U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY

Building a Network for Manufacturing Innovation

Thursday, December 12, 2013
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On Thursday, December 12, the Subcommittee on Research and Technology will hold a hearing to examine the need for a manufacturing innovation network and to review H.R. 2996, the "Revitalize American Manufacturing and Innovation Act of 2013," sponsored by Representatives Tom Reed (R-NY) and Joe Kennedy (D-MA).

Witnesses

Panel I

- **The Honorable Tom Reed**, Member, U.S. House of Representatives
- **The Honorable Joseph P. Kennedy, III**, Member, U.S. House of Representatives

Panel II

- **Mr. Jonathan Davis**, Global Vice President of Advocacy, SEMI
- **Dr. Richard A. Aubrecht**, Vice Chairman of the Board, Vice President, Strategy & Technology, Moog Inc.
- **Dr. Stephan Biller**, Chief Scientist Manufacturing Technology, GE Global Research
- **Dr. Stan A. Veuger**, Resident Scholar, American Enterprise Institute for Public Policy Research

Background

Manufacturing has been a significant part of American productivity since the industrial revolution. Manufacturing's share of gross domestic product is approximately 11 percent, and manufacturing output has risen by 13 percent in the last several years. However, employment in the manufacturing sector as a share of the economy is significantly lower than in the post-World War II era. Despite some modest increases recently,[1,2] American manufacturing has seen large employment declines since 2000.[3] Some reports have cited declines in manufacturing employment as an indicator of a decrease in U.S. economic competitiveness,[4] while others suggest that declines are primarily attributed to increases in productivity.[5]

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[1] Made in America, Again, August 2011, Boston Consulting Group.
[2] Manufacturing's Secret Shift: Gaining Competitive Advantage by Getting Closer to the Customer; March 2011, Accenture
[3] Bureau of Labor Statistics, http://www.bls.gov/data/.
[4] S. Ezell and R. Atkinson, "The Case for a National Manufacturing Strategy," April, 2011, The Information Technology and Innovation Foundation. http://www.itif.org/files/2011-national-manufacturing-strategy.pdf
[5] Council on Competitiveness Report, Make: An American Manufacturing Movement, December 2011, http://www.compete.org/publications/detail/2064/make/

Most analysts agree that manufacturing continues to be an important part of the American economy. Manufacturing is generally more research and development intensive than other sectors of the economy,[6] and therefore more closely tied to the nation's innovative capacity.[7] However, stakeholders express a variety of opinions on the appropriate prescription to maintain or strengthen the American manufacturing sector.

National Institute of Standards and Technology

The National Institute of Standards and Technology (NIST) is a non-regulatory agency within the Department of Commerce. Originally founded in 1901 as the National Bureau of Standards, NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life. By working closely alongside industry, NIST has become recognized as a provider of high-quality information utilized by the private sector.

NIST supports U.S. manufacturing through a combination of measurement science research programs conducted through NIST Scientific and Technical Research Services and through extramural manufacturing programs, including the Manufacturing Extension Partnership and the Advanced Manufacturing Technology Consortia Program.

Scientific and Technical Research and Services

NIST currently operates six laboratory units, under the Scientific and Technical Research and Services (STRS) line in the budget, which conduct research and development for measurement science, standards, and technology. Research at the NIST laboratories is intended to advance the agency's mission of promoting US innovation and industrial competitiveness by developing and supplying test methods, measurement tools and know-how, and scientific data that are embedded in the processes, products and services of nearly every U.S. manufacturing industry, as well as the nation's service sector. NIST STRS is funded at $579.8 million for Fiscal Year 2013.

Manufacturing Extension Partnership

NIST's Hollings Manufacturing Extension Partnership (MEP) works with small and mid-sized U.S. manufacturers to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from innovation strategies to process improvements to green manufacturing. MEP also works with partners at the state and federal levels on programs that put manufacturers in position to develop new customers, expand into new markets and create new products. MEP provides resources in five key areas: technology acceleration, supplier development, sustainability, workforce and continuous improvement. MEP was funded at $119.4 million for Fiscal Year 2013.

Advanced Manufacturing Technology Consortia Program

[6] *OECD Science, Technology and R&D Statistics* http://www.oecd-ilibrary.org/content/data/data-00183-en
[7] S. Ezell and R. Atkinson, "The Case for a National Manufacturing Strategy," April, 2011, The Information Technology and Innovation Foundation. http://www.itif.org/files/2011-national-manufacturing-strategy.pdf

The Advanced Manufacturing Technology Consortia (AMTech) Program, initially proposed by the Administration in the FY 2012 budget without explicit legislative authorization, is designed to incentivize the formation of and provide resources to industry-led consortia that will support basic and applied research on long-term, pre-competitive and enabling technology development for the U.S. manufacturing industry. The objective of AMTech is to establish and strengthen technology consortia, driven by industry, to identify and prioritize research projects addressing long-term U.S. industrial research needs. AMTech received initial funding of $14.2 million for Fiscal Year 2013.

Advanced Manufacturing National Program Office

In June 2011, the Administration launched the Advanced Manufacturing National Program Office (AMNPO), an interagency office that includes the Department of Commerce (through NIST), the Department of Defense, the Department of Energy, NASA and the National Science Foundation. The AMNPO does not have its own line item in the budget, but rather is supported through participant agency appropriations.

Housed at NIST, the AMNPO is intended to provide coordination of federal advanced manufacturing activities. It is tasked with identifying opportunities for investments in R&D, precompetitive collaboration, and shared infrastructure to support U.S. manufacturing. It is also intended to build links to technology and innovation partnerships involving U.S. manufacturers, universities, state and local governments, and other organizations.

The National Network for Manufacturing Innovation (NNMI)

The President's FY13 and FY14 budget requests included a proposal for a one-time mandatory fund of $1 billion to establish the National Network for Manufacturing Innovation, a public-private partnership of competitively-selected institutes that would each concentrate on a particular area of advanced manufacturing technology development. According to background information provided by the Administration, the goal of the institutes is to "bring together industry, universities and community colleges, federal agencies, and regional and state organizations to accelerate innovation by investing in industrially relevant manufacturing technologies with broad applications, and to support manufacturing technology commercialization by bridging the gap between the laboratory and the market."[8]

The Administration envisions the NNMI to be the foundation of a U.S. innovation infrastructure of linked regional hubs of manufacturing excellence. The NNMI also includes an emphasis on education and workforce development in advanced manufacturing skills. The Administration proposes up to 15 institutes across the country, with the federal support to last 5-7 years. The Committee on Science, Space and Technology held a hearing (http://science.house.gov/hearing/technology-and-innovation-subcommittee-hearing-assembling-facts-examining-proposed-national) to review the Administration's NNMI proposal in the 112th Congress.

In August 2012, the Administration announced a pilot manufacturing institute, the "National Additive Manufacturing Innovation Institute (NAMII)," based in Youngstown, Ohio to

[8] National Network for Manufacturing Innovation http://www.manufacturing.gov/amp/nnmi.html

accelerate and integrate additive manufacturing technologies to the U.S. manufacturing sector and to increase domestic manufacturing competitiveness. The pilot institute was established by reprogramming $30 million in appropriations for the Department of Defense (DOD), the Department of Energy (DOE), NASA, NSF and other federal agencies. In the 2013 State of the Union Address, the President announced plans for three additional manufacturing institutes to be funded through DOD and DOE appropriations.

H.R. 2996, "The Revitalize American Manufacturing and Innovation Act of 2013."

In early August, Rep. Tom Reed (NY) and Rep. Joe Kennedy (MA) introduced H.R. 2996, the "Revitalize American Manufacturing and Innovation Act of 2013," (http://congress.gov/cgi-lis/query/z?c113:H.R.2996:) to authorize the creation of a Network for Manufacturing Innovation Program, based on the President's NNMI proposal. H.R. 2996 would authorize $600 million instead of $1 billion as requested in the President's proposal. Sen. Sherrod Brown (OH) and Sen. Roy Blunt (MO) introduced a companion measure, S. 1468, the "Revitalize American Manufacturing and Innovation Act of 2013," in the Senate.

H.R. 2996 establishes the Network for Manufacturing Innovation (NMI) Program within NIST to improve American manufacturing competitiveness; stimulate innovation; facilitate transition of novel technologies to commercialization; accelerate workforce development; and leverage non-Federal capital.

The bill creates Centers for Manufacturing Innovation (CMI) to address challenges in advanced manufacturing and focus on manufacturing processes, new materials or technologies, and supply chain methodologies. CMIs will include active participation from industry, research universities, community colleges, and other entities. Activities of the CMIs include research and development, proof-of-concept and prototyping, and reducing the cost, time, and risk of commercialization of new technologies and processes. CMIs will also develop education and training programs and conduct outreach and engagement with small and mid-size businesses. Existing manufacturing centers, including the National Additive Manufacturing Innovation Institute, will be considered part of the NMI.

Under the bill, federal funding for CMIs will be awarded by the Secretary to assist in the planning, establishment, and support of centers through an open, merit-based application process. Federal funding to Centers will be limited to seven years, after which Centers will need to be self-sustaining.

H.R. 2996 establishes a National Program Office to carry out the planning, management and coordination of the centers for innovation. The Office will coordinate with other federal agencies engaged in advanced manufacturing including: DOD, Education, DOE, NASA, NSF and NIST. Within one year, the program offices will need to develop a strategic plan to guide the entire program. The Office will establish a public clearinghouse of activities being carried out within the program. Additionally, the Office will work with the Hollings Manufacturing Extension Partnership programs with the intention of coordination and avoiding duplication of efforts.

The bill requires annual reports to be delivered from the National Program Office to the Secretary of Commerce and Congress. The GAO will conduct a triennial assessment to ensure the program is fulfilling the goals of the legislation.

H.R. 2966 authorizes $600 million in Appropriations for the creation of the Network for Manufacturing Innovation Fund, to be offset by a $600 million rescission from appropriated discretionary funds that remain available for obligation.