Legislative Update

Focus on:

National manufacturing initiatives;
Reauthorization of the COMPETES act;
The federal budget outlook.

Presented by:

Richard Benson, Virginia Tech, and
Joseph Helble, Dartmouth

The “Secret Decoder Ring” for Manufacturing Initiatives

- **NNMI** = National Network for Manufacturing Innovation;
- **MII** = Manufacturing Innovation Institute;
- **NAMII** = National Additive Manufacturing Innovation Institute;
- **PCAST** = President’s Council of Advisors on Science and Technology;
- **AMP** = Advanced Manufacturing Partnership.

Call to Establish a National Network of Manufacturing Innovation Institutes (MII)

The AMP Steering Committee proposes the formation of MIIs as public-private partnerships to foster regional ecosystems in advanced manufacturing technologies.

The first MII is the National Additive Manufacturing Innovation Institute (NAMII), lead by Case Western Reserve University

Early Reviews on the NAMII

According to James D. McGuffin-Cawley
Chair of the Department of Materials Sci. & Engr.
Case Western Reserve University

"The NAMII … has already resulted in cross institutional collaboration between Ohio universities – notably CWRU, Akron, and Youngstown State."

"The desired impact seems to be happening."

And Another Review of the NAMII

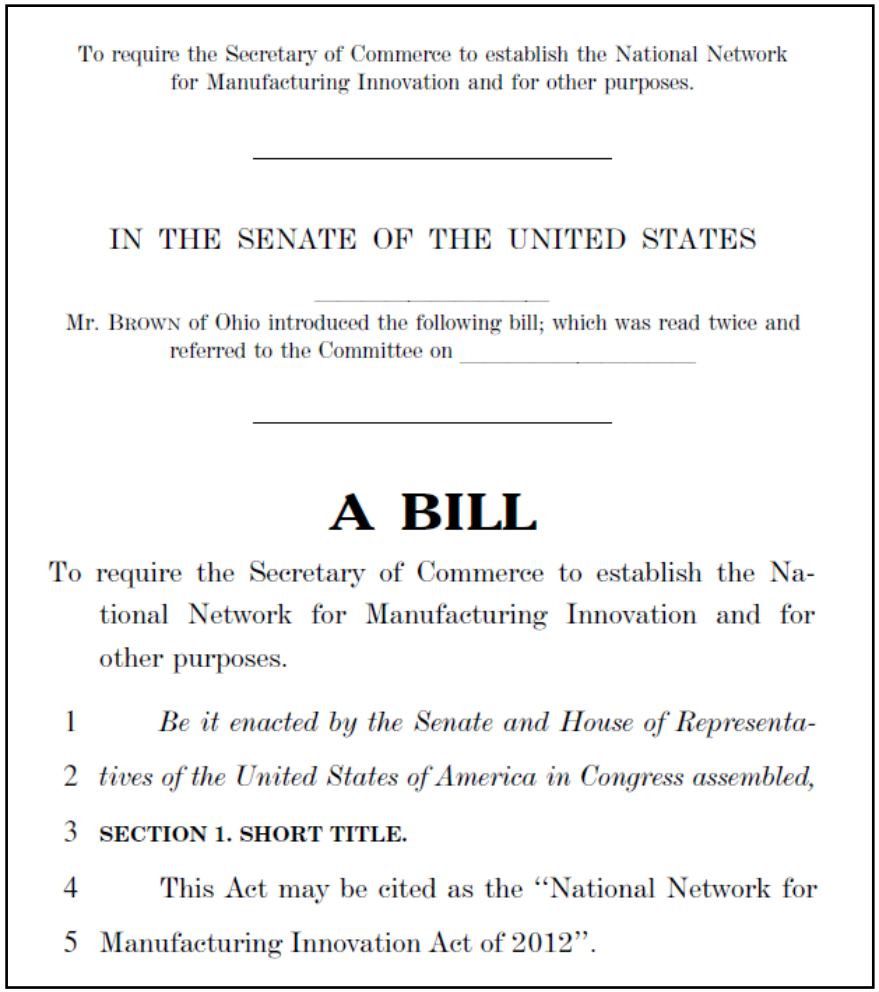
According to Lisa Camp, CWRU:

"We have had a number of companies who never considered additive manufacturing as part of their business processes, and thus it has started new conversations about the role of this technology in the region. Timken, Lincoln Electric, Goodyear, are just a few of those now looking at additive differently. If our job in NAMII is to help bring innovation into the manufacturing sector, the conversations and activities it has already enabled is just a glimpse of what this could mean for the Tech-Belt."

NNMI Legislation

A bill, first introduced by Senator Sherrod Brown of Ohio in 2012 is likely to be reintroduced in 2013.

Based on reports on the NAMII the concept appears to have great potential to impact manufacturing in the US and engineering research and education.



To require the Secretary of Commerce to establish the National Network for Manufacturing Innovation and for other purposes.

IN THE SENATE OF THE UNITED STATES

Mr. BROWN of Ohio introduced the following bill; which was read twice and referred to the Committee on

A BILL

To require the Secretary of Commerce to establish the National Network for Manufacturing Innovation and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Network for Manufacturing Innovation Act of 2012".

112th Congress

Other Manufacturing Legislation

H.R.375 and S.63 -- Make It In America Manufacturing Act of 2013
Rep. David Ciciline, D-R.I. and Sen. Kirsten Gillibrand, D-N.Y.

Would provide grants of up to $20 million to states or regional partnership for strategies – e.g. revolving loans, training, promoting exports – to enhance manufacturing.

H.R.394 -- Nanotechnology Advancement and New Opportunities Act, *Rep. Michael Honda, D-CA.*

Provides for public-private partnerships funded by tax credits and Commerce Department grants. Partnerships would fund research and development and establishment of incubators. Sets up a nanotechnology startup advisory council.

Supportive statements that you might make on Wednesday about the NNMI

- Manufacturing is important to economy
- Manufacturing is necessary to maintain engineering capacity
- Collaboration is the key to innovation in manufacturing. Examples Fraunhofer and SEMATECH
- A federal role helps capture the full value of investments in engineering research and education.

Oppositional statements that you might hear on Wednesday about the NNMI

- The concept is good but where will the funds come from?
- The government does not have a role here; other policy approaches are more appropriate.

An Argument for Proximity

"These linkages between manufacturing and innovation mean that the success of knowledge-based services like R&D often depends on the success of domestic production activities. As President George W. Bush's Council of Advisors on Science and Technology put it, **'The proximity of research, development, and manufacturing is very important to leading-edge manufacturers.'**"

DAVID M. HART, STEPHEN J. EZELL, and ROBERT D. ATKINSON, "Why America Needs A National Network for Manufacturing Innovation," December 2012.

The AMP Steering Committee's "Starter List" of MIIs (1/2)

- Advanced sensing, measurement, and process control
- Advanced material design and synthesis, including nanomaterials, metamaterials, metals, coatings, ceramics
- Information technologies, including visualization and digital manufacturing
- Sustainable manufacturing
- Nano-manufacturing (includes micro feature manufacturing)

The AMP Steering Committee's "Starter List" of MIIs (2/2)

- Flexible electronics
- Bio-manufacturing and bioinformatics, including proteomics and genomics
- Additive manufacturing
- Advanced manufacturing equipment (including testing)
- Industrial robotics
- Advanced forming (including near net shape manufacturing) and joining/bonding technologies

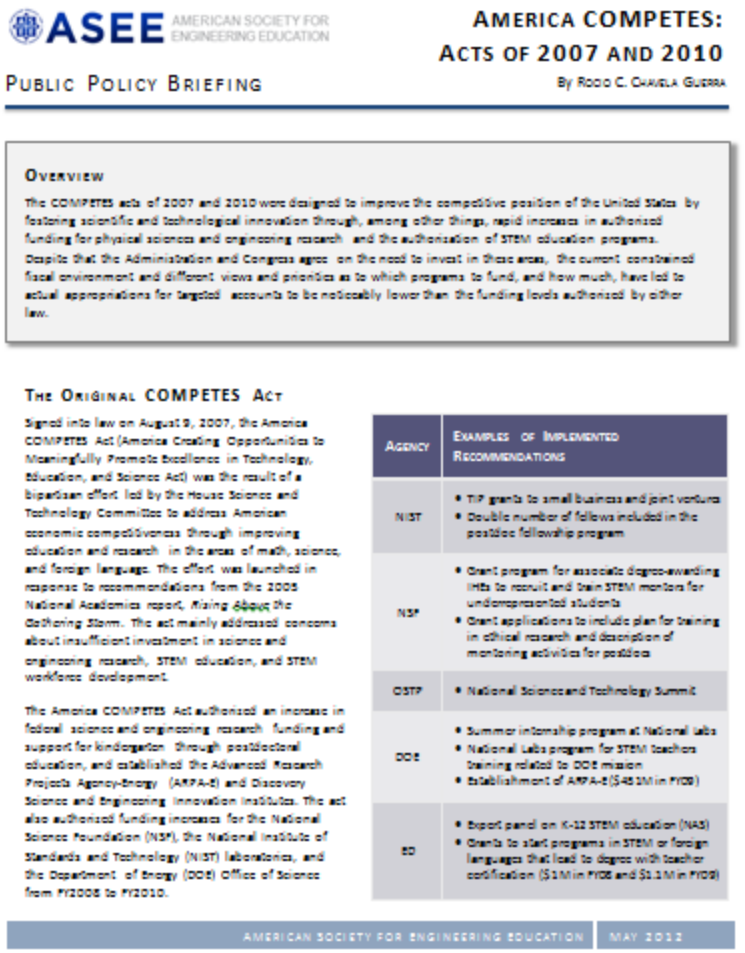
Questions for Later Discussion

What steps should the Engineering Deans Council take on the creation of a National Network of Manufacturing Innovation (NNMI)?

What should be the research priorities in advanced manufacturing? Is there anything that should be added or subtracted from the AMP Steering Committee "Starter List"?

COMPETES

- Some history
- Outlook for reauthorization



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PUBLIC POLICY BRIEFING

AMERICA COMPETES: ACTS OF 2007 AND 2010

By Rodo C. Chavela Guerra

Overview

The COMPETES acts of 2007 and 2010 were designed to improve the competitive position of the United States by fostering scientific and technological innovation through, among other things, rapid increases in authorized funding for physical sciences and engineering research and the authorization of STEM education programs. Despite that the Administration and Congress agree on the need to invest in these areas, the current constrained fiscal environment and different views and priorities as to which programs to fund, and how much, have led to actual appropriations for targeted accounts to be noticeably lower than the funding levels authorized by other law.

The Original COMPETES Act

Signed into law on August 9, 2007, the America COMPETES Act (America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act) was the result of a bipartisan effort led by the House Science and Technology Committee to address American economic competitiveness through improving education and research in the areas of math, science, and foreign language. The effort was launched in response to recommendations from the 2005 National Academies report, *Rising Above the Gathering Storm*. The act mainly addressed concerns about insufficient investment in science and engineering research, STEM education, and STEM workforce development.

The America COMPETES Act authorized an increase in federal science and engineering research funding and support for kindergarten through postdoctoral education, and established the Advanced Research Projects Agency-Energy (ARPA-E) and Discovery Science and Engineering Innovation Institutes. The act also authorized funding increases for the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) laboratories, and the Department of Energy (DOE) Office of Science from FY2008 to FY2010.

Agency	Examples of Implemented Recommendations
NIST	• TIP grants to small business and joint venture • Double number of fellows included in the postdoc fellowship program
NSF	• Grant program for associate degree-awarding IHEs to recruit and train STEM mentors for underrepresented students • Grant applications to include plan for training in ethical research and description of mentoring activities for postdocs
OSTP	• National Science and Technology Summit
DOE	• Summer internship program at National Labs • National Labs program for STEM teachers training related to DOE mission • Establishment of ARPA-E ($45.1M in FY09)
ED	• Expert panel on K-12 STEM education (NAS) • Grants to start programs in STEM or foreign languages that lead to degree with teacher certification ($1M in FY08 and $1.1M in FY09)

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History

- America COMPETES 2010 retains the central policy thrust of the 2007 act: a commitment to increased funding for R&D in the physical sciences and engineering and to certain federal STEM education programs.
- New programs established by the reauthorization include the Regional Innovation Program, Loan Guarantees for Innovative Technologies in Manufacturing, and the STEM-Training Grant Program.
- COMPETES 2010 authorizes but funding (appropriation) has been and continues to be the challenge

Reauthorization of COMPETES

Looking for Bill late spring early summer covering:

NSF

NIST

DOE Office of Science

Energy R&D expected to be separate

Questions for the committee

- Bipartisan compromise?
- Authorization levels?
- Duration?
- Retain Commerce provisions?

House Science Committee - Feb 6*

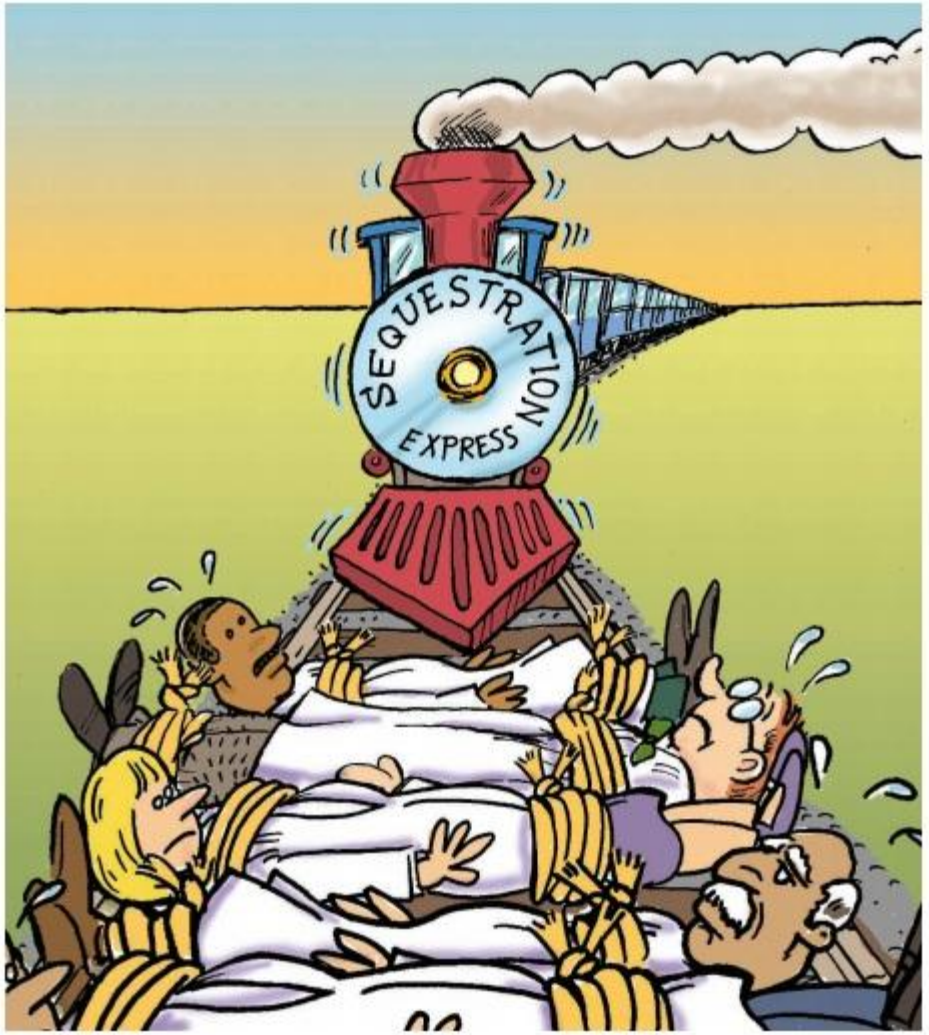
- We clearly need a new financial model that can overcome the so-called "valley of death," for **entrepreneurial, technology-based start-ups** -- between venture funding and full-blown major investment -- when no financing is obtainable.
- Equally important is the **physical capital** that allows new technologies to be improved and scaled…— facilities for applied research – including shared infrastructure – for… prototyping and testing of new technologies, for the development of advanced manufacturing processes
- Clearly, the skilled labor demands of **advanced manufacturing** require that we make comprehensive education and retraining efforts a priority if the U.S. is to remain competitive

- COMPETES – and advanced manufacturing– of continuing importance. Immediate challenge - sequestration

** S.A. Jackson, RPI, testifying before House Science, Space, and Technology Committee Feb. 6, 2013, on American Competitiveness and the Role of R&D*

Sequestration

- March 1 Deadline
- CR freezes spending at FY2012 levels until March 27th
- Lower caps on discretionary funding
- AAU talking points
- AAU/APLU letter



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Key Points: Sequestration and R&D

- Budget Control Act (August 2011) established 10 year caps on discretionary spending
- BCA caps reduce spending (as % GDP) to lowest level in 50 yrs
- Sequestration would cut non-defense discretionary spending by 5.1% this FY, cuts to continue for decade
- China, Singapore, South Korea - double digit *increases* in R&D spending
- R&D and education spending are *investments* in future economic growth and prosperity

Key Points: Sequestration and R&D

- Cuts would come at a time when we have finally reversed 30 year decline in engineering degrees
  - 2012 ENG BS degree totals likely highest since 1985
  - 2013 and 2014 should be even higher

- Many universities investing in growth in engineering. Federal partnership essential for success

- Local stories important – entrepreneurship, engineering jobs in local economy, federal R&D spending cut impact at your university

Wrap Up

- Be positive recognizing there are budget issues
- Talk about what is going on in your District/State-how sequestration could affect what you are doing
- R&D has traditionally had strong bipartisan support and we are grateful.

Budget Status

Program	FY2012	FY13A	FY13R	House Passed	Senate Rpt	FY13Final
DOE OfS	4874	6001	4992	4801	4909	?
DOE ARPA-E	275	312	350	200	312	?
DOC Loan	5	20		5		?
DOC RIP		100	25		25	?
DOC LG SPI	5	7	7		7	?
DOC MEP	128	165	128	128	128	?
NSF Total	7033	8300	7373	7333	7273	?

Figures are rounded

Billions $

Blanks are not defined

Some Key Provisions

- *National Science Foundation*—Partnerships for Innovation,15 and Academic Technology Transfer and Commercialization of University Research.16
- *Department of Commerce*—Office of Innovation and Entrepreneurship,17 Federal Loan Guarantees for Innovative Technologies in Manufacturing,18 and NIST Green Jobs.19
- *Department of Energy*—Advanced Research Project Agency—Energy.20
- Some other provisions authorizing inducement prizes and research competitions at federal agencies,39 directing the Department of Commerce to complete a comprehensive study of U.S. competitiveness and innovation,40 and establishing regional economic development programs.41