



Overview of NCEP Projects Focusing on Energy Technology Policy

The National Commission on Energy Policy (NCEP) has two key efforts underway that may contribute to the goals and discussion of the Climate Technology Innovation meeting on May 28 and 29, 2008. They are the Institutions and Mechanisms and the Low-Carbon Technology Pathways projects, each described in greater detail below. The first focuses on the current and future structure of publicly-funded research and development programs and explores applying or altering this structure to address the challenges of energy production and mitigating its impact on greenhouse gas emissions and climate change. The second project is concerned with low-carbon energy technologies themselves; the current stage of development, and the institutional, policy, and cost barriers associated with greater deployment.

Institutions and Mechanisms Project:

This project examines the existing institutional management structures and funding sources for research, development, demonstration and deployment (RDD&D) of technologies most likely to result in greenhouse gas reductions and climate change mitigation. Through a series of colloquia bringing together leaders from the private sector, relevant federal government agencies, universities, and national laboratories, this project also aims to explore possibilities for better utilizing funding for future RDD&D processes for these technologies and optimizing collaboration between institutions to more effectively bring technologies to commercial viability.

At the first colloquium in the series, held in July 2007 and focused on institutional models, participants discussed various historical approaches to managing R&D and how these management options relate to basic and applied research for climate change-mitigating technologies, especially if substantial new financial resources are made available through the proceeds from a cap and trade program allowance auction. The second colloquium was held in early May 2008 and focused on collaborative R&D projects among industry, national laboratories, universities, and federal agencies. Participants also discussed existing models and structures (such as Defense Advanced Research Projects Agency or the National Institutes of Health) that could potentially guide R&D processes at the scale and scope necessary to address the challenges of climate change mitigation. Participants also discussed which approaches would ease the transitions between basic and applied research through development and deployment, and most effectively bring technologies to the final stage of commercialization.

Currently, the US Department of Energy (DOE) conducts basic and applied research in conjunction with national research laboratories and technology development centers, though many other organizations also take part in these processes. Academic institutions such as the Carnegie Mellon Electricity Industry Center and the Stanford University Program on Energy & Sustainable Development conduct research in association with national laboratories and federal agencies. Additionally, DOE finances or co-finances demonstration projects with industry, such as supporting carbon-capture and sequestration, next-generation nuclear reactors, renewable energy systems such as wind and solar, and energy efficient technologies in the transportation and building sector.

Though the current and historical DOE-based RDD&D programs center on US industries, technologies, and energy security, climate change challenges associated with the energy sector are clearly global issues, and attention is shifting toward a broader geographical focus. Future colloquia, likely to be held in autumn 2008, may address collaboration between nations to research, develop, demonstrate, and deploy low-carbon technologies in the US and other developed nations as well as in developing nations where much of the future greenhouse gas emissions are expected to originate. Other options include exploring the role of state governments' interactions with federal, industry, and academic RDD&D efforts. Though no formal set of policy recommendations will be issued, the outcomes of these colloquia will provide NCEP staff with guidance to shape both internal research efforts and strategies for creating effective R&D structures in future climate change legislation.

Low-Carbon Technology Pathways Project:

NCEP has undertaken a project to examine deployment of energy technologies which have the greatest potential to both lower greenhouse gas (GHG) emissions and provide for future energy needs, to assess costs and other constraints to deployment, and use the findings from this examination to inform policy recommendations which can support accelerated market penetration of these technologies and reduce greenhouse gas emissions from the energy sector overall. As with NCEP's Institutions and Mechanisms project described previously, the Low-Carbon Technology Pathways project is primarily concerned with US energy use and GHG emissions, and related industries and policy structures.

Technologies examined in this project are biofuels, renewable energy (wind, solar power, and biomass), advanced nuclear, carbon capture and sequestration (CCS), and energy efficiency in the transportation sector and the built environment. These technologies are very different in their likelihood of success, costs, potential to reduce greenhouse gas emissions, and in the policy contexts which govern their growth. These technologies face similar types of challenges to growing into larger roles in the marketplace, however.

This project examines economic barriers, resource, labor and infrastructure constraints, and social issues (such as lack of public awareness of energy efficient building systems or opposition to siting of new nuclear facilities). For each of the technology groups included in the project, NCEP will conduct background assessments characterizing the current stage of development (whether it be in the RDD&D stage as is the case with CCS, if it is commercially available as is the case with wind turbines, or somewhere in between) and assessing potential near- and medium-term advances or technological breakthroughs on the horizon.

The project will also assess costs associated with GHG emissions reductions for each technology and consider the possible competing cost pressures resulting from increased demand for resources, equipment, and trained labor. Finally, greater deployment of any of these technologies will be affected by policy and regulatory factors. Some may lack an adequate regulatory structure. Others may require additional policies beyond those related to carbon mitigation to become viable. The project will examine current policies and regulatory

structures for each technology, and identify areas where policy changes would aid more widespread deployment.

As part of an assessment of the potential for each of the technology groups, the project will seek input from expert judgment through a series of workshops, and utilize modeling to estimate GHG mitigation potential based on high- or low-deployment scenarios. The project will summarize the outcomes of the technology assessments, modeling, expert input, and cost estimates and synthesize these insights into a report near the end of 2008. After these steps in the project, NCEP will identify the most important barriers associated with each technology and develop policy options to address them.