



Under Secretary for Science

Washington, DC 20585

October 1, 2007

Dr. Michelle Broido
Associate Vice Chancellor for Basic Biomedical Research
and Director, Office of Research, Health Sciences
University of Pittsburgh
Scaife Hall, Suite 401
3550 Terrace Street
Pittsburgh, PA 15261

Dear Dr. Broido:

I would like BERAC to take on a new challenge relating to BER's Climate Change Research Program. For over two decades, DOE has been among the leading agencies supporting climate change research. The Department has invested more than \$1.8 billion in climate change research from 1990 to date through the U.S. Global Change Research Program (GCRP) and its successor, the U.S. Climate Change Science Program (CCSP). While much has been learned about climate forcing, climate response and climate change consequences since the inception of the GCRP and the CCSP, significant gaps remain in our understanding and significant questions have not been resolved.

I request that BERAC organize and conduct a workshop to bring together some of the leading experts (regardless of affiliation) to help identify the outstanding scientific grand challenges in climate change research related to each of the questions listed below. The workshop should also identify research priorities and a path forward, including the kinds of research capabilities that are needed to address the challenges. I would like the workshop to provide a report that will be of use in guiding DOE's strategic planning of and future investments in climate change research.

- What are the grand challenges in understanding Earth's past and present climate variability and forcing? What key research, observational and computational capabilities are necessary to understand the past and present climate and the forcing responsible for past and present changes in climate?
- What are the grand challenges in reducing uncertainty and improving confidence in projecting how the Earth's climate at regional to global scales may change in the future in response to natural and/or human-induced forcing? What key basic research, observational and computational capabilities are necessary to reduce uncertainty and improve confidence in projecting future climate response to such forcing?
- What are the grand challenges in understanding and predicting the sensitivity and adaptability of managed and natural ecosystems to climate change? What key basic research and research capabilities, including observational, experimental,



- and computational facilities are necessary to understand and predict the sensitivity and adaptability of such systems to changes in climate?
- What are the grand challenges in integrating data and knowledge from research and observations on climate and Earth system processes into climate and Earth system models and modeling? What is needed to ensure that data on climate and Earth system processes are effectively used to assess model performance and help define data and knowledge gaps that require new or additional process research, observations, or capabilities for collecting the needed data?

The current state of knowledge about climate change, impacts, vulnerabilities, and adaptation has been laid out in the recent IPCC Fourth Assessment Reports of Working Groups I and II. Workshop participants should consider these reports as a relatively recent authoritative source of information on the current state of climate change science.

I request that BERAC designate a Chair to identify and organize an executive group to plan and implement the workshop. The group should work collectively to refine and frame the fundamental questions to be the focus of the workshop panels and to identify experts who should be invited to attend. Participation in the workshop should be by invitation only. Lastly, I request that the workshop be organized and implemented as soon as practical so that a report can be submitted for review and approval by the full committee at its spring 2008 meeting if possible.

Sincerely,

A handwritten signature in cursive script that reads "Raymond L. Orbach".

Raymond L. Orbach