



Department of Energy
Office of Science
Washington, DC 20585

FEB 11 2014

Professor John C. Hemminger
Vice Chancellor for Research
Professor of Chemistry
Aldrich Hall 160
University of California, Irvine
Irvine, California 92697

Dear Professor Hemminger:

I very much appreciate your continued leadership as Chair of the Basic Energy Sciences Advisory Committee (BESAC). I also want to express my sincere appreciation for the superb job that you did during your testimony, on October 30, 2013, at the Subcommittee on Energy Hearing - *Providing the Tools for Scientific Discovery and Basic Energy Research: The Department of Energy Science Mission* before the House Committee on Science, Space, and Technology. Your testimony was articulate, focused, and had an enormous impact.

Under your leadership during the past few years, BESAC activities have produced extraordinary results that already have – and will continue to have – broad impacts in the BES community. The BESAC foundational report, *Basic Research Needs to Assure a Secure Energy Future*, the BES Basic Research Needs studies, and follow-on BESAC reports have helped to chart a broad visionary course for the BES research portfolio and inspire the creation of new research modalities (e.g., EFRCs, Hubs, and Early Career Awards). In particular, the 2007 BES report, *Directing Matter and Energy: Five Challenges for Science and the Imagination*—which depicts control sciences at the electronic, atomic, and molecular levels—represents a revolutionary view of 21st century fundamental science serving the BES community.

During the coming year, I would like BESAC to take on a new challenge relating to the BES research program. The new BESAC study should evaluate the breakthrough potential of current and prospective energy science frontiers based on how well the research advances the five grand science challenges. Your report will advise BES in its future development of focused, effective research strategies for sustained U.S. leadership in science innovation and energy research.

I ask BESAC to consider the following questions in formulating the study plan:

- What progress has been achieved in our understanding of the five BESAC Grand Science Challenges?
- What impact has advancement in the five Grand Science Challenges had on addressing DOE's energy missions? With the evolution of energy technology and the U.S. energy

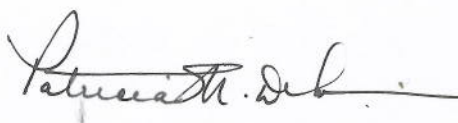


landscape, what fundamental new knowledge areas are needed to further advance the energy sciences? Please consider examples where filling the knowledge gaps will have direct impacts on energy sciences.

- What should the balance of funding modalities (e.g., core research, EFRCs, Hubs) be for BES to fully capitalize on the emerging opportunities?
- Identify basic research areas that may not be sufficiently supported or represented in the US community to fully address the DOE's missions.

If you have any further questions, please contact me or Harriet Kung, Associate Director, Office of Basic Energy Sciences at (301) 903-3081.

Sincerely,

A handwritten signature in black ink, appearing to read "Patricia M. Dehmer". The signature is fluid and cursive, with a long horizontal line extending to the right.

Patricia M. Dehmer
Acting Director
Office of Science