U.S. DEPARTMENT OF
ENERGY

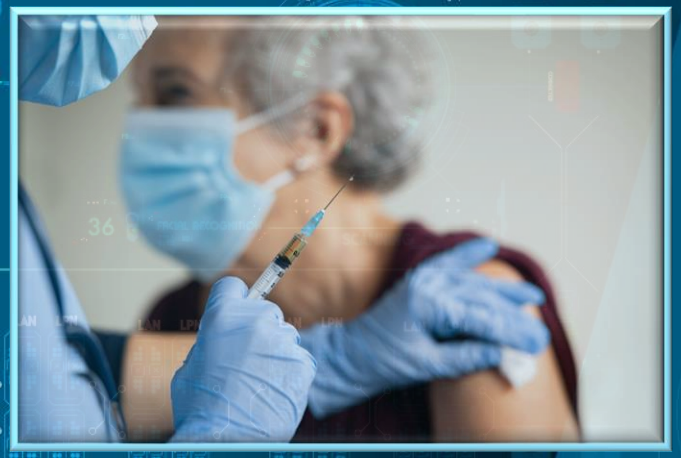
Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

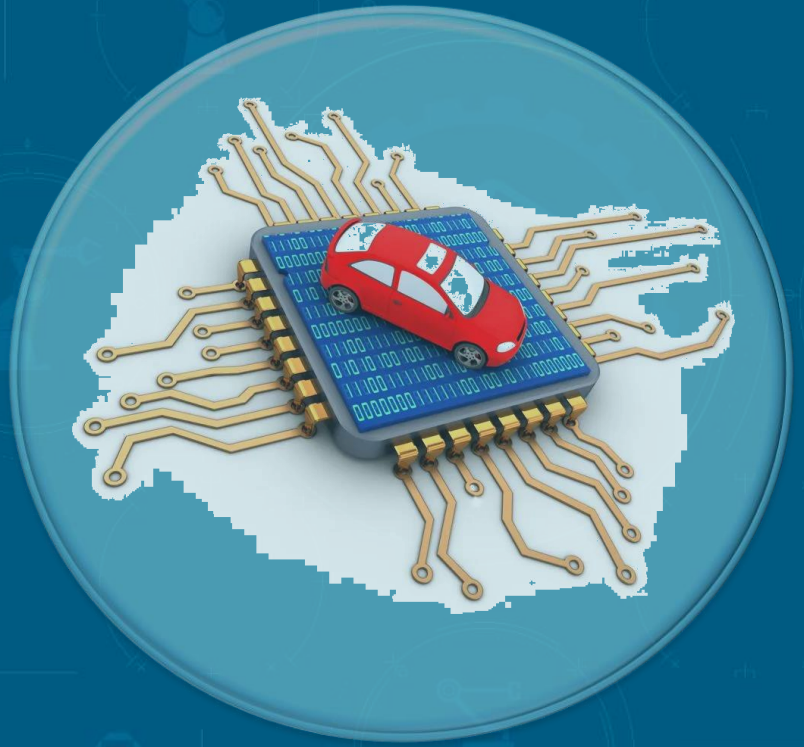
ADVANCED MATERIALS &
MANUFACTURING
TECHNOLOGIES OFFICE

Dr. Huijuan Dai
Program Manager

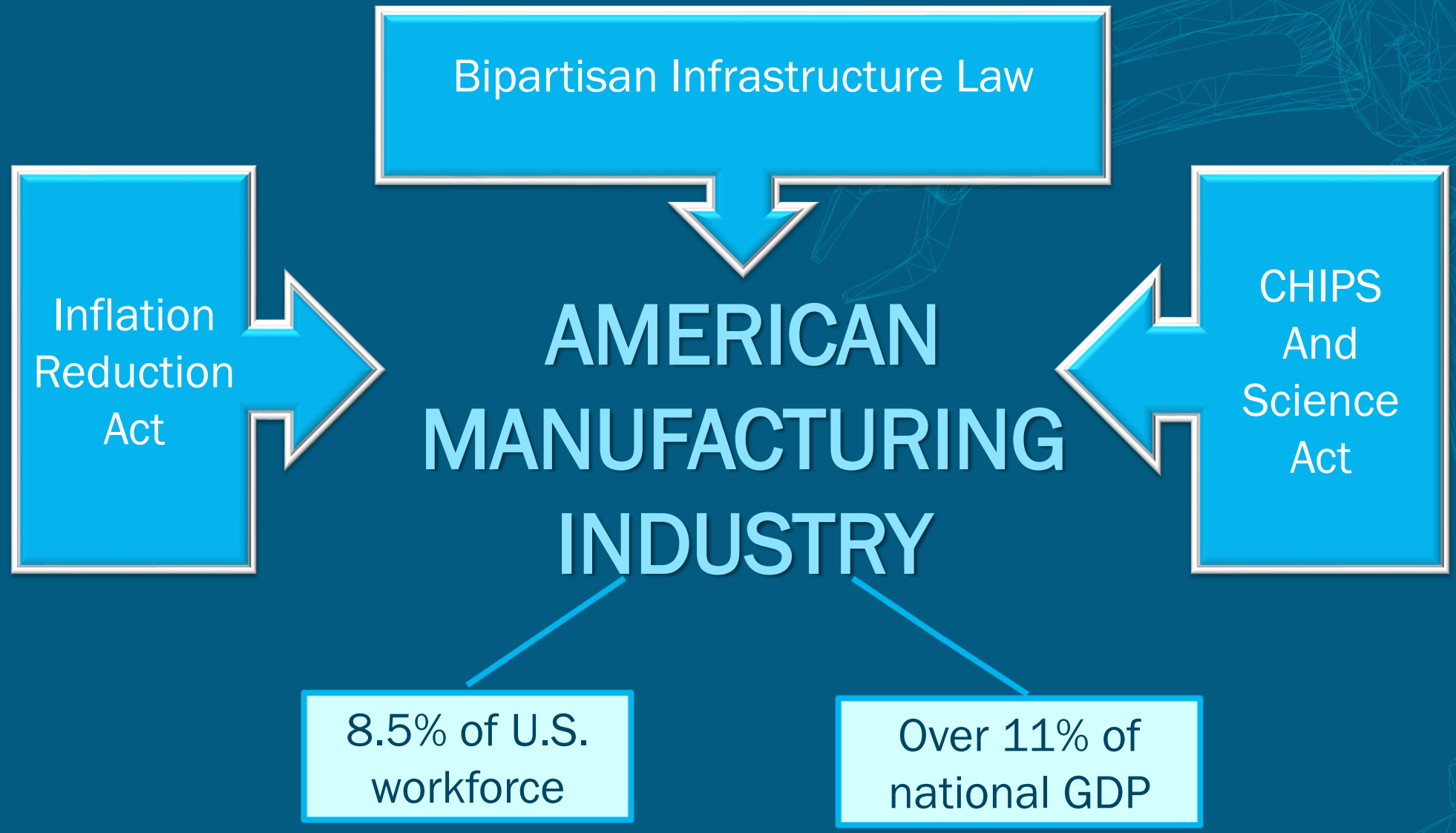
Advancing DOE's Clean Energy Goals for the Next Generation Materials and Processes

The World is Changing...





Unprecedented Federal Investment in Manufacturing



Advanced Manufacturing Office (AMO) is Now:

AMMTO

Advanced Materials and Manufacturing Technologies Office

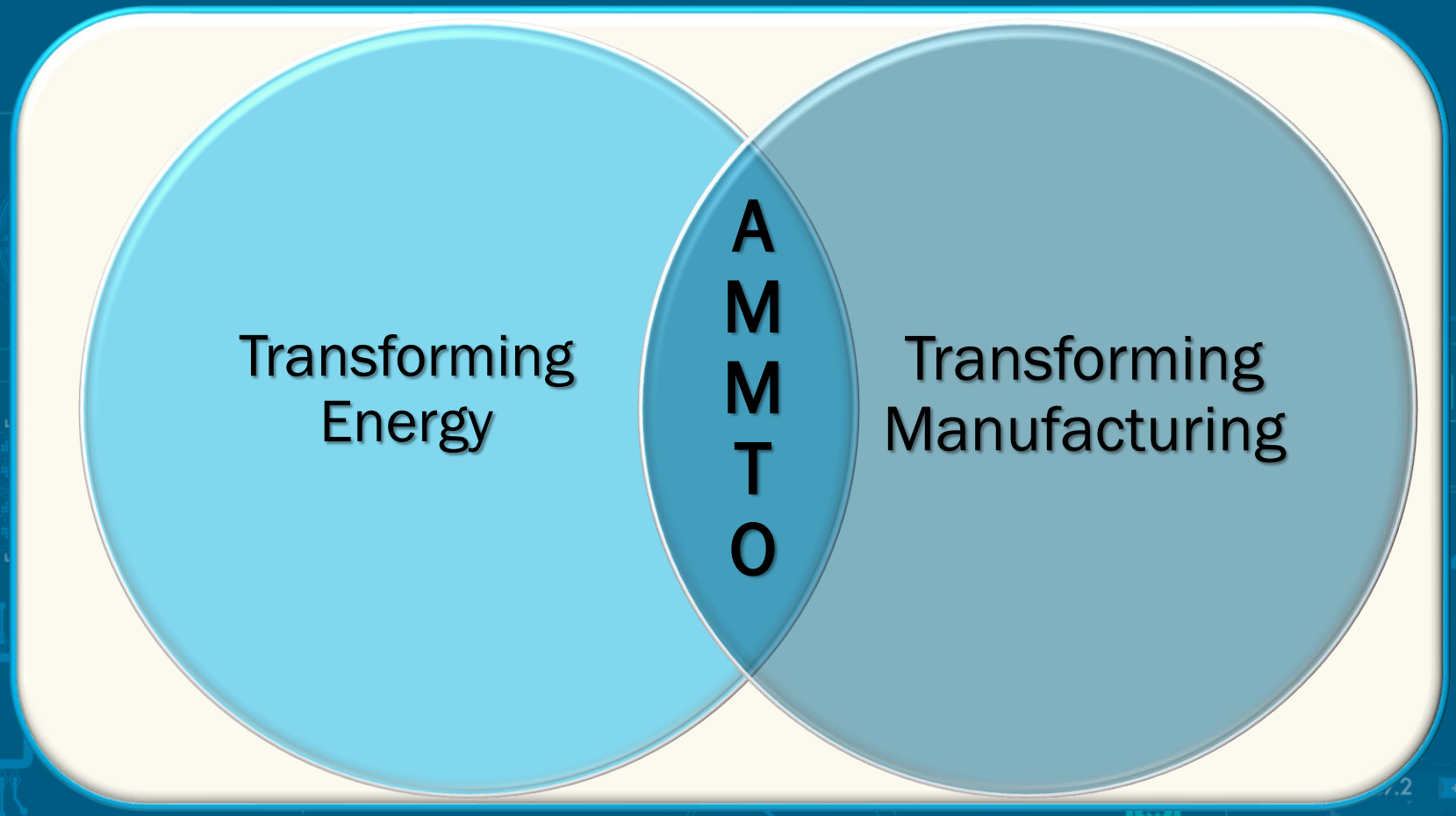
Inspire people and drive innovation to transform materials and manufacturing for America's energy future.

IEDO

Industrial Efficiency and Decarbonization Office

Lead the development and accelerate the adoption of sustainable technologies that increase efficiency and eliminate industrial greenhouse gas emissions.

AMMTO's Unique Role in American Manufacturing



How can advanced manufacturing materials and processes help our nation to meet this critical moment and advance clean energy solutions?

The Right Time for AMMTO

Technology Innovation

Inspire People

Transform Materials and Manufacturing

Vision

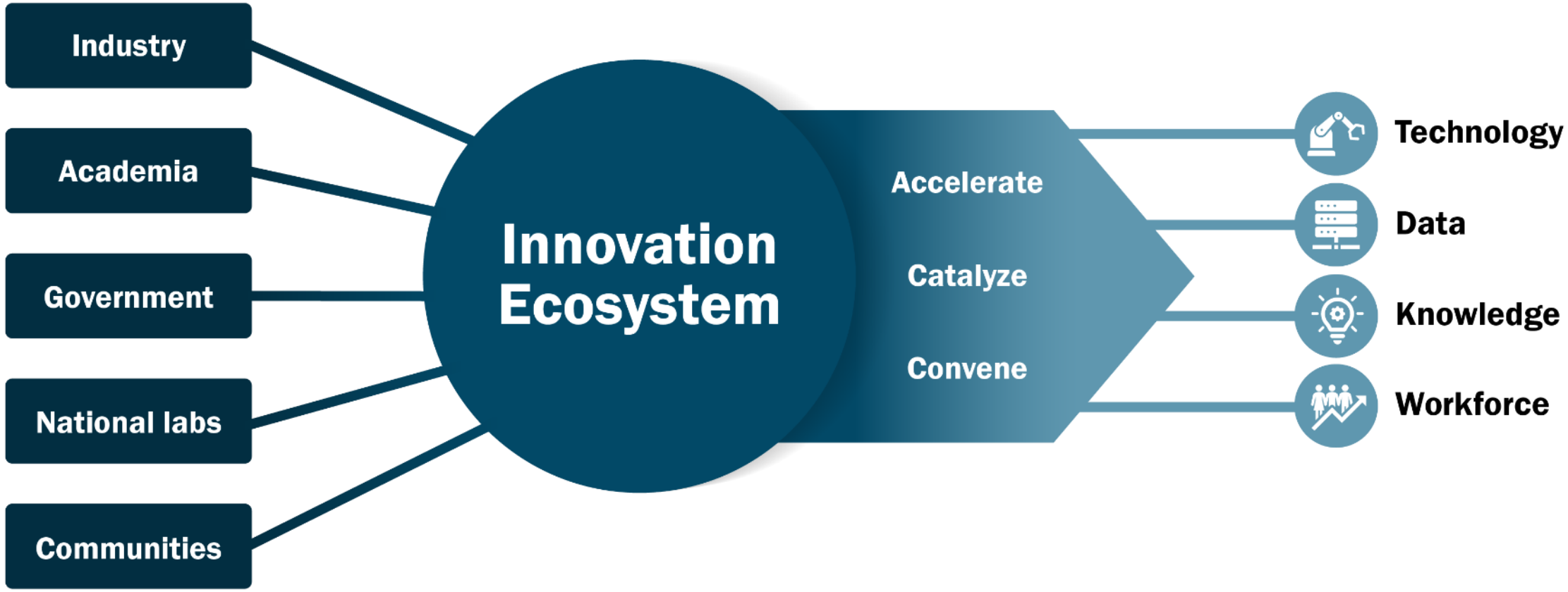
A globally competitive U.S. manufacturing sector that accelerates the adoption of innovative materials and manufacturing technologies in support of a clean, decarbonized economy.

Mission

We inspire people and drive innovation to transform materials and manufacturing for America's energy future.

Innovation Ecosystems

The evolving set of stakeholders, resources, and activities—and the relationships and connections among them—that drive technological advancement.

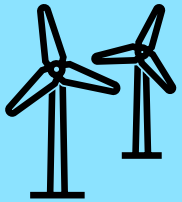


Consortia Seed Innovation Ecosystems

AMMTO's Subprogram Structure

NEXT-GENERATION MATERIALS & PROCESSES

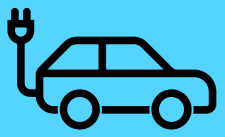
Advanced Manufacturing Processes and Systems



High Performance Materials

SECURE & SUSTAINABLE MATERIALS

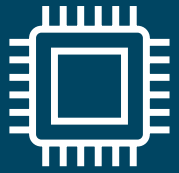
Circular Economy Technologies and Systems



Critical Materials

ENERGY TECHNOLOGY MANUFACTURING & WORKFORCE

Energy Conversion and Storage Manufacturing



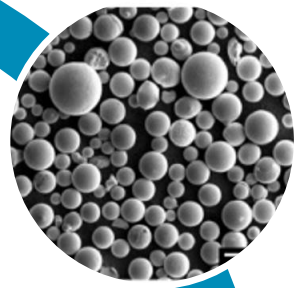
Semiconductors, Electronics, and Other Technologies Manufacturing

Entrepreneurial Ecosystems and Advanced Mfg. Workforce

Next Generation Materials and Processes (NGMP) Program

Objective: Support AMMTO mission through development of novel materials and manufacturing processes.

NGMP



High Performance Materials

- Novel materials have improved properties that improve the functionality, extend product lifetime, increase lifecycle energy and materials efficiency
- Composites, Materials for Harsh Service Conditions, Conductive-enhanced Materials
- 41 Projects ($96M)
- RD&D Consortia: IACMI, MDF, CFTF

Advanced Processes

- Additive Manufacturing, Near Net Shape Manufacturing, Roll-to-Roll Manufacturing, Modelling & Manufacturing for Lightweight Structure, System Integration
- 13 Projects ($28M)
- RD&D Consortia: IACMI, MDF, CFTF

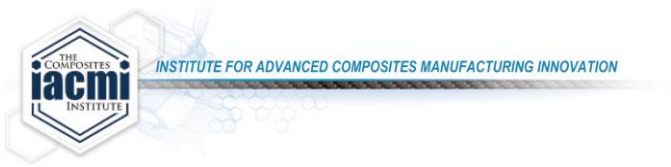
Digital Manufacturing

- Smart Manufacturing, Cyber Security, High Performance Computing
- 4 Projects ($1M)
- RD&D Consortia: CESMII, CYMANII, MDF
- National Strategy for Smart Manufacturing

Enhance Material Properties and Energy Efficiency of Manufacturing, Improve the Resiliency of Domestic Supply Chains

Advanced Materials and Processes - 2023 Priorities ($74M)

Prior Investments



- **Portfolio includes:**
  - Materials for harsh service conditions.
  - Roll-to-Roll Consortium.

FY23 Focus

- **Build momentum from prior investments**
  - CABLE prize success led to the development of the thermally conductive material topic.
  - Developed a phased strategy for University of Maine, which is now poised to have more impact and accelerate progress.
- **Focus on the unique role of AMMTO in developing manufacturing capabilities.**
  - Advancing the frontier of manufacturing
  - Enabler for application-specific work
  - Focus on manufacturing competitiveness
- **Finalize investment strategies for CFTF and materials for harsh service conditions.**

Look Ahead

- **Implemented strategies to optimize impact of long-term investments** (e.g., MDF, CFTF).
  - Internally and externally vetted
  - Clear entry and exit / transition strategies for technologies
- **Established identity:** AMMTO relied upon for materials and manufacturing technologies through connections and transitions to partner EERE offices

Digital Manufacturing - 2023 Priorities ($16M)

Prior Investments

- Portfolio emphasizes technology and resource development for a broad community to increase accessibility to **smart and cybersecure manufacturing**.
- Portfolio includes **High-Performance Computing for Manufacturing.**

FY23 Focus

- **Completion of the National Plan for Smart Manufacturing.**
- **Strengthen integration between CESMII, CYMANII, and other AMMTO efforts**
  - Smart manufacturing and cybersecurity are cross-cutting and could be more fully utilized across the office
- **Use CESMII renewal as an opportunity to reassess focus and fill in gaps identified in the National Plan, where appropriate.**

Look Ahead

- Affordable access to Smart Manufacturing Technologies for SMMs.
- Strong connection between smart manufacturing, cybersecurity, and other aspects of sustainable manufacturing.
- Resilient and secure supply chains in US Manufacturing.
- System level optimization of manufacturing enterprise using smart manufacturing technologies.

BOTTOM LINES

- The future of the nation and the world are dependent on manufacturing and energy.
- We are adapting our portfolio to meet the moment and best serve the nation.
- In doing so, we are fulfilling the commitments of our national leadership.
- Collaboration is essential to making this happen.
- We need all hands on deck to achieve our goals!

Thank you!

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