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President's Council of Advisors on Science and Technology Releases Report on Advanced Manufacturing

President Launches Advanced Manufacturing Partnership, a Key Recommendation

The Nation should launch a major advanced manufacturing initiative that engages industry and academia to help accelerate the development of potentially transformative products and emerging technologies, according to a new report by the President's Council of Advisors on Science and Technology (PCAST)—an independent council of 21 of the Nation's leading scientists and engineers appointed by the President to advise him. [*Report to the President on Ensuring American Leadership in Advanced Manufacturing*](#) provides an overarching strategy as well as specific recommendations for revitalizing the Nation's leadership in advanced manufacturing.

In response to the report, President Obama today announced the creation of an Advanced Manufacturing Partnership, to be spearheaded by leaders from top engineering universities and several major U.S. manufacturers. The President also directed the National Economic Council, and the Office of Science and Technology Policy to work closely with the new Partnership to implement a number of the PCAST report's recommendations, including that the Federal government:

- Invest in shared infrastructure facilities, including Federal and university laboratories, which could be easily accessed by small and medium-sized firms and would facilitate significant productivity gains by allowing those companies to rapidly prototype, customize, test and produce new products;
- Support the development of advanced manufacturing processes that cut across multiple industry sectors and could be used by an array of companies to dramatically reduce product development time and increase entrepreneurs' ability engage in design and transition their inventions into products made in the United States; and
- Participate in partnerships with industry and academia that identify and invest in broadly-applicable, precompetitive, emerging technologies—such as nanomanufacturing flexible

electronics, information technology-enabled manufacturing, and advanced materials—that have the potential to transform the manufacturing sector.

“The United States has been the world leader in bringing advanced technologies from initial conception to commercialization,” said PCAST Co-Chair Eric S. Lander. “A powerful partnership among academia, industry, and government has driven this success, especially at the early stages when no one player can bear the full costs of pioneering new technologies. We need to renew and extend this American partnership, especially as other nations are increasingly trying to beat us at our own model.”

Advanced manufacturing involves the manufacture of conventional or novel products through processes that depend on the coordination of information, automation, computation, software, sensing, and networking, and/or make use of cutting edge materials and emerging scientific capabilities. The new report, produced by PCAST in its capacity as the President’s Innovation and Technology Advisory Committee (PITAC), concludes that by investing strategically in this fast-moving field the United States can regain its now-challenged status as a global leader in manufacturing. Such a strategy, the report concludes, would yield high-paying jobs, support domestic innovation, and bolster national security.

Manufacturing has been declining as a share of U.S. GDP and employment, and the loss of U.S. leadership in this domain has not been limited to low-wage jobs in low-tech, conventional industries; the United States is also trailing in high-tech industries that employ highly-skilled workers. The U.S. trade balance in advanced technology manufactured products shifted from surplus to deficit starting in 2001, according to PCAST.

There are three compelling reasons why the United States should strive to revitalize its leadership in manufacturing, and in particular advanced manufacturing, PCAST concludes:

- 1. Jobs:** Manufacturing that is based on new technologies, including high-precision tools and advanced materials, can provide high-quality, good-paying jobs for American workers.
- 2. Innovation:** It is not enough to invent in America and manufacture abroad. By keeping manufacturing local, a number of synergies ensue through which the design, engineering, scale-up, and production processes feed back on the conception and innovation sectors to generate new ideas and novel second- and third-generation products.
- 3. Security:** Domestic manufacturing capabilities using advanced technologies and techniques are vital to maintaining national security.

“Being the best in the world in scientific discoveries is vital to our success as a nation, but it is not enough. If we fail to secure a strong foundation for advanced manufacturing here at home, we risk losing our ability to innovate next-generation products,” said PCAST member and PITAC Co-Chair Shirley Ann Jackson. “Building this essential advanced manufacturing infrastructure requires the kind of committed collaboration among industry, government, and academia that President Obama has called for today.”

The PCAST report concludes that what America needs to regain its leadership in manufacturing is not an **industrial policy**, in which government invests in particular companies or sectors, but rather a coherent **innovation policy** in which government not only supports sustained investment in **basic** research to promote scientific discoveries, but also co-invests in precompetitive **applied** research to accelerate the maturation and manufacturing-readiness of emerging technologies.

Private investment must be complemented by public investment, the report adds, because individual companies cannot justify the investment required to fully develop many important new technologies or to create the full infrastructure to support advanced manufacturing. The report outlines criteria that the Federal government should apply when co-investing to support the development of key technologies and points to a number of successful models in other countries, such as Germany's Fraunhofer Institutes, which provide infrastructure facilities and resources for joint use by public and private entities.

In addition to the Advanced Manufacturing Initiative, the PCAST report calls for changes in tax and business policies, including a permanent extension of the R&D tax credit; continued strong support for basic research in addition to the new emphasis on public-private partnerships to support pre-competitive applied research; and enhanced support for training and educational activities to create a more highly skilled workforce.

“America's global competitiveness would greatly benefit from investing in America's children to ensure their technological savviness and STEM education proficiency; permanency of the R&D tax credit to enable long-term investment in innovation by US companies; and immigration reform that allows the United States to attract, hire, and retain the best and the brightest wherever they come from,” said Eric Schmidt, PCAST member and PITAC Co-Chair.

PCAST is an advisory group that makes policy recommendations in the many areas where understanding of science, technology, and innovation is key to strengthening our economy and forming policies that work for the American people. *Report to the President on Ensuring American Leadership in Advanced Manufacturing* was developed by PCAST in response to a request from the President. Over a period of several months, PCAST gathered information from experts in industry, academia, government agencies, and nongovernmental organizations via a workshop and a Web-based system for stakeholder input.

For more about PCAST, and to view the full report, please visit: www.whitehouse.gov/ostp/pcast