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FOR IMMEDIATE RELEASE

Broad Federal Effort Urgently Needed to Create New, High-Quality Jobs for All Americans in the 21st Century

WASHINGTON -- The unmatched vitality of the United States' economy and science and technology enterprise has made this country a world leader for decades, allowing Americans to benefit from a high standard of living and national security. But in a world where advanced knowledge is widespread and low-cost labor is readily available, U.S. advantages in the marketplace and in science and technology have begun to erode. A comprehensive and coordinated federal effort is urgently needed to bolster U.S. competitiveness and pre-eminence in these areas so that the nation will consistently gain from the opportunities offered by rapid globalization, says a new report from the National Academies.

Given the United States' history of economic and scientific pre-eminence, it is easy to be complacent about these complex issues, the report says. Following are some indicators that illustrate why decisive action is needed now:

• For the cost of one chemist or one engineer in the United States, a company can hire about five chemists in China or 11 engineers in India.

• Last year chemical companies shuttered 70 facilities in the United States and have tagged 40 more for closure. Of 120 chemical plants being built around the world with price tags of $1 billion or more, one is in the United States and 50 are in China.

• U.S. 12th-graders recently performed below the international average for 21 countries on a test of general knowledge in mathematics and science. In addition, an advanced mathematics assessment was administered to students in 15 other countries who were taking or had taken advanced math courses, and to U.S. students who were taking or had taken pre-calculus, calculus, or Advanced Placement calculus. Eleven countries outperformed the United States, and four scored similarly. None scored significantly below the United States.

• In 1999 only 41 percent of U.S. eighth-graders had a math teacher who had majored in mathematics at the undergraduate or graduate level or studied the subject for teacher certification -- a figure that was considerably lower than the international average of 71 percent.
• Last year more than 600,000 engineers graduated from institutions of higher education in China. In India, the figure was 350,000. In America, it was about 70,000.

• In 2001 U.S. industry spent more on tort litigation than on research and development.

Without a major push to strengthen the foundations of America's competitiveness, the United States could soon lose its privileged position. The ultimate goal is to create new, high-quality jobs for all citizens by developing new industries that stem from the ideas of exceptional scientists and engineers.

The congressionally requested report -- written by a 20-member committee that included university presidents, CEOs, Nobel Prize winners, and former presidential appointees -- makes four recommendations along with 20 implementation actions that federal policy-makers should take to create high-quality jobs and focus new science and technology (S&T) efforts on meeting the nation's need for clean, affordable, and reliable energy. Some actions will involve changing existing laws, while others will require financial support that would come from reallocating existing budgets or increasing them. The committee believes that ongoing evaluation of the results should be included in all of the measures.

"America must act now to preserve its strategic and economic security by capitalizing on its knowledge-based resources, particularly in S&T, and maintaining the most fertile environment for new and revitalized industries that create well-paying jobs," said committee chair Norman R. Augustine, retired chairman and CEO of Lockheed Martin Corp., Bethesda, Md. "The building blocks of our economic leadership are wearing away. The challenges that America faces are immense."

A brief overview of the four recommendations follows, with a sample of proposed actions to implement them.

Ten Thousand Teachers, Ten Million Minds

Increase America's talent pool by vastly improving K-12 mathematics and science education.

• Among the recommended implementation steps is the creation of a merit-based scholarship program to attract 10,000 exceptional students to math and science teaching careers each year. Four-year scholarships, worth up to $20,000 annually, should be designed to help some of the nation's top students obtain bachelor's degrees in physical or life sciences, engineering, or mathematics -- with concurrent certification as K-12 math and science teachers. After graduation, they would be required to work for at least five years in public schools. Participants who teach in disadvantaged inner-city or rural areas would receive a $10,000 annual bonus. Each of the 10,000 teachers would serve about 1,000 students over the course of a teaching career, having an impact on 10 million minds, the report says.

Sowing the Seeds

Sustain and strengthen the nation's commitment to long-term basic research.

• Policy-makers should increase the national investment in basic research by 10 percent each year over the next seven years. Special attention should be paid to the physical sciences, engineering, mathematics, and information sciences, and to basic research funding for the U.S. Department of Defense, the report says.

• Policy-makers also should establish within the U.S. Department of Energy an organization called the Advanced Research Project Agency -- Energy (ARPA-E) that reports to the undersecretary for science and sponsors "out-of-the-box" energy research to meet the nation's long-term energy challenges.

• Authorities should make 200 new research grants annually -- worth $500,000 each, payable over five years -- to the nation's most outstanding early-career researchers.

Best and Brightest

Develop, recruit, and retain top students, scientists, and engineers from both the United States and abroad. The United States should be considered the most attractive setting in the world to study and conduct research, the report says.

• Each year, policy-makers should provide 25,000 new, competitive four-year undergraduate scholarships and 5,000 new graduate fellowships to U.S. citizens enrolled in physical science, life science, engineering, and mathematics programs at U.S. colleges and universities.

• Policy-makers should provide a one-year automatic visa extension that allows international students to remain in the United States to seek employment if they have received doctorates or the equivalent in science, technology, engineering, mathematics, or other fields of national need from qualified U.S. institutions. If these students then receive job offers from employers that are based in the United States and pass a security screening test, they should automatically get work permits and expedited residence status. If they cannot obtain employment within one year, their visas should expire.

Incentives for Innovation

Ensure that the United States is the premier place in the world for innovation. This can be accomplished by actions such as modernizing the U.S. patent system, realigning tax policies to encourage innovation, and ensuring affordable broadband Internet access, the report says.

• Policy-makers should provide tax incentives for innovation that is based in the United States. The Council of Economic Advisers and the Congressional Budget Office should conduct a comprehensive analysis to examine how the United States compares with other nations as a location for innovation and related activities, with the goal of ensuring that the nation is one of the most attractive places in the world for long-term investment in such efforts.

• The Research and Experimentation Tax Credit is currently for companies that increase their R&D spending above a predetermined level. To encourage private investment in innovation, this credit, which is scheduled to expire in December, should be made permanent. And Congress and the administration should increase the allowable credit from 20 percent to 40 percent of qualifying R&D investments.

The study was sponsored by the National Academies, which comprise the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council. They are private, nonprofit institutions

that provide science, technology, and health policy advice under a congressional charter. A committee roster follows.

Copies of **Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future** will be available this fall from the National Academies Press; tel. 202-334-3313 or 1-800-624-6242 or on the Internet at **http://www.nap.edu**. Reporters may obtain a pre-publication copy from the Office of News and Public Information (contacts listed above).

[This news release and report are available at **http://national-academies.org**]

THE NATIONAL ACADEMIES
Committee on Science, Engineering, and Public Policy

Committee on Prospering in the Global Economy of the 21st Century

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