Advanced Manufacturing at the U.S. Department of Energy

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Draft AMO MYPP for Public Comment

Advanced Manufacturing Office Multi-Year Program Plan for Fiscal Years 2017 through 2021

- Sets forth the Office mission, vision, and goals
- Identifies the technology, outreach, and crosscutting activities the Office plans to focus on over the next five years.

Public feedback and comments can be sent to AMO_MYPPInfo@ee.doe.gov by February 10, 2017.

The updated plan will reflect consideration of the comments received.

View and download the AMO MYPP
AMO Vision and Mission

Vision: U.S. global leadership in sustainable and efficient manufacturing for a growing and competitive economy.

Mission: Catalyze research, development and adoption of energy-related advanced manufacturing technologies and practices to drive U.S. economic competitiveness and energy productivity.
AMO Strategic Goals

• Improve the productivity and energy efficiency of U.S. manufacturing.

• Reduce lifecycle energy and resource impacts of manufactured goods.

• Leverage diverse domestic energy resources in U.S. manufacturing, while strengthening environmental stewardship.

• Transition DOE supported innovative technologies and practices into U.S. manufacturing capabilities.

• Strengthen and advance the U.S. manufacturing workforce.
Success Indicators

• Demonstrate selected advanced manufacturing technologies and deploy practices that increase the rate of energy intensity improvement from business as usual (~1% per year) to 2.5% per year.

• Develop advanced materials, manufacturing technologies, and targeted end use products with the potential to reduce lifecycle energy impact by 50% by 2025 compared to the 2015 state-of-the-art.

• Establish partnerships resulting in 30,000 U.S. manufacturing facilities implementing AMO-recognized energy management products, practices and measures by 2025.

• Double supported technical education and training activities in advanced manufacturing made available for universities, community colleges, and high schools by 2025.
QTR and Multiyear Program Plan (draft) Technologies
Manufacturing Institute Framework

Applied Research + Education/Workforce Skills = Development of Future “Manufacturing Hubs”

- Federal funding is the catalyst to bring stakeholders into shared space to de-risk innovation.
- Focus is on industry-relevant problems impacting commercial production, MRL 4-7.
- Institutes must be self-sustaining after federal startup investment ends.
- Workforce training and development is an essential component in institute focus.

Federal startup investment: $70M per institute over 5 years
Institute Consortium owners must have minimum 1:1 co-investment
Manufacturing USA Strategic Goals

- Increase the competitiveness of U.S. manufacturing.
- Facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing domestic manufacturing capabilities.
- Accelerate the development of an advanced manufacturing workforce.
- Support business models that help institutes become stable and sustainable.

Shaded states have major participants in Manufacturing USA Institutes
PowerAmerica is accelerating the adoption of advanced semiconductor components made with silicon carbide (SiC) and gallium nitride (GaN) into a wide range of products and systems.

- Launched in January 2015
- 17 industry members, 7 universities and 3 national labs (ANL, NRL, NREL)
- $70 million Federal support matched by $70 million non-Federal
- Dramatically reduce costs of wide bandgap materials and devices
- Will enable higher temps, voltages, frequency, and power loads
Highlights: X-Fab Texas launches SiC Merchant Foundry

X-Fab Texas

- Using existing Si fab line, launched first available “merchant” SiC line
- Will dramatically reduce cost of SiC wafers for global power electronics market
- Supports 400 jobs in Lubbock, TX and will produce first device fall 2016

Read More at: https://www.whitehouse.gov/blog/2016/04/04/depth-look-manufacturing-hubs-helped-business-innovate
Institute for Advanced Composite Material Manufacturing (IACMI): Develop and demonstrate technologies to produce carbon fiber composites at 50% the cost and 75% less energy.

- Launched in January 2015
- $70 million Federal support matched by $180 million non-Federal
- 94 Total members including 72 industry members, 14 universities, and 2 national labs
- 46 Small and medium-sized industry partners
DOE NNMI Institute #2 – Carbon Fiber Composites (Oak Ridge, TN)

- Established regional centers of excellence across a number of fiber composite applications
Smart Manufacturing (Los Angeles, CA)

- Announced by President on June 15, 2016
- Almost 200 industry, university, and other partners
- 5 regional centers headquartered at UCLA

DOE NNMI Institute #3 – Smart Manufacturing (Los Angeles, CA)

Institute Goals
- >50% improvement in energy productivity
- >50% reduction in installation cost of Smart Manufacturing hardware and software
- 15% Improvement in Energy Efficiency at systems level
- Increase productivity and competitiveness across all manufacturing sectors

• Advanced sensors and controls for real-time process management

Focus on Real-Time
For Energy Management
Two newest DOE-led NNMI Institutes

**Modular Chemical Process Intensification:** Focus on breakthrough technologies to dramatically improve energy efficiency of novel chemical manufacturing processes.

**REMADE:** Dramatically reduce life-cycle energy consumption through the development of technologies for reuse, recycling, and remanufacturing of materials.
The Power of Connections

Together, the Institutes’ convene nearly 1,200 organizations in an inter-industry network comprised of 9,000+ organization relationships.

- Some organizations in the outer “fans” take advantage of the convening power of the Institutes to keep abreast of developments in their technology area and network with their peers.
- Organizations in the center of the network are highly involved in projects across multiple institutes and help steer the direction of the network.

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<tr>
<th>Count</th>
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<td>Relationships between organizations</td>
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<td>Organizations have relationships with multiple institutes</td>
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