CALIFORNIA INSTITUTE OF TECHNOLOGY

April 13, 2011

RE: PROPOSED COMMENTS ON THE DEPARTMENT OF ENERGY QUADRENNIAL TECHNOLOGY REVIEW

On behalf of the California Institute of Technology, we would like to join our university organizations in submitting public comments on the Department of Energy's (DOE) Quadrennial Technology Review to assess and transform DOE's energy technology development programs. These programs include the Advanced Research Projects Agency-Energy (ARPA-E), and the Offices of Electricity Delivery & Energy Reliability, Energy Efficiency & Renewable Energy, Fossil Energy, and Nuclear Energy. They also include annual loan guarantee and direct loan programs to eligible clean energy projects and manufacturers of advanced vehicle technologies. We recognize that DOE is seeking to advance the President's ambitious goals of supplying the nation with clean energy, deploying electric vehicles, reducing greenhouse gas emissions, and reducing the use of foreign oil by one-third by 2025. We also acknowledge the Department's goal to better integrate basic and applied research in the energy sector to generate increased commercial development of advanced energy technologies in the U.S. The President's FY 2012 budget request for DOE seeks funding for initiatives that could bridge the gap between basic research and commercial development of advanced energy technologies and address some of our most pressing energy challenges. These include the use of modeling and simulation techniques, multi-disciplinary and multi-institutional collaborations, and large-scale collaborations through the Energy Innovation Hubs. We believe that universities can play a critical role in this effort , especially in a time of increasing budget constraints, and request that DOE capitalize on our expertise in basic energy research by establishing a formal initiative to work with universities to advance the broader goals of DOE's energy technology programs.

The Department has shown signs of better engaging the university community with its modest innovation ecosystems initiative which sought new ideas to promote the commercialization of new energy technologies. Universities are already actively engaged in successful collaborative efforts of this nature with other federal agencies that could serve as models for such collaborations with DOE.

At the Department of Commerce, University of Michigan President Mary Sue Coleman is leading an advisory council to review how the university community and federal laboratories can better contribute to the Administration's goal of increasing the translation of federally funded basic research to help establish more startup companies in the U.S. and promote economic growth.

In a recent letter (attached) to Secretary of Commerce Gary Locke, President Coleman and her academic colleagues outlined the contributions that the nation's colleges and universities are making to innovation. A similar advisory council could be named for DOE to actively work with the academic community to define those points in the energy innovation pipeline where universities can have the greatest impact in furthering the connections between basic research, applied research, demonstration, and deployment.

The contributions identified by President Coleman and the Department of Commerce advisory council listed below are consistent with many of the goals outlined by Secretary of Energy Chu. They include:

- Promoting student innovation and entrepreneurship;
- Encouraging faculty innovation and entrepreneurship;
- Actively supporting the university technology transfer function;
- Facilitating university-industry collaboration;
- Engaging with regional and local economic development efforts; and
- Recognizing exemplary economic engagement.

The National Aeronautics and Space Administration (NASA) has also revamped its technology development program to include an increased emphasis on partnerships with academia and industry to reinvigorate NASA as a cutting-edge agency. Like DOE, NASA is mission driven and is seeking a new generation of young scientists to carry on the legacy of the agency. The NASA approach could also be considered as a model by DOE to more actively engage universities and to make the broader connection between basic research and applied research and eventual commercialization of new technologies. The NASA Space Technology Development approach that could engage the talent of the nation's universities in the energy technology enterprise would include:

- Early Stage Innovation – In this program, academia, industry, and the federal government focus on visions of the future to take the long-term view of technology challenges and potential goals.
- One thrust in this program – NIAC – would capture university talent and expertise. NIAC is the NASA Innovative Advanced Concepts Program. A DOE program modeled on NIAC would challenge students and faculty to develop innovative concepts for new energy technologies. It would also cultivate connections for students as potential DOE employees in its national laboratories or at headquarters.
- Game-changing Technology – This step tests the feasibility of novel, early stage ideas with the potential to make revolutionary leaps forward in developing new technologies. ARPA-E performs this function for DOE, but there is a recognized gap between the great idea and the willingness of industry to take on the commercialization of that new technology.
- An interim step of carrying out a proof-of-concept or pilot demonstration is a role that universities might easily fulfill. In fact, this approach was recognized in the Administration's recent announcement by DOE, the Department of Commerce, and others, of the i6 Green Challenge to Promote Clean Energy Innovation and Economic Growth. This initiative would establish Proof of Concept Centers to support the entrepreneurship process for innovation in energy, including renewable energy, energy efficiency, and green building technologies.

- Many universities have expertise in advanced manufacturing and in logistics that can address some of the major challenges in commercializing new energy technologies.

We hope that DOE, in searching for the most efficient means of accelerating the development of advanced energy technologies in the U.S., will use the university community as a resource in bridging the gap between federally funded basic research and the development and commercialization of new energy technologies. There are strategic points in the innovation pipeline that universities are uniquely positioned to fill with the added benefit of training the next generation of scientists and engineers so urgently needed by federal science agencies within the next ten years.

Sincerely,

Jean-Lou Chameau

enc: DOC Collaboration Sub-Committee Letter 3-28-11