Interagency Advanced Manufacturing National Program Office
AMNPO

Executive Office of the President

Advanced Manufacturing Partnership (AMP/PCAST)

Advanced Manufacturing National Program Office (hosted by DOC - NIST)

NSTC - Subcommittee on Advanced Manufacturing
Background
Importance of manufacturing to national well-being recognized early!

“"It is a truth as important, as it is agreeable, and one to which it is not easy to imagine exceptions, that everything tending to ... to increase the total mass of industry ... is ultimately beneficial to every part of [the nation].”

-- Alexander Hamilton, 1791
Challenge: US Losing Leadership In Advanced Products

U.S. Trade Balance for Advanced Technology Products

Source: Census Bureau
Products Invented Here, Now Made Elsewhere - Not Driven By Labor Cost
PCAST 2011
Recommends Advanced Manufacturing Initiative as national innovation policy

PCAST 2012
Recommends Manufacturing Innovation Institutes to address key market failure

PCAST 2014
Recommends strong, collaborative network of Manufacturing Innovation Institutes
Focus is to address market failure of insufficient industry R&D in the “missing middle” or “industrial commons” to de-risk promising new technologies.
Action
“In my State of the Union Address, I asked Congress to build on a successful pilot program and create 15 manufacturing innovation institutes that connect businesses, universities, and federal agencies to turn communities left behind by global competition into global centers of high-tech jobs.

“Today, I’m asking Congress to build on the bipartisan support for this idea and triple that number to 45 – creating a network of these hubs and guaranteeing that the next revolution in manufacturing is ‘Made in America.’”

- President Barack Obama, July 30, 2013

118 Bipartisan RAMI Bill Sponsors

December 16, 2014 – Signed By President Obama
Vision: U.S. global leadership in advanced manufacturing

Mission: Connecting people, ideas, and technology to solve industry-relevant advanced manufacturing challenges, thereby enhancing industrial competitiveness and economic growth, and strengthening our national security.

The four interrelated program goals. From 2016-2019 Strategic Plan
Network and Institute Design
The Institute Design
Creating the space for Industry & Academia to collaborate

White House Report
Framework Design
January 2013

National Network of Institutes

Institute for Manufacturing Innovation
Prototype lab/shops
Research facility
Computer lab

Shared Use Facility

Academia
Universities & National Labs
Community Colleges

Government
Federal
State & Local
Economic Dev. Org.

Industry
Large Manufacturing Companies
Small & Medium Enterprise
Start-ups
Progress to date
$600 million federal investment matched by over $1.3 billion non-federal

Eight active institutes: 1,300 members, over 240 technology development projects.

- Members include two-thirds of Fortune 50 U.S. manufacturers
- 8 out of the 10 top-ranked research and engineering universities.

Competitions underway for additional institutes
Two upcoming DOE-led NNMI Institutes

Network Status and 2016/17 Plans

- Open topic: 1 or 2 institutes
- Adv. Tissue Biofabrication
- Robots in Mfg. Environments
- Modular Chemical Process Intensification
- REMADE (Sustainable Mfg)

Since launching in 2012:
- $600M+ Fed matched by $1.3B+ non-Fed
- 1,300+ companies, universities, and non-profits involved
- 30+ states

Planned 2016/17

- Flexible Hybrid Electronics
  San Jose, CA
- Smart Manufacturing
  Los Angeles, CA
- Additive Mfg
  Youngstown, OH
- Photonics
  Rochester, NY
- AIM Photonics
  Rochester, NY
- AIM Photonics
  Youngstown, OH
- AFFOA - Fibers and Textiles
  Cambridge MA
- Digital Mfg
  & Design
  Chicago, IL
- Lightweight
  Metals
  Detroit, MI
- Advanced
  Fiber-Reinforced
  Polymer Composites
  Knoxville, TN
- PowerAmerica
  Wide Bandgap
  Semiconductors
  Raleigh, NC
- iACMI
  Smart Manufacturing
  Los Angeles, CA

Highlighted states have major participants in Manufacturing USA Institutes.
Commerce/NIST Institutes
“Open Topic” Competition

Uses new authorities under the Revitalize American Manufacturing and Innovation Act (RAMI) —

Proposals accepted on any topic not already covered by existing NNMI institutes or in-process competition

• Key attributes
  • Open topic competition
  • Up to $70 M federal share per Institute
  • Each institute to serve as a regional hub with well-defined focus area
Example Institute
Example Institute: America Makes

The National Additive Manufacturing Innovation Institute

The National Accelerator for Additive Manufacturing
1) Each Institute has a clear mission based on a critical Industry need

**WHY**
The U.S. is not doing well in the Global Economy, and needs a reinvigorated Manufacturing Sector that includes a strong Defense Industrial Base.

**HOW**
Transform manufacturing in the U.S. through innovative, coordinated Additive Manufacturing Technology Development, Technology Transition, and Workforce & Educational Outreach.

**WHAT**
Accelerated adoption of additive manufacturing technologies in the U.S. manufacturing sector that yield innovative products and increased domestic manufacturing competitiveness that yield innovative products and increased domestic manufacturing competitiveness.
2) Each Institute creates value for industry participation and funding

- Robust Additive Manufacturing Roadmapping
- Opportunity to Participate in Funded Projects
  - Consortium-driven Project Calls
  - Agency-driven Projects
  - Member-driven Projects
  - Client-driven Projects
  - Competitively-awarded Projects
  - Crowd-sourced Projects
- Access to Consortium Developed IP
- Use of the America Makes Innovation Factory
3) Each Institute is operated by an industry-led consortium

174 members; continuing to grow

- 106 Industry Partners
  (60 Small Businesses)
- 39 Academic Partners
  (including community colleges)
- 14 Government Partners
- 11 Non-Profit Organizations
- 4 Manufacturing Extension Partnerships (MEPs)

Operated by the National Center for Defense Manufacturing & Machining (NCDMM)
4) Each Institute works on the industry priorities and big challenges only solvable by collaboration

- Technology Roadmap v. 2.0
- Workforce and Education Roadmap v. 1.0
  → National Forum on Additive Manufacturing Education & Training, October 11-12, 2016, State College, PA
- systems engineering-based methodology

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5) Each Institute manages a balanced portfolio of real projects for Industry

Project Portfolio Total: $97M
- Public Total: $56.5M
- Cost Share Total: $40.5M

Total Project Count: 66
- Annual Project Calls*: 52
- Agency Directed: 14

*Includes
- Technology Development,
- Technology Transition,
- Workforce & Educational Outreach

America Makes 3DP Sand Casting Adoption Project
Summary

The “What”

• Ensure U.S. inventions are not “stranded in the laboratory”
  • *Or worse, adopted only by competitive countries*
• Ensure U.S. workforce is prepared with the skills required for success in factories of the future.

The “How”

• Engage entire industry sectors and supply chains along with research universities and federal labs to work together to develop new manufacturing processes.
• Enhance community college and other workforce training efforts via side-by-side work with industry.
• Provide an industrial commons, or shared workspace (the institute) for these efforts

→ Manufacturing innovation ecosystems across the U.S.!
Thank You! – To learn more...

www.ManufacturingUSA.com