

Appendix B: Charge to the Task Force on Sustainable Energy

NSB-07-121

October 3, 2007

Statutory Basis

“The Board shall render to the President and to the Congress reports on specific, individual policy matters related to science and engineering and education in science engineering, as the Board, the President, or the Congress determines the need for such reports.” (*42 U.S.C. Section 1863*) SEC. 4. (j) (2)

Action Recommended

The National Science Board (Board) will examine the role of the U.S. Government in addressing the science and engineering (S&E) challenges related to development of sustainable energy, and provide recommendations to the President and Congress regarding a nationally coordinated S&E research and education initiative on sustainable energy with specific guidance on the role of the National Science Foundation (NSF) in such an initiative.

Background

The interest of the National Science Board in sustainable energy was encouraged by President George W. Bush’s national call to action on energy with the announcement of the Advanced Energy Initiative in his January 31, 2006 State of the Union Address. The rapidly expanding literature warns of a number of threats from our Nation’s and the World’s reliance on fossil energy sources. These include:

- the economic and societal impacts of a rapidly growing global demand for energy and the increasing costs, both economic and environmental, of fossil fuel as the more easily accessible sources are depleted,
- the threat to national security and balance of trade as the U.S. and other countries, especially emerging economies, become increasingly dependent on a relatively few, often politically unstable, oil exporting nations, and
- the often cited threat of anthropogenic carbon loading in the atmosphere and its effects on the global climate and on human life.

These threats have given rise to a global call to move rapidly to a sustainable energy economy. However, most projections of trends for the next quarter to half century suggest little change in the future global energy mix without more concerted action. It is of concern that the scale and speed of the adoption of sustainable and clean energy technologies will be far short of that necessary to address the threats that will only become more acute with the passage of time. Of particular concern is the heavy dependence on fossil fuels for the transport sector and the carbon footprint that current and projected energy use represents.

Given the Board’s responsibility to advise the President and Congress on national policy matters relating to science and engineering, the Board arranged for three expert presentations on the scientific challenges related to the development of sustainable energy:

- *Energy from Biomass*, Chris Somerville, Professor of Biological Sciences, Stanford University, September, 2006;

- *Scientific Challenges in the Development of Sustainable Energy*, Nathan S. Lewis, Professor of Chemistry at Caltech, November, 2006; and
- *Transformational Science for Energy and the Environment*, Raymond L. Orbach, Under Secretary for Science, U.S. Department of Energy, March, 2007.

The Board is also mindful of President Bush's challenge to the nation in his 2007 State of the Union Address: *"America is on the verge of technological breakthroughs that will enable us to live our lives less dependent on oil. And, these technologies will help us be better stewards of the environment, and they will help us to confront the serious challenge of global climate change."*

These presentations and the President's challenge energized the Board regarding the immediacy of the need to develop sustainable energy sources that would lessen the dependence on increasingly difficult to access fossil fuels and decrease the rate of atmospheric carbon loading. Given the vital strategic importance of energy use in carrying out the missions of most government agencies, the Board believes it to be an imperative for the long-term prosperity of this Nation for the government to develop a long-term, coordinated, inter-agency strategy to achieve a stable sustainable U.S. energy future. Such an approach will require that the attributes of a sustainable energy economy be defined and that all technology options be weighed and evaluated against their ability to meet these attributes. Further, this would need to be done in a global context. The Board is uniquely suited to make recommendations regarding the S&E research and education challenges in developing such a nationally coordinated strategy, with specific guidance to NSF on its role in this effort. The Board's Committee on Programs and Plans (CPP) should establish a formal Task Force on Sustainable Energy to lead this Board effort.

Policy Objectives

The following issues will be analyzed and discussed by the Task Force before constructive policy recommendations and a proposed strategy is recommended to CPP and the full Board consistent with the Board's statutory charge.

- Examine existing S&E sustainable energy research and education policies and efforts at the NSF, the Federal Government and U.S. corporations, and around the world in scope, scale, time frame, and in the context of national and global challenges.
- Develop recommendations for the Board to consider with respect to a nationally coordinated S&E research and education initiative on sustainable energy.
- Provide explicit guidance on NSF's role with respect to basic research and education in the overall national effort.

Based upon the work of this Task Force, the Board will then provide policy guidance to NSF, and broader recommendations to the Administration and Congress relative to a long-term coordinated inter-agency strategy for the development of sustainable U.S. energy production in light of President Bush's challenge to be better stewards of the environment.

Logistics

Once the Task Force has completed its initial analysis of existing policies and efforts, the Task Force will bring together representatives of NSF, academe, private sector industry and investors, NGOs, and other pertinent U.S. Federal agencies involved in energy, as well as members of the broader scientific community, through a series of workshops to examine, discuss and address the issues identified above. The Task Force will have the ability to convene such working groups as it deems

necessary to obtain additional relevant information as well as to frame recommended strategies. It is anticipated that the Task Force will produce a final report that summarizes its findings and presents recommendations regarding the role of the U.S. Government in addressing S&E challenges related to development of sustainable energy, with specific recommendations for the NSF role in a national S&E research and education initiative on sustainable energy. Printed copies of a final Board report will be widely distributed and available on the Board Web site for the general public, universities, Congress, various special interest groups, and the broad scientific community. In addition, a regular and pro-active outreach effort to communicate task force activities will be implemented throughout the duration of the Task Force life. The Task Force expects to present a draft report to the Board in 12 months, and conclude its activities within 18 months, from the date that formation of the Task Force is approved. The Board Office will serve as the focal point for coordination and implementation of all Task Force activities.

