U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Advanced Manufacturing Office

Valri Lightner, Deputy Director, Advanced Manufacturing Office

manufacturing.energy.gov

Electricity Advisory Committee
February 27, 2020

Manufacturing's Role in the ESGC

GOAL

U.S. global leadership in energy storage utilization and exports with a **secure domestic manufacturing supply chain independent of foreign sources of critical materials**

DOE FOCUS

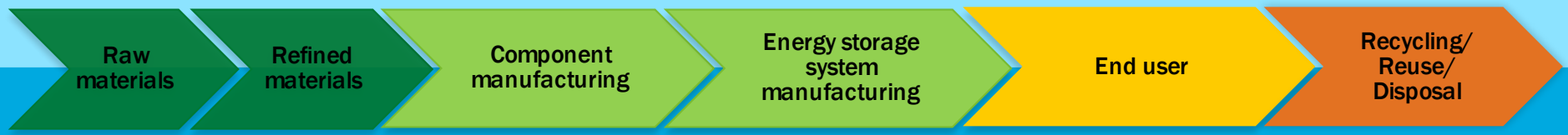
Accelerate scale-up of **emerging manufacturing processes**

Improve **critical materials supply chain** resilience

Address **technical barriers** in production and manufacturing

Exploring Technologies & Supply Chains

Meeting the ESGC goal will require a combination of research and technology development across the manufacturing supply chain.



R&D AREAS

- Manufacturing process intensification
- Critical materials use & sourcing
- Roll-to-roll manufacturing capabilities
- Membrane manufacturing processes
- New materials & manufacturing processes for harsh service environments
- Water desalination & purification
- Combined Heat & Power systems

POTENTIAL TECHNOLOGIES

- Flow batteries
- Thermal energy storage
- Lithium-based batteries
- Non-lithium-based solid state batteries
- Hydrogen generation & storage
- Compressed air energy storage
- Pumped hydro
- Synthetic fuels (e.g. synbiogas)
- And others

DOE Education & Workforce Development Efforts

GOAL

Develop training and education programs to ensure a sufficient pipeline of workers who can **research, design, develop, manufacture, and operate energy storage systems**

FOCUS

- Broaden awareness of existing programs
- Perform a needs assessment to determine gaps
- Develop new programs modeled on existing, successful DOE activities

4

DOE Education & Workforce Initiatives

HIGH SCHOOL

- National Science Bowl® competitions

UNDERGRAD

- Community College Internships Program
- Science Undergraduate Laboratory Internships Program

GRADUATE

- Graduate Student Research Program
- Interdisciplinary and industrially-relevant traineeships

Energy Storage Internship Program

FACULTY

- Visiting Faculty Program for under-represented institutions
- Curriculum development for degree programs

WORKFORCE

- Lab-Embedded Entrepreneurship Program
- Industrial Assessment Centers undergraduate training *(31 universities)*
- Community college hands-on training

5

Upcoming Stakeholder Workshops

March 6: Seattle, Washington

March 10: Austin, Texas

March 16: Chicago, Illinois*

March 17: Chicago, Illinois

March 26: Washington, D.C.

***Manufacturing-specific session**

For additional information and to subscribe for updates:

energy.gov/eere/amo/advanced-manufacturing-office.

Please send questions, comments, or suggestions to info.amo@ee.doe.gov.

Questions to Explore

1. What are the most pressing challenges for scaling up the manufacture of energy storage systems?
2. What are the most pressing challenges to maintaining a strong, fully domestic supply chain for energy storage?
3. How difficult would it be to combine two or more of the technologies into a single, hybrid energy storage system?
4. Which DOE technical focus area do you think would provide the most impact for energy storage technology development and manufacturing?
5. What energy storage manufacturing and supply chain policies are needed to establish and maintain manufacturing capacity within the U.S. to supply the U.S. demand?
6. What workforce needs do you see related to the development, manufacture, or operation of energy storage systems?