ACEEE
American Council for an Energy-Efficient Economy
529 14th Street, N. W., Suite 600 Washington, D.C. 20045 P 202.507.4000 F 202.429.2248 W www.aceee.org

April 15, 2011

Quadrennial Review
Office of the Under Secretary for Science (S4)
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Quadrennial Review Team,

I am writing to provide a few comments on the Quadrennial Technology Review Framing Document on behalf of the American Council for an Energy-Efficient Economy (ACEEE). ACEEE is a non-profit research organization founded in 1980 dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection.

In general, we found the Framing Document to be well thought-out and presented. The six strategies outlined seem very reasonable. Our comments have to do with some of the details, as follows:

Transport: One of the elements listed is alternative fossil fuels. This section notes that DOE presently has no research programs in this area. We recommend that this section be deleted as alternative fossil fuels should be a lower priority than the other items listed. In particular, with the possible exception of liquids derived from natural gas, all alternative fuels derived from fossil fuels have very high environmental costs, from extraction to consumption.

Efficiency in Buildings: We believe the elements listed are all reasonable. In addition, we recommend that a sixth element be added on Plug-Loads and Other Miscellaneous Uses. According to the 2011 AEO, in the residential sector, electronics and "other uses" accounted for 23% of total energy use in 2010 and this share is projected to rise to 30% by 2035. Likewise, in the commercial sector, "other uses" were 31% of total energy in 2010 and are projected to be 39% in 2035. The elements of these other uses are not well understood. DOE should conduct studies to better understand the key "other uses" and then should conduct research on ways to reduce this use. These uses are too large to be ignored. In addition, as part of its work on the elements listed, we recommend that DOE work on developing reduced cost strategies for monitoring large numbers of buildings of all important types. In order to best pursue whole-building and other system approaches, we need deeper understanding of energy use of different systems in actual buildings. Conducting such monitoring is expensive with current technology, hence the need for reduced-cost approaches.

There is also an important potential role for DOE in *market aggregation.* In aggregate, the federal government is a huge landlord and energy consumer. Although FEMP has limited authority and its initial pilot was not completely successful, we recommend continued work toward large acquisition programs. In particular, we recommend investigating the potential of working with others on multi-year, increasing scale and declining cost acquisition of equipment – practices that have been widely used by industry for multi-year component purchases for equipment components. This is a very promising way to encourage innovation in a structure which is based on results and allows industry to obtain financing.

Industrial Efficiency: In comparison to the other sections, the industrial section is very brief and needs to be fleshed out more. We recommend that a more complete industrial section address the following three elements:

1. *RD&D*. The development and demonstration of new technologies, processes and products is critical to the U.S. industrial sector continuing to reduce its energy intensity. While the department has recently focused on long-term, high risk research activities, it is important that the program maintain a balanced research portfolio of near-, mid- and long-term RD&D activities. Near and mid-term activities over the past two decades have contributed to major energy intensity reductions achieved in many industrial sectors, as was demonstrated in DOE's recent Steel Industry white paper, which documents how the steel industry has reduced its energy intensity by 52% over the past 20 years as they have invested $65 billion in modernization. These nearer term activities, typified by the *Industries of the Future* program, have found their greatest impacts by focusing on industry-specific research challenges identified and co-funded by industry partners, with impacts being realized in as little as 7 years. These RD&D activities are particularly critical as many industrial firms are considering major capital investments to modernize their domestic manufacturing capacity. These nearer-term activities should be complemented with longer-term activities that will develop the new processes, materials and products that will enable the continuous modernization of U.S. manufacturing. These activities should be undertaken in coordination with other research efforts at NIST and DoD.

2. *Deployment and Technical Assistance.* As the Draft notes, many opportunities exist to improve manufacturing facilities through the application of existing technology and knowledge. DOE has been a primary public source of technical information and assistance to many industrial firms. Over the past 5 years, we have seen a proliferation of state and rate-payer funded industrial programs. We encourage ITP to strategically leverage these programs, by partnering with them and providing tools and resource to enhance the effectiveness of these efforts. ITP currently runs two particularly successful deployment efforts, the *Industrial Assessment Centers* (IAC) and *Regional Clean Energy Application Centers* (RAC) that have a proven track record of success. DOE should also look to partner with programs from other agencies to capture the synergies available from collaboration. In particular, DOE should work in a more coordinated fashion with DoC, NIST, DoL, SBA and EPA to deliver comprehensive services. A model for this collaboration exists with the fairly-new *E3* effort, The most commonly cited barrier to investment in industrial modernization is access to capital. DOE could play a critical role, working with other agencies, to facilitate the access to private and public funding to enable investments in plant modernization.

   In the past, DOE has played a critical role in providing technical assistance to industrial firms to enable them to make modernization investments that allow their facilities to become more efficient. These efforts, such as *Motor Challenge,* have been missed in the marketplace in recent years as new minimum efficiency equipment standards have gone into effect without DOE's engagement to assist customers in preparing for these market changes. ITP should explore reactivating these technical assistance efforts jointly implemented with market allies, such as trade associations and equipment manufacturers. These efforts can be focused on technology areas or on management practices, such as the program's *Superior Energy Performance,* which seeks to support acceptance and implementation of the ISO 50001 plant energy efficiency performance standard.

3. *CHP and Waste Energy Recovery.* DOE and EPA have identified CHP and recovered waste energy as significant efficiency opportunities. Forthcoming ACEEE research suggests that utility regulatory and project cost financing continue to limit projects. DOE played an important leadership role beginning in the late 1990s in building up the CHP industry that has almost doubled installed capacity over the past decade. The RAC's have continued to play a crucial role at the regional level. We encourage DOE to use its power of convening to bring the stakeholders together to identify a new national road map to again double the share of CHP over the next decade. These efforts need to be supported by continued regulatory policy and market research, technical assistance and education on best practices.

Modernize the Grid: The components listed are reasonable but one critical component is missing – the interface between the grid and the consumer. Quite a few consumers and regulators oppose "smart grid" investments because they do not believe the benefits are greater than the costs from the consumer perspective. From work ACEEE has done in this area, we believe that the benefits can be substantial *if* information from smart meters is provided to consumers in ways that they can understand and act upon, and in ways that will continue to encourage them to act over time, so that savings persist. But without this critical link, the benefit-cost relationship is tenuous. To help address this critical link, we recommend that DOE add a component on research to help develop best practice approaches that use the smart grid to achieve and maintain substantial consumer energy and energy cost savings.

If you have any questions about these comments, please do not hesitate to contact me.

Sincerely,

Steven M. Nadel
Executive Director