U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

ADVANCED MATERIALS & MANUFACTURING TECHNOLOGIES OFFICE

Advanced Materials and Manufacturing Technologies Office (AMMTO)

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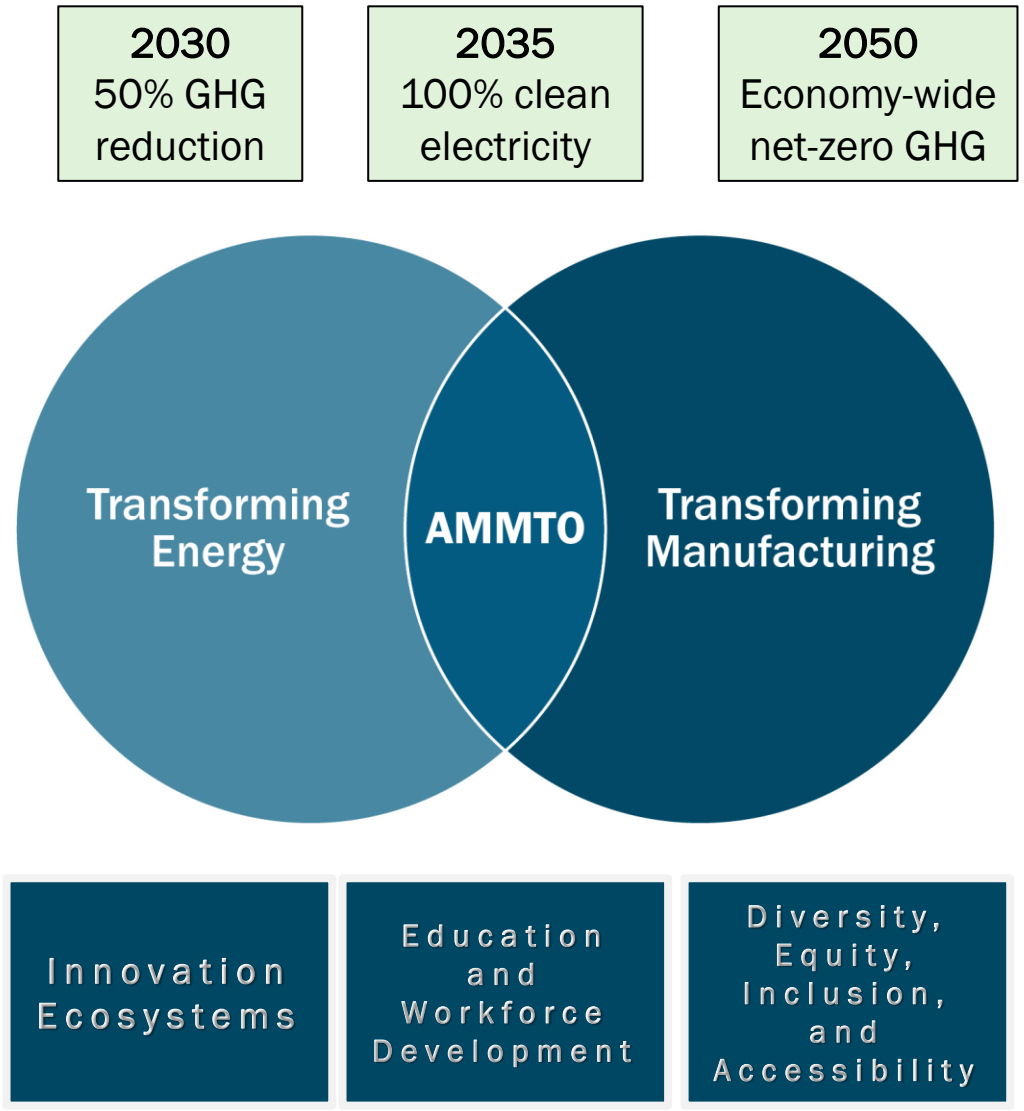
https://www.energy.gov/eere/ammto

Advanced Materials and Manufacturing Technologies Office

- **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.



Advanced Materials and Manufacturing Technologies Office

Supporting Clean Energy Manufacturing

Batteries and long duration storage
Wind turbines and wind blades
Hydropower components
Castings/forgings
Industrial motors
Hydrogen storage
High efficiency conductors
Power electronics
Microelectronics
…

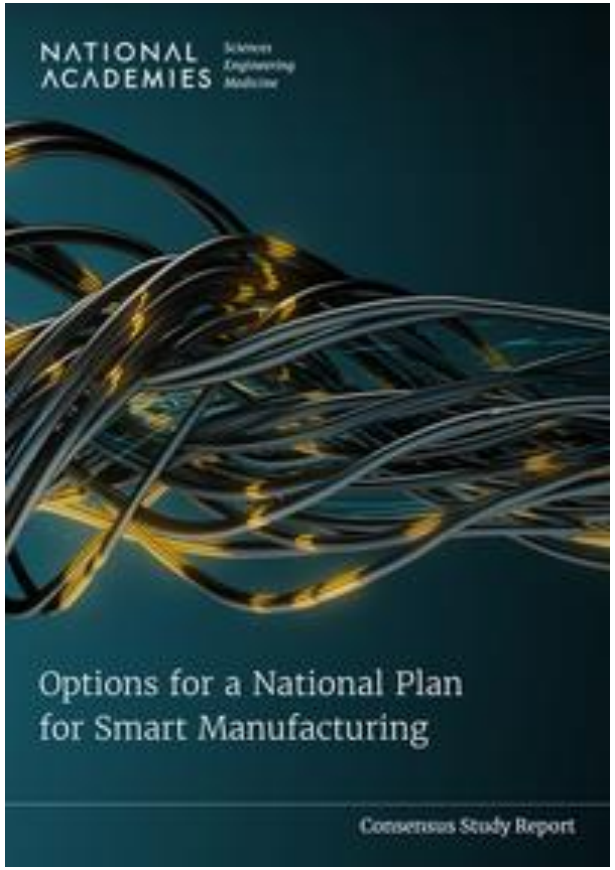
Platform Manufacturing Technologies, Advanced Materials, Workforce

- Manufacturing Technologies: smart manufacturing, AI/ML, cybersecurity, high performance computing, roll-to-roll manufacturing, additive manufacturing, circularity
- Advanced Materials: advanced composites/metals/ceramics, critical materials, high conductivity metals, harsh service condition materials
- Workforce: training programs, curricula development, entrepreneurship

AMMTO-funded NASEM Smart Manufacturing Study

AMMTO supported the 'Options for a National Plan for Smart Manufacturing' study by the National Academies for Science, Engineering, and Mathematics (NASEM)

- Addresses challenges to improve the quality, productivity, and efficiency of the manufacturing sector of the United States and ensure U.S. competitiveness.
- Examines technical frameworks and processes,
- Identifies possible timelines and necessary resources,
- Explores policies and general roles for government, industry, and academia



AMMTO is currently developing a National Strategy for Smart Manufacturing informed by this study.

Critical Material Accelerator

CRITICAL MATERIALS COLLABORATIVE
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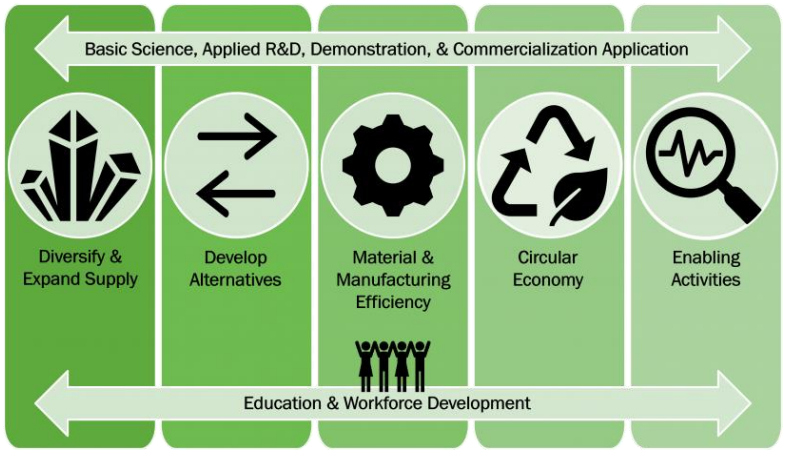
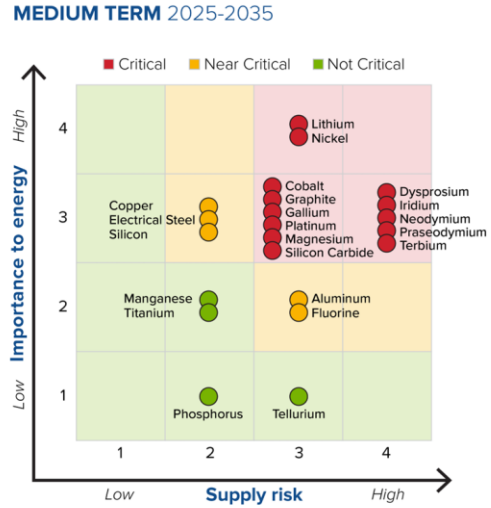
DOE Critical Minerals and Materials Strategic Pillars





Topic 1a
Critical Material Lean/Free Magnets for Clean Energy Technologies

Topic 1b
Motors and Drivetrains using Critical Material Lean/Free Magnets

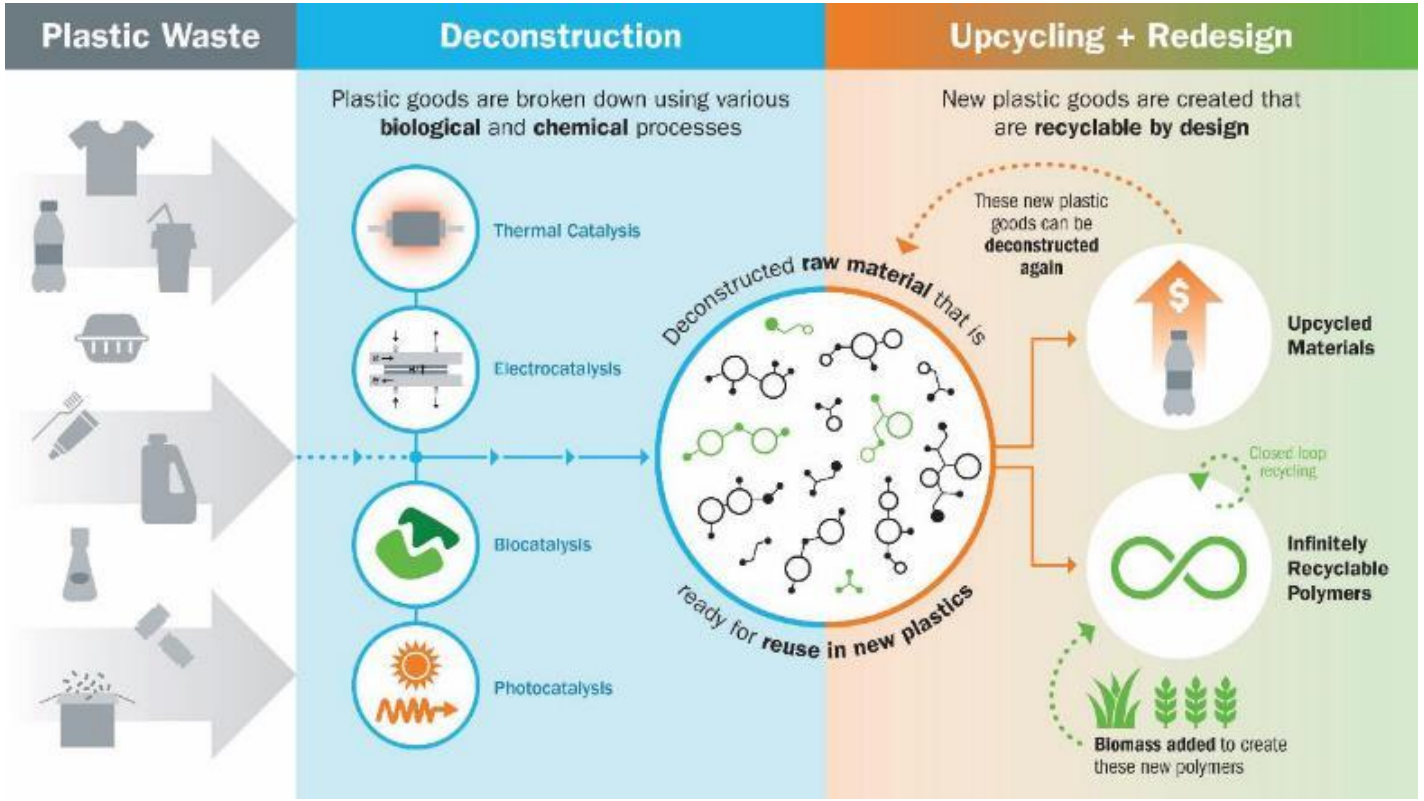
Topic 2
Improved Unit Operations of Processing and Manufacturing of Critical Materials

Topic 3
Critical Material Recovery from Scrap and Post-Consumer Products

Topic 4
Reduced Critical Material Demand Economy Wide

Lab-Led Consortia: BOTTLE Consortium

- **Mission:** develop robust processes to upcycle waste plastics and develop new plastics that are recyclable-by-design.
- **Lead:** NREL
- **Metrics include:**
  - >50% energy savings relative to virgin material production
  - >75% carbon utilization from waste plastics
  - >2x economic incentive above price of reclaimed materials
- Learn more at www.bottle.org



Argonne NATIONAL LABORATORY · Los Alamos NATIONAL LABORATORY EST. 1943 · NREL Transforming ENERGY · OAK RIDGE National Laboratory · SLAC NATIONAL ACCELERATOR LABORATORY

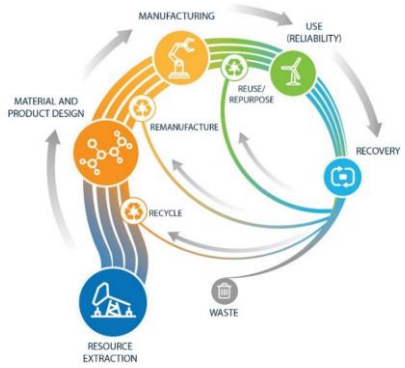
Colorado State University · Massachusetts Institute of Technology · MONTANA STATE UNIVERSITY · Northwestern University · UNIVERSITY OF PORTSMOUTH

bottle
changing the way we recycle
U.S. DEPARTMENT OF ENERGY

Two Circular Economy Prize Competitions

Re-X Before Recycling Prize

- Goals
  - Spur new connections along the value chain
  - Engage more diverse performers
  - Demonstrate and socialize new innovations to valorize waste and extend product and part useful life
  - Enable new and expanded Re-X supply chains



E-SCRAP Prize

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- Goals
  - Recover critical materials from E-scrap
    - Capitalize on recent process innovation
    - Increase recovery efficiency and economics
    - Reduce waste environmental impacts
    - Extend lifetime of critical materials
    - Displace virgin feedstocks

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Needed for industrial electrification & conversion to hydrogen as a fuel

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Let's connect and find ways to work together!

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- **Chris Saldaña & Diana Bauer** (christopher.saldana@ee.doe.gov, diana.bauer@ee.doe.gov)
  - Strategic collaborations, consortia/stakeholder engagement, interagency coordination
- **Kate Peretti – Secure & Sustainable Materials PM** (kathryn.peretti@ee.doe.gov)
  - Circular economy, critical materials
- **Huijuan Dai – Next Generation Materials & Processes PM** (huijuan.dai@ee.doe.gov)
  - High performance materials (composites, metals, ceramics), additive manufacturing, smart manufacturing, high performance computing
- **Tina Kaarsberg – Energy Tech. Mfg. & Workforce PM** (tina.kaarsberg@ee.doe.gov)
  - Semiconductor manufacturing, power electronics, battery manufacturing, education and workforce development innovation, lab embedded entrepreneurship