Accelerating Advanced Manufacturing

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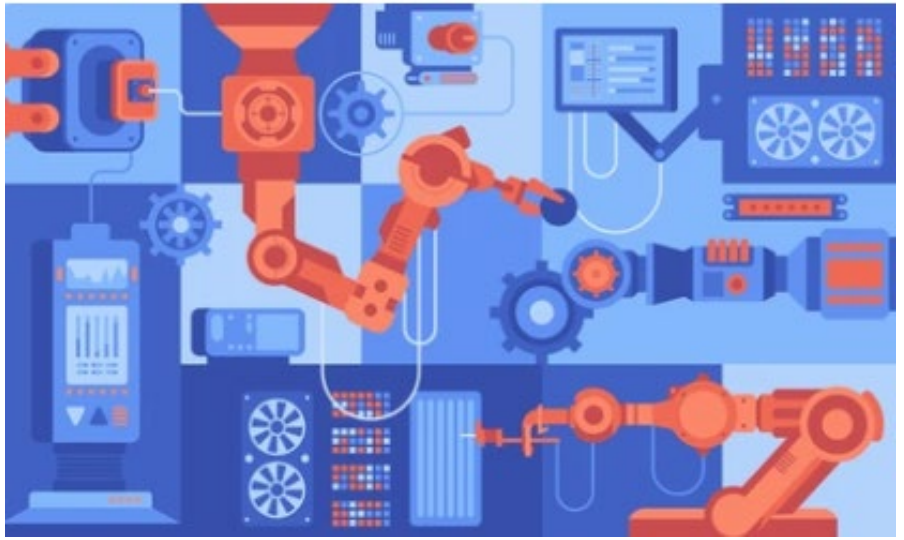
Supercharge U.S. Manufacturing

To build and secure U.S. industrial capacity, high-impact **technologies** are needed to reach **commercial-scale adoption** by domestic manufacturers

Innovative technologies provide a competitive edge for the U.S.

- Increase productivity:
  Boost worker output and manufacturing process efficiencies.
- Build new capabilities:
  Create new products, new markets, and strengthen economic and national security.
- Amplify supply chains:
  Power up the small- and medium-sized manufacturers that form OEM supply chains. Multiply competitive advantages at every level.



Credit: Shutterstock

Accelerating Advanced Manufacturing

- Technology provides a competitive edge for U.S. industry
- Catalyze investment for technology to reach commercial scale faster
- Leverage points
  - De-risk investments in new technology
  - Accelerate technology adoption at scale

Credit: Shutterstock

Credit: SpaceX floor (MIT TR)

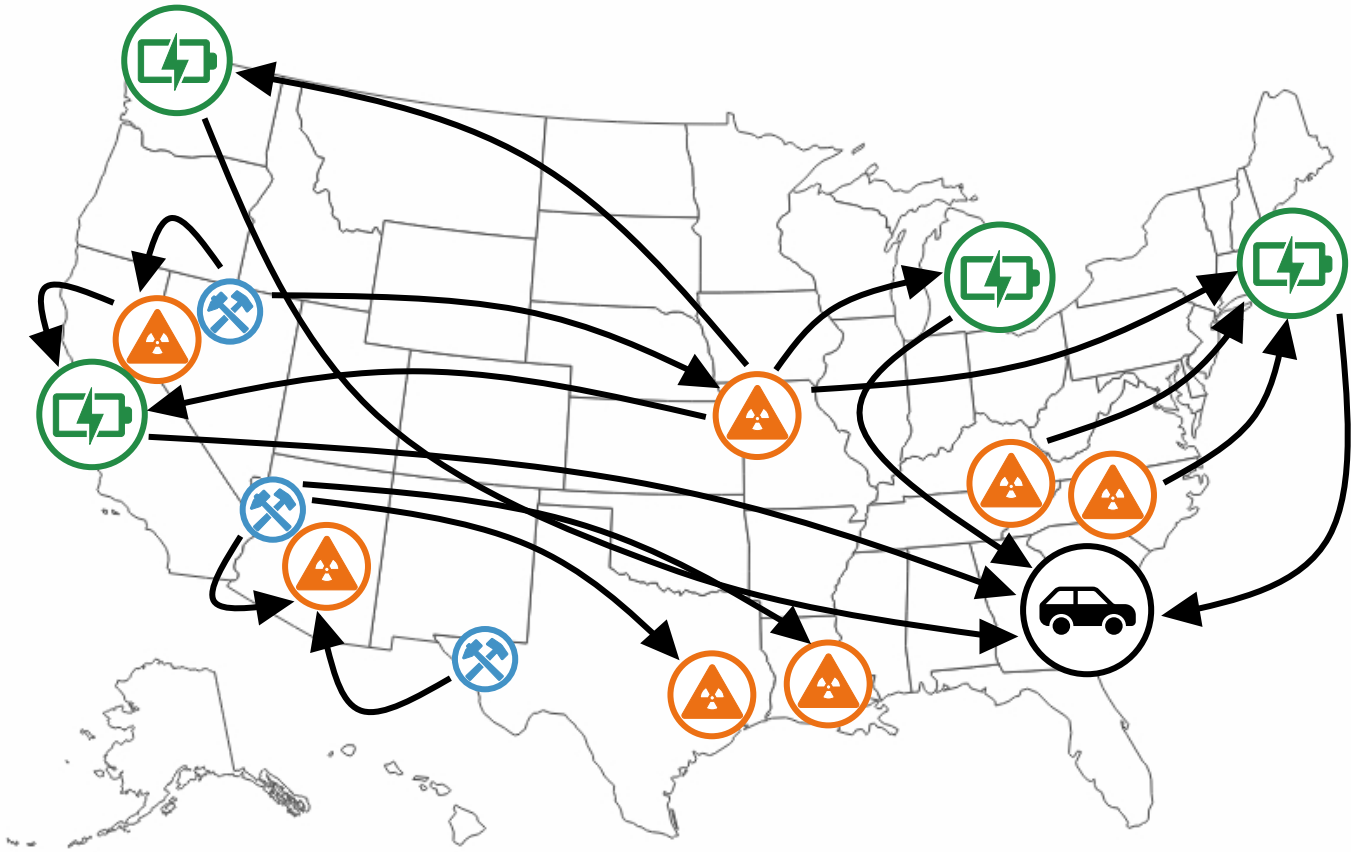
Technology at Scale: Complex Networks

OEM
Auto manufacturer

Tier 1 Supplier
Battery manufacturer

Tier 2 Supplier
Materials processing, chemicals supplier

Tier 3 Supplier
Raw material supplier



"In a modern economy, innovation must not only be invented—it must be diffused. **Knowledge has economic impact only when it is transmitted to firms and deployed at scale.**"

- Center for a Prosperous America (CPS)

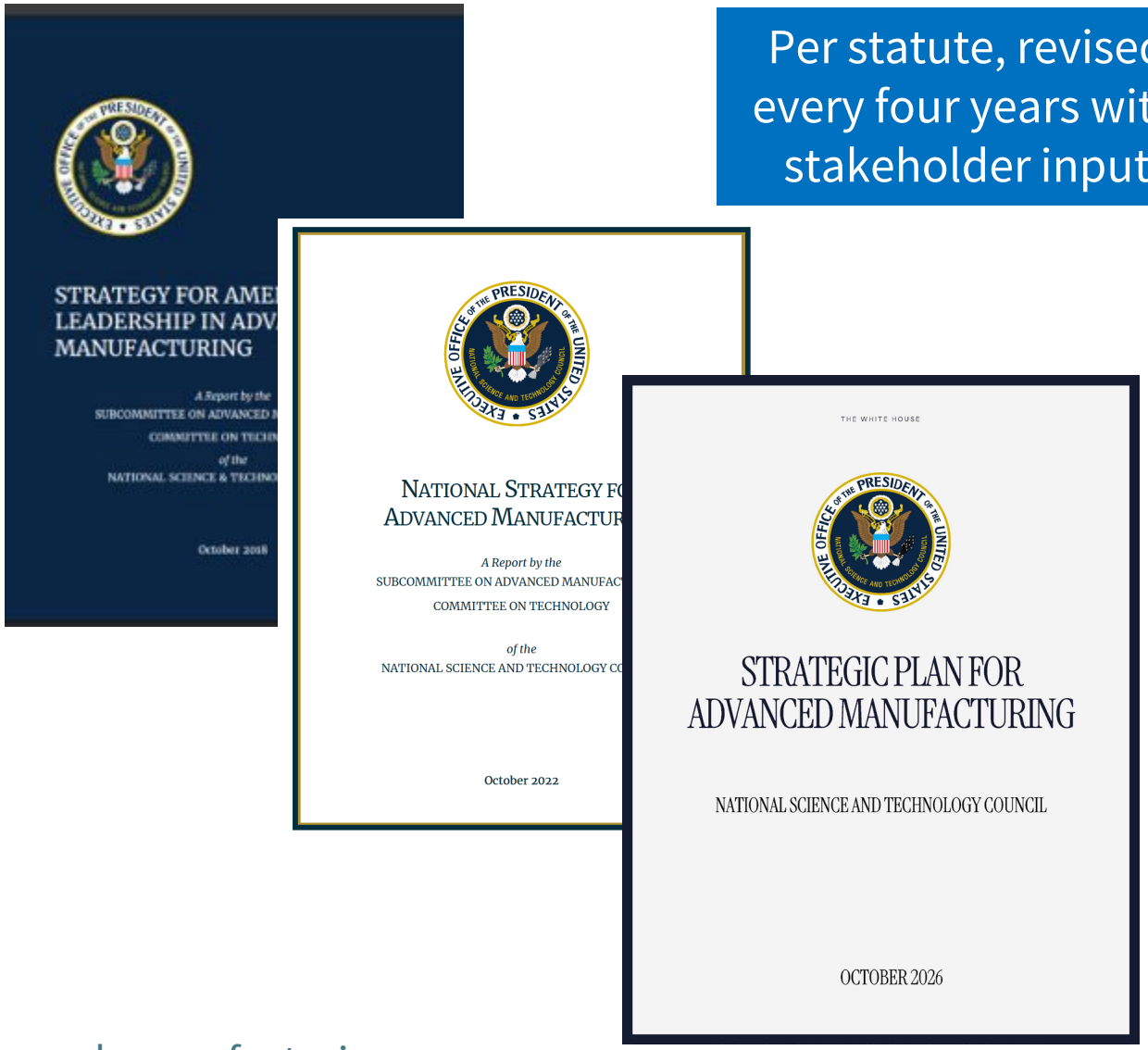
National Strategy for Advanced Manufacturing

The White House Office of Science and Technology Policy (OSTP) solicited input for the 2026-2030 National Strategy for Advanced Manufacturing

Public input has identified **science and technology areas** that will be key to the next generation of innovative advanced manufacturing technologies

Stakeholders stress the importance of not only **investing in R&D** but also **deploying U.S. innovations at industrial scale**

Per statute, revised every four years with stakeholder input



https://www.nist.gov/oam/national-strategic-plan-advanced-manufacturing

National Strategy for Advanced Manufacturing

Collect responses → **Consolidate and analyze input** → **Develop Federal Adv. Mfg. Strategic Plan**

26 town halls completed
Over 2,000 participants
716 unique responses

Town halls

Regulations.gov

205 responses
1,659 pages of online submissions: text, slides, Word docs, PDFs

Data analysis

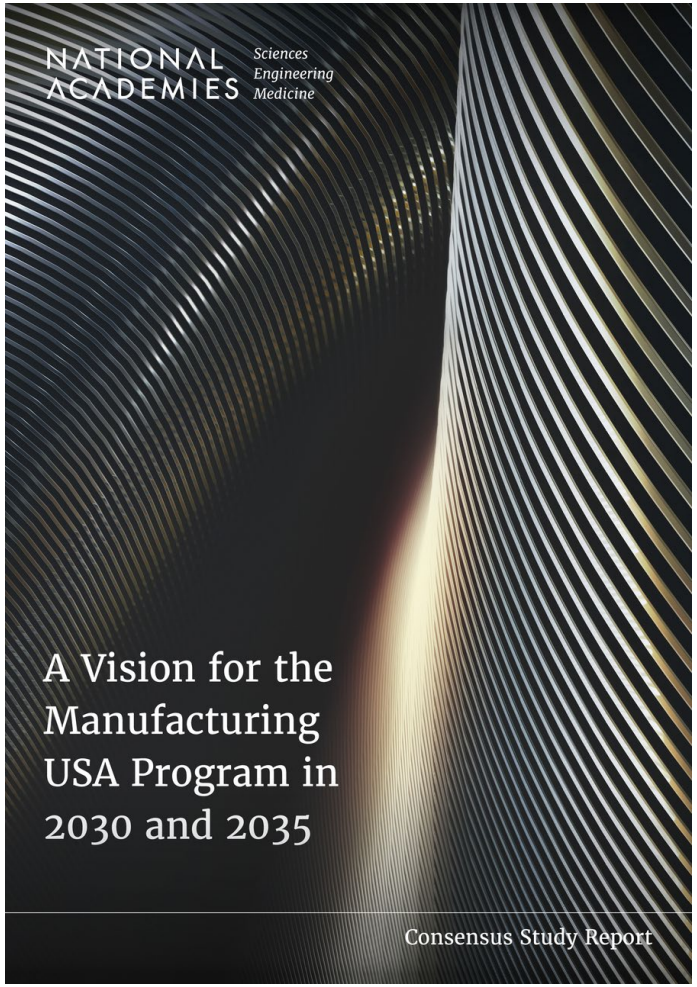
* AI-supported

NASEM Study: Manufacturing USA

Examines how the Manufacturing USA program can be strengthened to meet the nation's manufacturing challenges over the next decade and beyond.

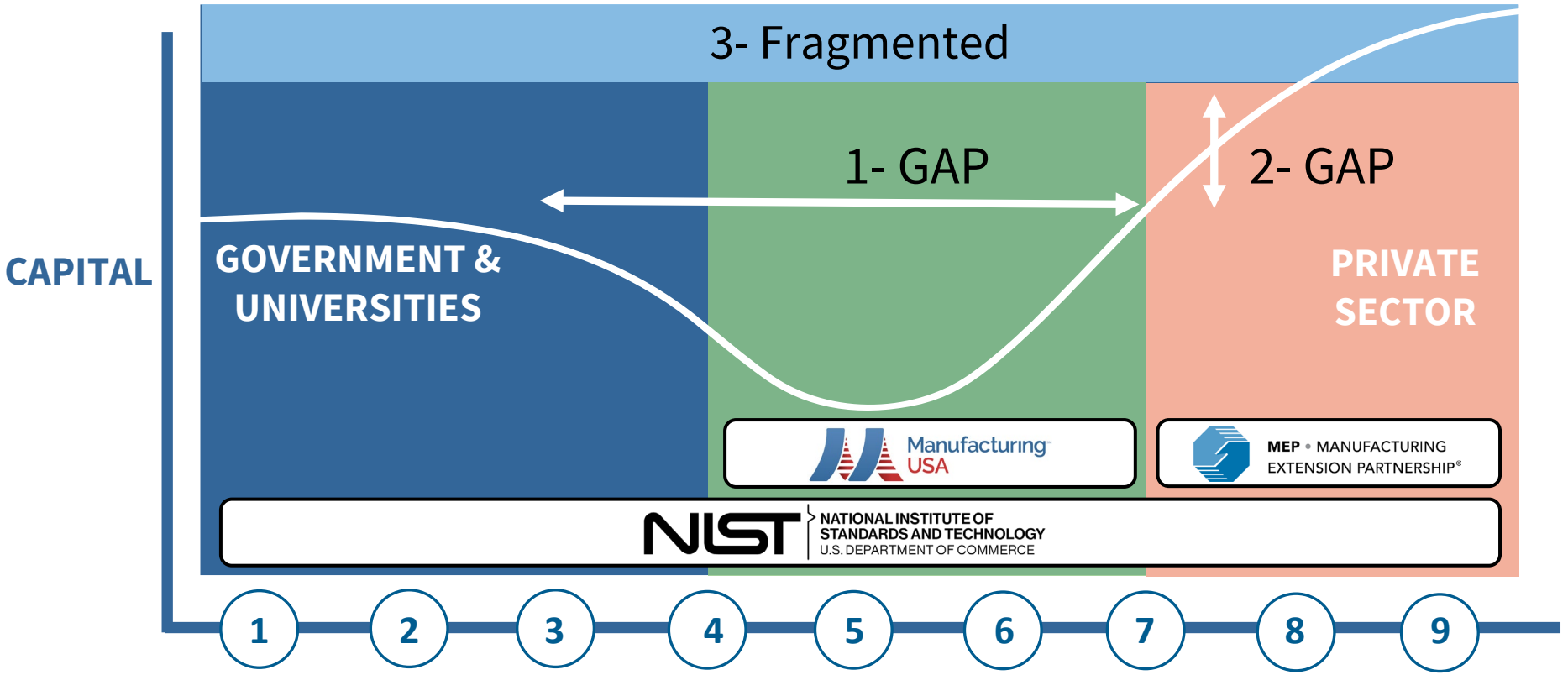
Makes recommendations across four critical areas —

- technology transfer,
- interagency and cross-network collaboration,
- regional manufacturing ecosystems, and
- education and workforce development.



https://www.nationalacademies.org/projects/DEPS-NMMB-24-01

Manufacturing Technology Adoption & Scale Up



MRL = Manufacturing Readiness Level

Barriers / Gaps

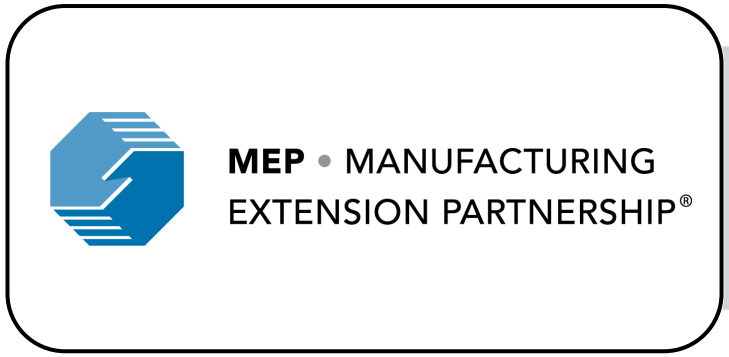
1. "Valley of Death"
- Moving from laboratory demo to prototype.
- Requires solutions for pre-competitive, shared problems.

2. Scale-up "Mountain"
- Moving from prototype solutions to commercial scales
- Often requires high CapEx facilities to reach scaled-up production

3. Fragmented Tech Stack
- Different MRL levels are addressed by different organizations
- Standards, data, and foundational R&D facilitate integration

NIST Manufacturing Initiatives

Technology Transition Roadmaps



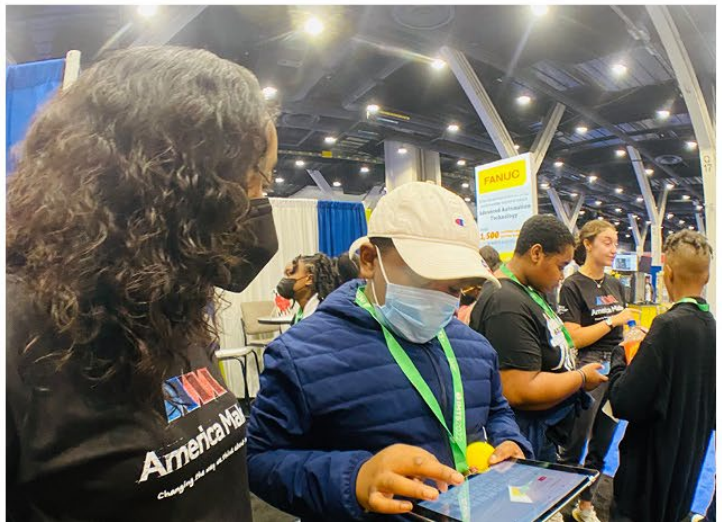
Technology Acceleration Pilot

Manufacturing USA

VISION: Securing U.S. Global Leadership in Advanced Manufacturing

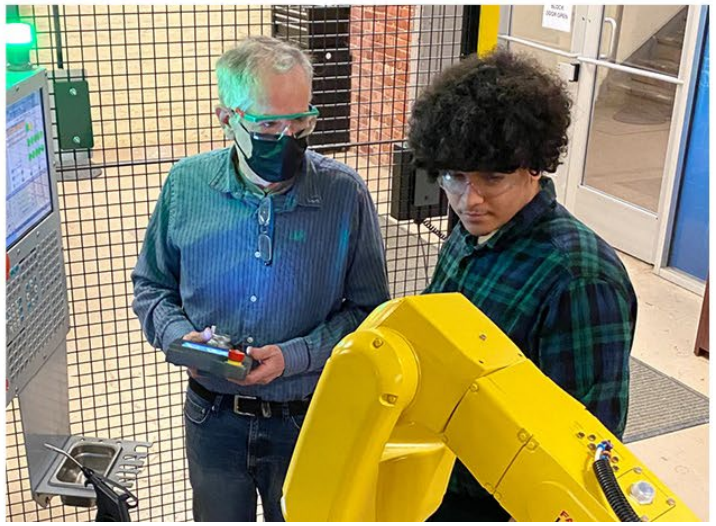
MISSION: **Connecting people, ideas, and technology to**:

- Solve industry-relevant advanced manufacturing challenges
- Enhance industrial competitiveness and economic growth
- Strengthen our economic and national security



Credit: America Makes

Credit: BioFabUSA



Credit: America Makes

Manufacturing USA Network

ELECTRONICS

AIM Photonics — Integrated Photonics — *Albany, NY; Rochester, NY*

NextFlex — Flexible Hybrid Electronics — *San Jose, CA*

PowerAmerica — Wide Bandgap Semiconductors — *Raleigh, NC*

MATERIALS

AFFOA — Advanced Fibers and Textiles — *Cambridge, MA*

IACMI (The Composites Institute) — Advanced Composites — *Knoxville, TN*

LIFT (The National Advanced Materials and Manufacturing Innovation Institute) — Materials — *Detroit, MI*

REMADE Institute — Sustainable Manufacturing — *Rochester, NY*

DIGITAL/AUTOMATION

America Makes — Additive Manufacturing — *Youngstown, OH; El Paso, TX*

ARM Institute — Advanced Robotics — *Pittsburgh, PA*

CESMII (The Smart Manufacturing Institute) — Smart Manufacturing — *Los Angeles, CA*

CyManII (the cybersecurity manufacturing innovation institute) — Cybersecurity in Manufacturing — *San Antonio, TX*

MxD (The Digital Manufacturing & Cybersecurity Institute) — Digital Manufacturing — *Chicago, IL*

BIOMANUFACTURING

BioFabUSA — Regenerative Manufacturing — *Manchester, NH*

BioMADE — Bioindustrial Manufacturing — *St. Paul, MN*

NIMBL — Biopharmaceutical Manufacturing — *Newark, DE*

ENERGY/PROCESSES

EPIC (Electrified Processes for Industrial eXCellence) — Electrified Industrial Processes — *Tempe, AZ*

RAPID (Transforming Process Industries) — Modular Chemical Process Intensification — *New York, NY*

Manufacturing USA Annual Network Impacts

Annual Impacts *FY 2024*

Work with
3,100+
Member Organizations

Collaborate on
870+
major applied research and development projects

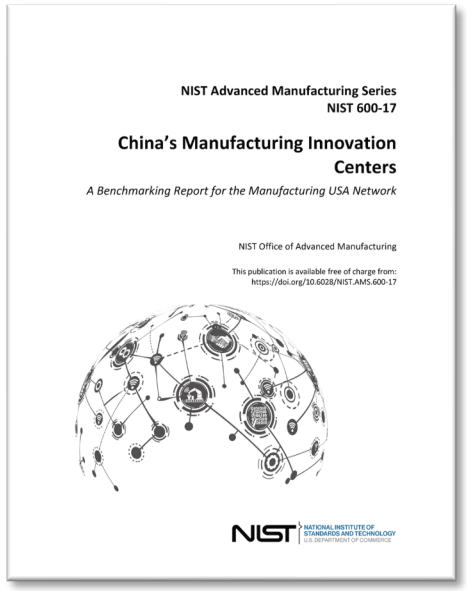
Engage
206,700+
people with workforce knowledge and skills in advanced manufacturing

Invest
$526.4M
in these activities from state, industry, and federal funds

Our efforts help ensure **what's invented here is made here by a skilled American workforce.**

NIST Office of Advanced Manufacturing 2025 Publications

China's Manufacturing Innovation Centers



Manufacturing USA 2025 Strategic Plan

Manufacturing USA Competency Framework

Manufacturing USA Annual Report

MFG USA: Technology Transition Roadmaps

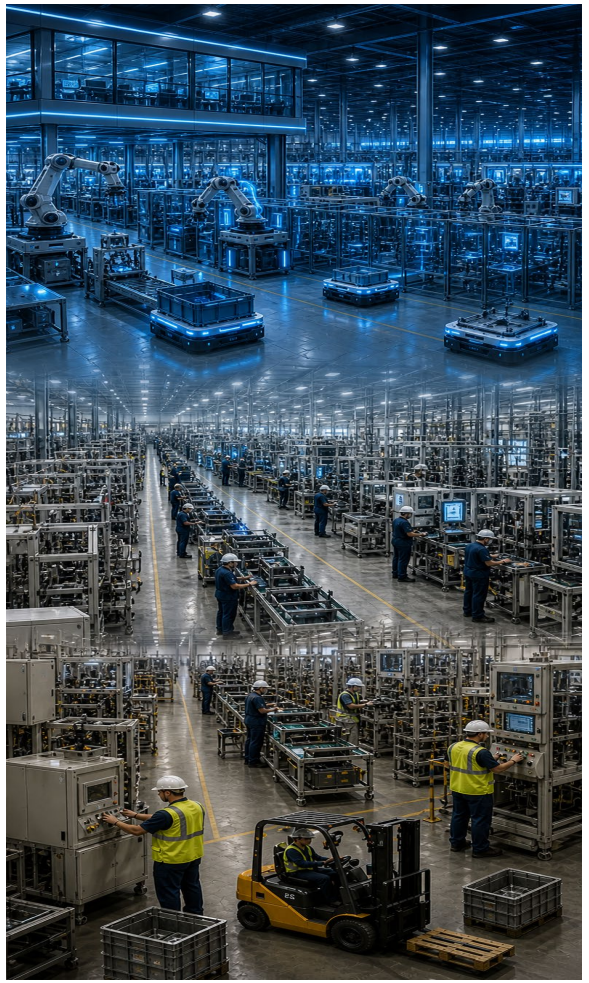
Competitive pilot program to develop **actionable roadmaps** for transitioning technologies from pilot-scale to commercial-scale production

MFG USA Institutes will detail how **scaling and commercializing technology** will meaningfully impact domestic manufacturing

Outline essential infrastructure, resources, capabilities, and partnerships necessary to navigate scale-up and deployment of manufacturing innovations

Specifics:

- Eligibility limited to existing Manufacturing USA institutes
- Multiple awards, each not to exceed $550,000



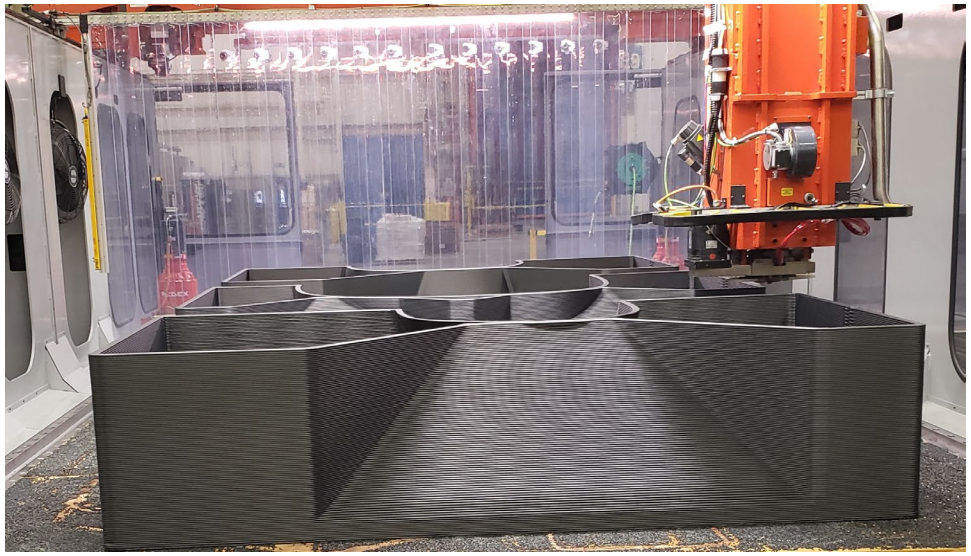
Credit: Perplexity

Manufacturing Extension Partnership

VISION: Enhance the productivity and technological performance in United States manufacturing

MISSION: Strengthen and empower small- and medium-sized U.S. manufacturers through state-designated MEP Centers located across the U.S. and Puerto Rico

Credit: Shutterstock



Credit: Thermwood

MEP Program Characteristics

Centers **across the U.S.** and **in Puerto Rico**

Public-private partnership with **national reach** and **local support**

Leverages partners to maximize impact

Transfer technology and expertise to manufacturers

Support **workforce development** for the skills needed in advanced manufacturing

Support **supply chains** and **supplier scouting** (SCOIN pilot program)

MEP: Technology Acceleration Pilot

- Competitive pilot program to accelerate the adoption and commercialization of advanced manufacturing technologies
- Development and validation of **shared technology frameworks** to:
  - Accelerate advanced manufacturing methods, or
  - Defragment supply chains into robust networks
- Topics
  - **Additive manufacturing** for aerospace components
  - A domestic **critical minerals** supply chain


Credit: Technion


Credit: Takemaru Hirai


Credit: Trevor Paulhus, WSJ

Thank you

www.nist.gov

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