disciplinary topics like ITR and nanotechnology research.

- How do pharmaceutical firms decide which drugs to research and produce and which ones to ignore? How does policy affect those decisions?

- How are critical scientific analyses driven into oppositional status and what are the consequences of that? What are the paths and circumstances under which oppositional knowledge enters the mainstream?

Data and Measurement Group Summary

1. What are the research policy issues and corresponding data needs?

The community of scholars needs greater access to data. The EU and Canada have undertaken new surveys on innovative activity and no comparable data exists in the US.

There is new emphasis on government accountability. Much of this activity is conducted in-house or contracted to external evaluators, with virtually no peer review or referring process on these efforts. The community of scholars would like to be partners in this federal evaluation effort and other program evaluation efforts.

Finally, there is a need to develop new metrics and new methodologies – what would be considered basic research for this community. These efforts would have practical applications. In addition, there is a need to model the endogeneity of research policy and develop methods for envisioning alternative futures.

2. What infrastructure exists; how could it be better used?

There is limited dissemination of the types of data that are available and how the data may be accessed. The costs of research projects to analyze these data are significantly less than the costs associated with the original data collection efforts. A compendium cataloging S&T policy and research data could help catalyze the community of scholars. Existing surveys tend to focus on public data sources and ignore proprietary data. These surveys typically do not consider the quality of data.

The EU has instituted a new innovation survey that is providing useful data across Europe. There is no equivalent source in the US and a comparison of the data sources US and EU would be informative.

There are numerous access problems. A powerful tool is the Thomson ISI® (founded as the Institute for Scientific Information) which provides publication and citation information. Unfortunately it has become an expensive resource, and there is a perceived need to challenge ISI. The most interesting current work links different data sources. As a result of new information technologies there are privacy concerns that while intended to prohibit commercial firms from exploiting personal data may limit the ability of academics to link these data. In addition, there are many barriers to linking various data sources by federal agencies that collect data and could potentially benefit from the product of the analysis. Federal Government mission agencies collect data on a variety of indicators such as the number and characteristics of CRADAS. While this data is technically public data it is not currently available. Who negotiates rights to access data? Currently, access is negotiated on an individual basis which is inefficient and often frustrating for researchers. Certainly having standard procedures, policies and adjudication processes would facilitate access to data. In addition, across federal agencies there are no common criteria for reporting research results.

Given these concerns, several responses would be useful. NSF should consider ways to encourage international data coordination, perhaps via its International Office. Research on research evaluation, its pros and cons, should be given priority for support. Scholarship to identify gaps and opportunities for improvement in data series relevant to research on research policy should be encouraged. NSF should work with other research and development agencies to examine data resources and needs.