Department of Energy
Office of Science
Washington, DC 20585

JUL 0 1 2009

Office of the Director

Professor John C. Hemminger
Dean and Professor of Chemistry
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Dear Professor Hemminger:

Thank you very much for your continuing service as the Chair of the Basic Energy Sciences Advisory Committee (BESAC). During your tenure as Chair of the BESAC, the Committee has delivered several important reports: *Opportunities for Discovery: Theory and Computation in Basic Energy Sciences*; *Directing Matter and Energy: Five Challenges for Science and the Imagination*; *New Science for a Secure and Sustainable Energy Future*; and *Next-Generation Photon Sources for Grand Challenges in Science and Energy*. During this time BESAC also has completed six Committee of Visitors (COV) reports. These contributions have had a considerable positive impact on the strategic direction of the Basic Energy Sciences program.

I am extremely grateful that you have agreed to remain as Chair of the BESAC for the next two-year term. It is particularly important that BESAC continue to provide high-level advice to the Office of Science during this challenging and exciting time for science in the United States.

The BESAC reports that identified the grand challenges in energy science in combination with the ten Basic Energy Sciences (BES) reports on Basic Research Needs for energy technologies have had a particularly significant impact. These reports clarified the importance of fundamental grand challenges science to the development of future solutions to our most critical energy and environmental challenges.

I would now like BESAC to pursue a follow-on study to those of the past seven years that links basic research with more applied problems in energy technologies. This study should tie together the ten BES reports on Basic Research Needs for energy technologies. This new study should be regarded as the companion study to the grand challenges report, but with a focus on the basic science drivers that will be essential to the more applied issues of energy science.

I recommend the following as the three main parts to this new study:

1. Summarize the science themes that emerged from the BESAC reports *Basic Research Needs for a Secure Energy Future* and the follow-on BES *Basic Research Needs* topical reports with an emphasis on the needs of more applied energy technologies. Identify grand challenges science drivers that are likely to have an impact in the energy arena in the near term.

2. Identify how the suite of BES-supported and -managed scientific user facilities can impact basic and applied research for energy.

3. Identify other major impediments to successful achievement and implementation of transformative energy technologies, including potential deficits in human capital and workforce development, and possible solutions to these problems.

Include in your deliberations participants with the appropriate expertise from the workshops that produced the *Basic Research Needs for a Secure Energy Future* and the follow-on BES *Basic Research Needs* reports. Expertise should be drawn from pertinent universities, national laboratories, and high-technology industries. Also include participants with the appropriate technical expertise to translate the science needs into tools and facilities.

In addressing this new charge, I anticipate the need for two reports. The first would be a short report of a less technical nature along the lines of the *New Science for a Secure and Sustainable Energy Future* and the second would be a more detailed technical report to provide detailed justification of your findings and guidance for the Office of Science.

In addition, I would like you to continue to oversee the COVs through which BESAC provides an assessment of matters pertaining to program decisions. The COVs should review every part of the BES program every three years on a rotating basis. The COVs should assess the efficacy and quality of the processes used to solicit, review, recommend, monitor, and document funding actions and assess the quality of the resulting portfolio. The national and international standing of the elements are part of the evaluation of the breadth and depth of the portfolio. The portfolio under review by a COV generally includes all actions – both awards and declinations – for universities, national laboratories, and industry administered by the program over a three-year period.

I look forward to working with you in the months ahead on these important subjects.

Sincerely,

W. F. Brinkman