

PROCESS FOR PRODUCING THE REPORT

The National Science Board Task Force on National Workforce Policies for Science and Engineering, reporting through the Committee on Education and Human Resources, was established in October 2000. Its charge was to assess long-term national workforce trends and needs in science and engineering and their relationship to existing Federal policies and to recommend policy directions that address long-term S&E workforce needs. In response to the charge and to better inform recommendations, the task force initiated an extensive examination of existing data, policy documents, and expert opinion.

A data briefing, held on January 30, 2001 (see agenda, Appendix II), provided expert testimony from the following:

- Bureau of Labor Statistics covering databases on occupations and employment maintained by the various surveys of the bureau;
- NSF Division of Science Resources Statistics on the three surveys that constitute NSF's Scientists and Engineers Statistical Data System;
- US Department of Education's Office of Educational Research and Improvement concerning the information technology workforce and certification programs;
- Institute for the Study of International Migration at Georgetown University on information sources concerning migration of S&E students and workers to the US; and
- The University of Phoenix, Council of Graduate Schools, and Alfred P. Sloan Foundation concerning university perspectives on approaches to degree programs, skills certification, and response to market demand.

In order to better understand policy issues concerning the flow of foreign S&E workers to the United States, the task force commissioned a report, "State of Knowledge on the Flow of Foreign Science and Technology Workers to the United States," by Dr. B. Lindsay Lowell of the Institute for the Study of International Migration at Georgetown University (see Executive Summary of his report, Appendix V).

Task force meetings featured expert testimony from NSF staff on teacher preparation and professional development, national data on teachers, and NSF data on mid-career training and education of S&E professionals. For information on issues at the State level, the task force was briefed on the critical path analysis of California's S&E education system by the Executive Director of the California Council on Science and Technology.

The task force held a workshop in March 2002 on national policies addressing the US education system and approaches to achieve increased numbers of well-prepared associate and baccalaureate degree recipients (see agenda, Appendix III). Presentations and discussion by leaders in the field focused on policy options in the following areas:

- The transition from precollege to undergraduate study;
- Multiple pathways to the workforce and mobility of students among various educational offerings;
- The system for teacher preparation and certification and the interplay with other career options;
- State-level policies on science and technology education;
- Incentives to increase the supply of college graduates;

Diversity and student development;
Institutional strategies and their impacts on undergraduate students.

The task force held a workshop in June 2002 concerning the interplay between the international character of the advanced science and engineering workforce and national needs (see agenda in Appendix IV). Dr. John Marburger, Director, Office of Science and Technology Policy, Executive Office of the President, addressed the workshop. Experts from industry, government, academia, and professional societies explored needs and policies across the following areas:

Employment serving the US government;
US corporations and their workforce needs;
The impact of security policies on the S&E workforce;
Policies and approaches in other countries;
US policies and regulations affecting international graduate students and postdoctoral researchers;
Factors affecting the choice of domestic students to attend graduate school.

The task force contracted with SRI International for a comprehensive literature review that identified and summarized studies with policy recommendations relevant to the S&E workforce (see bibliography, Appendix VII).

The National Science Board approved a draft report of the Task Force on National Workforce Policies for Science and Engineering for public comment at its May 22, 2003 meeting. The report was posted on the NSB web page on May 30, with a request for comments by July 1, 2003. An outreach effort was undertaken to encourage comment. All comments were reviewed by the task force and the Committee on Education and Human Resources. A revised draft reflecting comments was considered by the full Board and approved for publication at the August 14 NSB meeting. Names of those submitting written comments are listed in Appendix VI, unless anonymity was requested.

Box A:

DEFINING THE SCIENCE AND ENGINEERING WORKFORCE

There are a number of definitions for the science and engineering workforce. The most common is to count those in occupations classified as science and engineering positions. However, this approach fails to identify those with skills in science and engineering used in non-S&E occupations—for example, in technical management. The task force has focused on the availability of skills, in view of the fluid nature of the science and engineering workforce—with members capable of employment in a number of kinds of occupations over the course of their careers. In this definition, a precollege teacher with a baccalaureate or the equivalent in a field of science, mathematics or engineering is a member of the science and engineering workforce. Also included are practitioners with two-year degrees and certificates in science, engineering and technology fields. Further, doctoral level scientists in postdoctoral positions form a vital and growing component of the US S&E workforce in some fields of research, notably nowadays in biomedicine.

This approach appears to be more in keeping with how degree holders view themselves. For those with science and engineering baccalaureates or higher-level degrees in the workforce in 1999, 67 percent in occupations not formally classified as S&E jobs stated that their jobs were at least somewhat related to their highest S&E degree field. In 1999 there were 10.5 million S&E degree holders at the baccalaureate level or above in the workforce. For the purposes of this study, this group along with those with associate degrees in science and engineering are considered the qualified pool of scientists and engineers. (See SEI-2002, “Who is a Scientist or Engineer?” 3-5)