



Further investments in S&T vital to U.S. economic competitiveness

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A recently released report, “Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5,” highlights progress that has been made in the past five years, including enactment of the America COMPETES Act, but underscores that the United States’ competitive position in the world now faces greater challenges and that research investments are even more critical now. The report, requested by the presidents of the National Academies and authored by members of the committee that wrote the 2005 report “Rising Above the Gathering Storm: Energizing and Employing America for a Brighter

Economic Future,” urges reauthorization of COMPETES.

What progress has been made in addressing U.S. competitiveness challenges came largely as the result of the America COMPETES Act and stimulus package spending advancing its provisions, but both are due to expire soon, warned authors of the new report.

“The Gathering Storm effort once again finds itself at a tipping point,” said Norman R. Augustine, one of the new report’s authors and chair of the original “Gathering Storm” committee. “Addressing America’s competitiveness challenge is an undertaking that will re-



quire many years, if not decades,” he said. The new report assesses changes in the United States’ competitive status since the release of “Gathering Storm” and the degree to which its recommendations have been implemented.

The report’s authors concluded that the country’s competitive outlook has worsened since 2005, when “Gathering Storm” issued its call to strengthen K–12 education and double the federal basic-research budget. While progress has been made in certain areas, the latitude to fix the problems being confronted has been severely diminished by the economic recession and the growth of the national debt over this period from \$8 trillion to \$13 trillion, the report said. Moreover, other countries have been markedly progressing, thereby affecting the United States’ relative ability to compete for new factories, research laboratories, and jobs.

The report identifies many indications that the United States’ competitive capacity is slipping, including the following:

- In 2009, 51% of U.S. patents were awarded to non-U.S. companies.
- China has replaced the United States as the world’s number one high-technology exporter and is now second in the world in publication of biomedical research articles.
- Between 1996 and 1999, 157 new drugs were approved in the United States. In a corresponding



National Academies Committee members participating in “The Gathering Storm, Revisited” testified at the House Committee on Science and Technology on September 29, 2010 to encourage reauthorization of the America COMPETES Act: (left to right) Norman R. Augustine (Chair of the National Academies Committee and retired Chair and CEO of the Lockheed Martin), Craig Barrett (retired Chair and CEO of Intel), Charles Holliday Jr. (Chair of the Board of Bank of America), and C.D. Mote Jr. (President Emeritus of the University of Maryland).

period 10 years later, the number dropped to 74.

- Almost one-third of U.S. manufacturing companies responding to a recent survey say they are suffering from some level of skills shortage.

In addition, despite occasional bright spots, the country's education system has shown little sign of improvement, particularly in math and science, the report said. According to the ACT College Readiness Report, 78% of U.S. high school graduates in 2008 did not meet readiness benchmark levels for one or more entry-level college courses in mathematics, science, reading, and English, the report said. And the World Economic Forum ranks the United States 48th in the quality of its math and science education.

In 2007, Congress passed the America COMPETES Act, which authorized many recommendations from the "Gathering Storm" report. But most of the Act's measures went unfunded until the stimulus package was passed early in 2009, a package that increased total federal funding for K-12 education, provided scholarships for future math and science teachers, and funded the Advanced Research Projects Agency-Energy, which is dedicated to

supporting transformational basic research on energy.

However, the America COMPETES Act is set to expire this year, and its funding—which came from the stimulus package, presumed to be a one-time initiative—is also nearing expiration. In order to sustain the progress that has begun, the report said, it will be necessary to both reauthorize the America COMPETES Act and "institutionalize" oversight and funding of "Gathering Storm" recommendations—or others that accomplish the same purpose—so that funding and policy changes will routinely be considered in future years' legislative processes.

The report's authors acknowledged the difficulty of carrying out the "Gathering Storm" recommendations, such as doubling the research budget, in the current fiscal environment. But such investments will need to be made if the country is to maintain the economic strength to provide health care, social security, national security, and other basic services to its citizens, they said.

During a hearing held in September at the House of Representatives Committee on Science and Technology, Augustine, who is also former chair and CEO of Lockheed Martin, said, "For many years,

I worked as an aircraft engineer and we often dealt with the dilemma of trying to make an overweight aircraft fly. We never solved the problem by removing an engine. Science funding is the engine of a thought-based economy. We cannot simply remove it."

Charles Holliday, also a member of the Gathering Storm Committee and Chair of the Board of Bank of America, testified at the hearing, "The Advanced Research Projects Agency-Energy (ARPA-E) has challenged innovators to come up with truly novel ideas and 'game changers.' The program has high potential for long-term success, but only if it is given the autonomy, budget, and clear signals of support to implement needed projects."

During the hearing, House committee chair Bart Gordon (D-Tenn.) said, "I am hopeful that the COMPETES reauthorization bill will be enacted by the end of the year, and that Congress will have once again answered this call to action."

For copies of the report, contact the National Academies Press; tel. 202-334-3313 or 1-800-624-6242 or on the Internet at www.nap.edu.

Titanium center to drive economic growth in New Zealand

The new Applied Powder Metallurgy Centre at the Bay of Plenty Polytechnic will be the innovative hub of New Zealand's emerging titanium industry, said Research, Science and Technology Minister Wayne Mapp.

Mapp said the center, which opened in July, will enable New Zealand to gain a competitive advantage in an emerging technology.

"It is a key piece of infrastructure for the titanium industry. It will significantly boost New Zealand's advantage in the industry, especially in titanium powder technology. The titanium applications industry could be worth \$700 million each year to New Zealand by 2020.

"The government has put nearly \$8 million into research and development of the titanium industry, through New Zealand Trade and Enterprise, the Ministry of Economic Development and TechNZ," he said.

"This new center exemplifies the government's science goals. Supporting innovation was a top priority in the 2010 budget. We allocated \$234 million over four years for business research and development, to be targeted at highly innovative companies," Mapp said.

"This facility is unique in New Zealand. It combines traditional and high-tech engineering. Companies can use it to turn ideas and technology into leading-

edge products. The opening of this center is an excellent example of the innovative ecosystem at work. The industry, the Bay of Plenty Polytechnic, and the University of Waikato have pooled their resources to make this happen. It is exactly the sort of innovative project that will drive our economic growth," the Minister said. □



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