April 15, 2011

To: Dr. Steven E. Koonin, Under Secretary for Science
and the DOE-QTR Team
U. S. Department of Energy

From: Carnegie Mellon University
The Pennsylvania State University
University of Pittsburgh
Virginia Tech
West Virginia University

RE: RFI Feedback on DOE-QTR Framing Document

We appreciate this opportunity to provide feedback on the questions posed in the March 14 Request for Information and on the framing document that has been developed to facilitate stakeholder engagement during the course of the Department of Energy's recently initiated Quadrennial Technology Review process.

While we intend to contribute specialized expertise in a number of areas to support the QTR process during the coming months, we focus this letter on one critical and overarching recommendation: It is critical to maintain strong and steady funding for Fossil Energy programming -- including research, development, innovation and demonstration.

Our five-university partnership has been established to enable close collaboration on research, education and innovation-led, regional economic growth in areas where our work can contribute effectively to addressing the Nation's energy challenges. We have longstanding productive relationships with the Department of Energy's national laboratory system as well as with a number of industry partners. Since 2009, within a research and engineering support services contract led by URS Corporation for the DOE National Energy Technology Laboratory, we have also been conducting some of our energy-related work as the NETL Regional University Alliance, or NETL-RUA.

We strongly support the Department's efforts through this Review to develop a consistent, evidence-based set of policy guidelines and funding priorities for these multi-year efforts in which science, technology, economics, and energy policy intertwine. Our experience validates the fundamental assertion in this framing document that analytically-based priorities and coordination of RD&D efforts with policy are essential to facilitate the eventual successful deployment of new energy technologies and systems by the for-profit sector.

The November report from the President’s Council of Advisors on Science and Technology (PCAST), "Accelerating the Pace of Change in Energy Technologies Through an Integrated Federal Energy Policy," draws upon work led by a member of our team, Professor Edward S. Rubin, and reproduces a graphic he presented in 2005. His research demonstrated that government action has been a key factor in accelerating or hindering the processes of invention, translation, adoption, and diffusion of energy technology innovations. Evidence-based policy that is consistent over time is critical for stimulating technological innovation and enabling its effective transition to widespread beneficial use, private-sector job creation and commercial-scale sustainability.

Our most important recommendation for the DOE-QTR Team is to consider carefully the funding balance as you seek to drive energy technology innovation toward national goals for economic and energy security over the long term. In particular, we believe it will be essential to maintain significant funding levels for fossil energy research and technology development even while ramping up support for the renewable platforms that we all know will be needed to replace the current dominant resources.

As noted in the DOE-QTR framing document, currently available carbon capture and sequestration technologies are neither cost-effective nor demonstrated with electric generation. The document also points out the magnitude of the existing global dependence on fossil energy. For example (from p. 39):

> Fossil fuels supply 80% of the world's energy, and coal accounts for 25% of world energy supply and 40% of global carbon emissions. The U.S. possesses 1/4 of the known coal resource, and the U.S., Russia, China and India together account for 2/3 of world reserves. The existing and predicted coal-burning energy infrastructure in these countries implies substantial continued coal use in the next few decades.

Given the broad consensus among experts about the long time frame that will be required to bring new renewable energy technologies to scale, we believe that a strong program of research and development in fossil energy will be required for some time to come. Technologies to enable cleaner, more efficient use of these resources are beginning to be developed, but much work is still needed, even for the most promising of the existing innovations to become mature enough as the basis for competitive commercial application.

Maintaining current funding levels for fossil energy RD&D, while also investing to invent and develop hybrid fossil-renewable platforms and other energy transition enablers, would be the best way to ensure the nation's energy security while renewable energy development progresses. New carbon management approaches and other clean fossil energy technologies would also provide opportunities for domestic manufacturing and export-focused job creation to satisfy overseas demand for these innovations.

We look forward to working with you and our colleagues around the nation throughout the Quadrennial Technology Review process.

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