



POSITION STATEMENT

U.S. HIGH-VALUE JOB GROWTH THROUGH MANUFACTURING INNOVATION

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For the United States to remain vibrant as a global economic and technological leader, it must preserve and grow the manufacturing sector. The United States' strength in national security, economic security, and its ability to create wealth and new jobs depends upon a robust and adaptive domestic manufacturing industry.

To accomplish these objectives, IEEE-USA recommends that federal, state and local governments:

- Legislate to provide access for small- and medium-sized manufacturers to the resources necessary to make investments and upgrades--for example, using low interest loans, tax incentives, SBIR programs, or matching grants
- Encourage public-private partnerships to invest in the developing technology for product sectors, where opportunities exist to create capital intensive manufacturing jobs with high productivity levels
- Direct government agencies to coordinate their activities to maximize synergy and minimize overlap
- Develop metrics to quantify the value added, by using programs supporting manufacturing research and development
- Legislate incentives for U.S. companies to innovate, and turn new concepts into onshore manufacturing operations
- Support manufacturing R&D programs in the United States, such as NIST's Manufacturing Extension Partnership, the Technology Innovation Program, and the National Network of Manufacturing Innovation--to ensure that new manufacturing technologies and design methodologies are developed in the United States

This statement was developed by the IEEE-USA Research & Development Policy Committee and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good, and promotes the careers and public policy interests of more than 205,000 engineers, scientists and allied professionals, who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE, or its other organizational units.

BACKGROUND

Each year, the U.S. manufacturing sector generates more than \$1.8 trillion worth of goods. The United States exports more than \$1 trillion of manufactured products to 236 countries, and provides an estimated 17.2 million jobs in the United States—about one in six private-sector jobs.¹ Manufacturing also accounts for \$190 billion of the research and development in the U.S. economy; these funds support two-thirds of private sector research and development (R&D) that employs scientists, engineers, and technicians to invent and produce new products.^{1,2} No other sector creates more high- paying jobs that sustain a vast swath of American households.

The United States needs a vision for generating high-value jobs, including goals and metrics for traditional and environmentally-friendly manufacturing success. There are many examples of materials and product technologies that were innovated in the United States, but most of the significant commercial market share they enabled was lost to other countries. They include rechargeable lithium-ion batteries, oxide ceramics, semiconductor memory devices--and manufacturing equipment-- such as wafer steppers, flat panel displays, robotics, solar cells and advanced lighting.¹ Leadership in frontier research and new process technologies is essential for job growth through manufacturing and innovation here in the United States.

References:

1. For general information on manufacturing trends and the importance of manufacturing to the U.S. economy, see:

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- *2013 Global Manufacturing Competitiveness Index*, Council on Competitiveness (Deloitte Study), November 2012. On-line at: <http://www.compete.org/publications/detail/2435/2013-global-manufacturing-competitiveness-index/>
- *Ignite 2.0: Voices of American University Presidents and National Lab Directors on Manufacturing Competitiveness*, Council on Competitiveness, June 2011. On-line at: <http://www.compete.org/publications/detail/1731/ignite-2.0/>
- *A Manufacturing Renaissance: Four Goals for Economic Growth*, National Association of Manufacturers, June 2010. On-line at: <http://www.nam.org/~media/AF4039988F9241C09218152A709CD06D.ashx>

- *Report to the President on Ensuring U.S. Leadership in Advanced Manufacturing*, President's Council of Advisors on Science and Technology, Executive Office of the President, June 2011. On-line at:
[3http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-advancedmanufacturing-june2011.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-advancedmanufacturing-june2011.pdf)
- *Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing*, President's Council of Advisors on Science and Technology Executive Office of the President, July 2012. On-line at:
http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_amp_steering_committee_report_final_july_27_2012.pdf
- *National Network for Manufacturing Innovation: A Preliminary Design*, National Science and Technology Council, Executive Office of the President, Advanced Manufacturing National Program Office, January 2013. On-line at:
http://manufacturing.gov/docs/NNMI_prelim_design.pdf
- *MIT Production in the Innovation Economy*, Commission PIE Task Force, "Achieving an innovation nation," September 2013.
<http://newsoffice.mit.edu/2013/mit-pie-conference-0924>

2. U.S. Business Report 2008, *Worldwide R&D Expense of \$330 Billion: Findings from the New National Science Foundation Survey*, National Science Foundation, Info Brief, May 2010
<http://www.nsf.gov/statistics/infbrief/nsf10322/nsf10322.pdf>