Advancing DOE’s Clean Energy Goals for the Next Generation Materials and Processes
The World is Changing...
Unprecedented Federal Investment in Manufacturing

Inflation Reduction Act

AMERICAN MANUFACTURING INDUSTRY

8.5% of U.S. workforce

Bipartisan Infrastructure Law

CHIPS And Science Act

Over 11% of national GDP
Advanced Manufacturing Office (AMO) is Now:

**AMMTO**
Advanced Materials and Manufacturing Technologies Office

**IEDO**
Industrial Efficiency and Decarbonization Office

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

**RAPIDLY ACCELERATE**
domestic production and manufacturing of clean energy technology

**DRASTICALLY REDUCE**
carbon emissions across the industrial sector and economy

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

**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.
## AMMTO’s Subprogram Structure

<table>
<thead>
<tr>
<th>NEXT-GENERATION MATERIALS &amp; PROCESSES</th>
<th>SECURE &amp; SUSTAINABLE MATERIALS</th>
<th>ENERGY TECHNOLOGY MANUFACTURING &amp; WORKFORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Manufacturing Processes and Systems</td>
<td>Circular Economy Technologies and Systems</td>
<td>Energy Conversion and Storage Manufacturing</td>
</tr>
<tr>
<td>High Performance Materials</td>
<td>Critical Materials</td>
<td>Semiconductors, Electronics, and Other Technologies Manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Entrepreneurial Ecosystems and Advanced Mfg. Workforce</td>
</tr>
</tbody>
</table>
Next Generation Materials and Processes (NGMP) Program

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

**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

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