


U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

AMO Overview: Peer Review 2015 Opening / Welcome

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Clean Energy and Manufacturing: Nexus of Opportunities

- Energy self-reliance
- Stable, diverse energy supply

- Competitiveness in clean energy
- Domestic jobs

- Clean air
- Climate change
- Health

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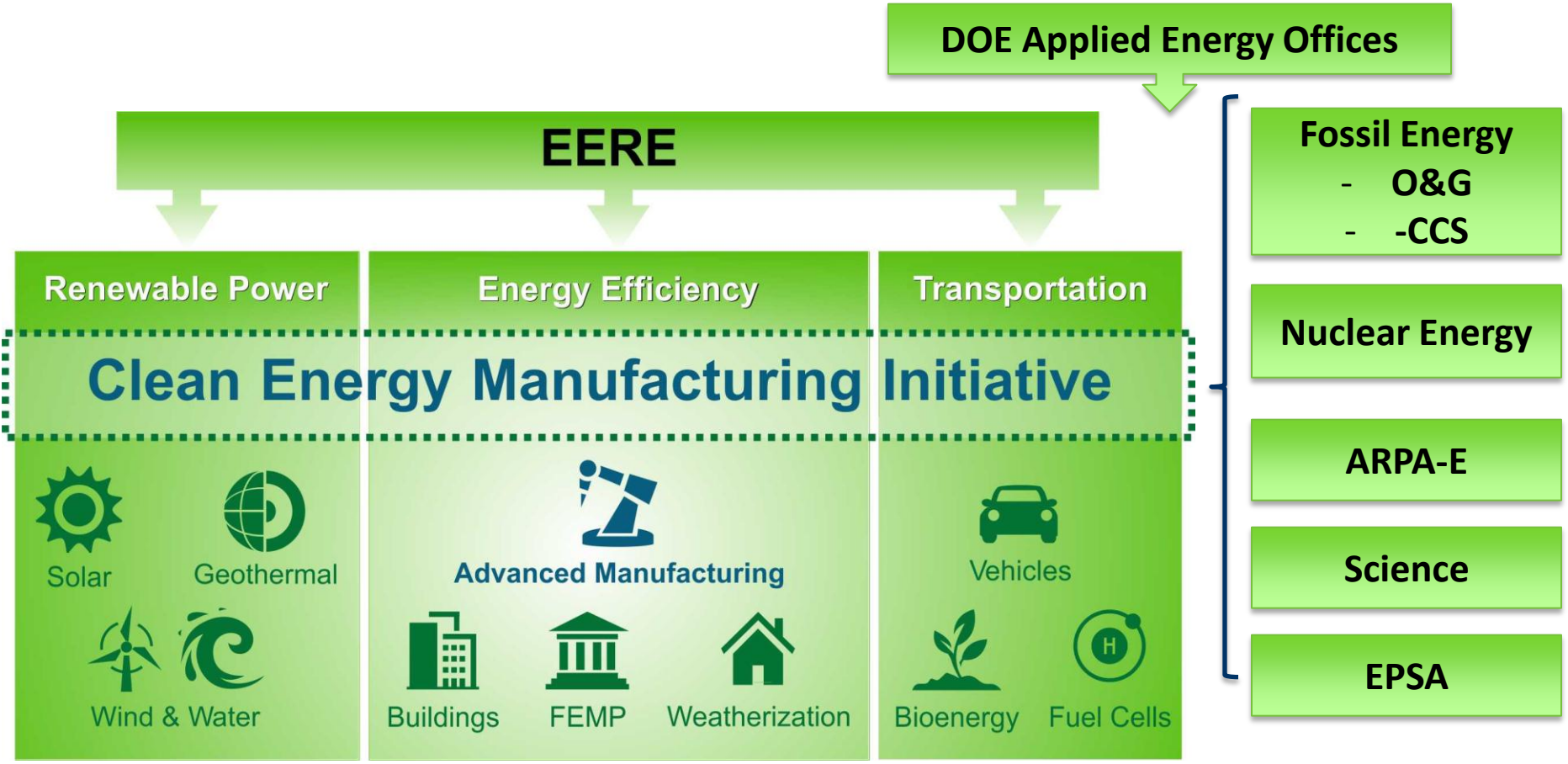
Clean Energy Manufacturing Initiative – Across DOE



Collaboration toward:

- Common goal to collectively ***increase U.S. manufacturing competitiveness***

Coordination for:

- Comprehensive Strategy
- Collaborative Ideas

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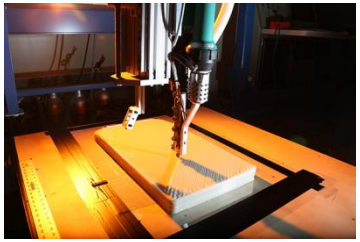
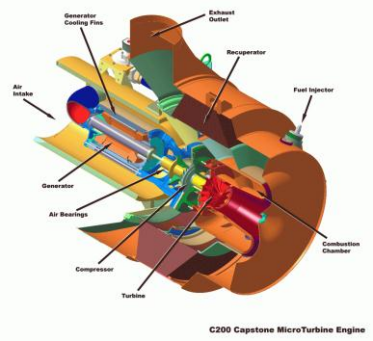
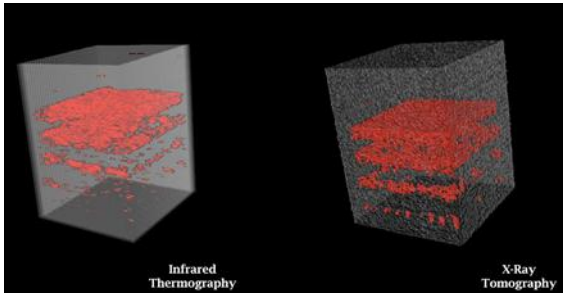


Additive Manufacturing of Large Area Structures for Energy



Advanced Microturbine Systems for Distributed Generation and CHP



Computational Modelling, Infrared Detection and Tracking of Voids and Defects in High Performance Alloys

AMO's Purpose is to Increase U.S. Manufacturing Competitiveness and Energy Efficiency through:

- **Broadly Applicable Efficiency Technologies for Energy Intensive and Energy Dependent Manufacturing**

  Examples: combined heat and power (CHP), efficient manufacturing process intensification, energy management and process controls, sustainable resources

- **Platform Materials and Process Technology Innovations for Manufacturing Advanced / Clean Energy Technologies**

  Examples: carbon fiber composites; critical materials; advanced materials manufacturing; high performance simulation, visualization and modelling, wide bandgap semiconductors/power electronics, additive manufacturing

Modalities: **Technology Assistance**
Technology Development (Projects & Facilities)

Energy Intensive Industries

Primary Metals
1608 TBTU

Petroleum Refining
6137 TBTU

Chemicals
4995 TBTU

Wood Pulp & Paper
2109 TBTU

Glass & Cement
716 TBTU

Food Processing
1162 TBTU

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Processes for Clean Energy Materials & Technologies

Energy Dependence: Energy Cost Considered in Competitive Manufacturing

Solar PV Cell

Carbon Fibers

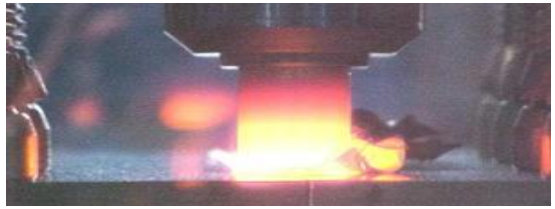
Light Emitting Diodes

Electro-Chromic Coatings

Membranes

EV Batteries

Multi-Material Joining



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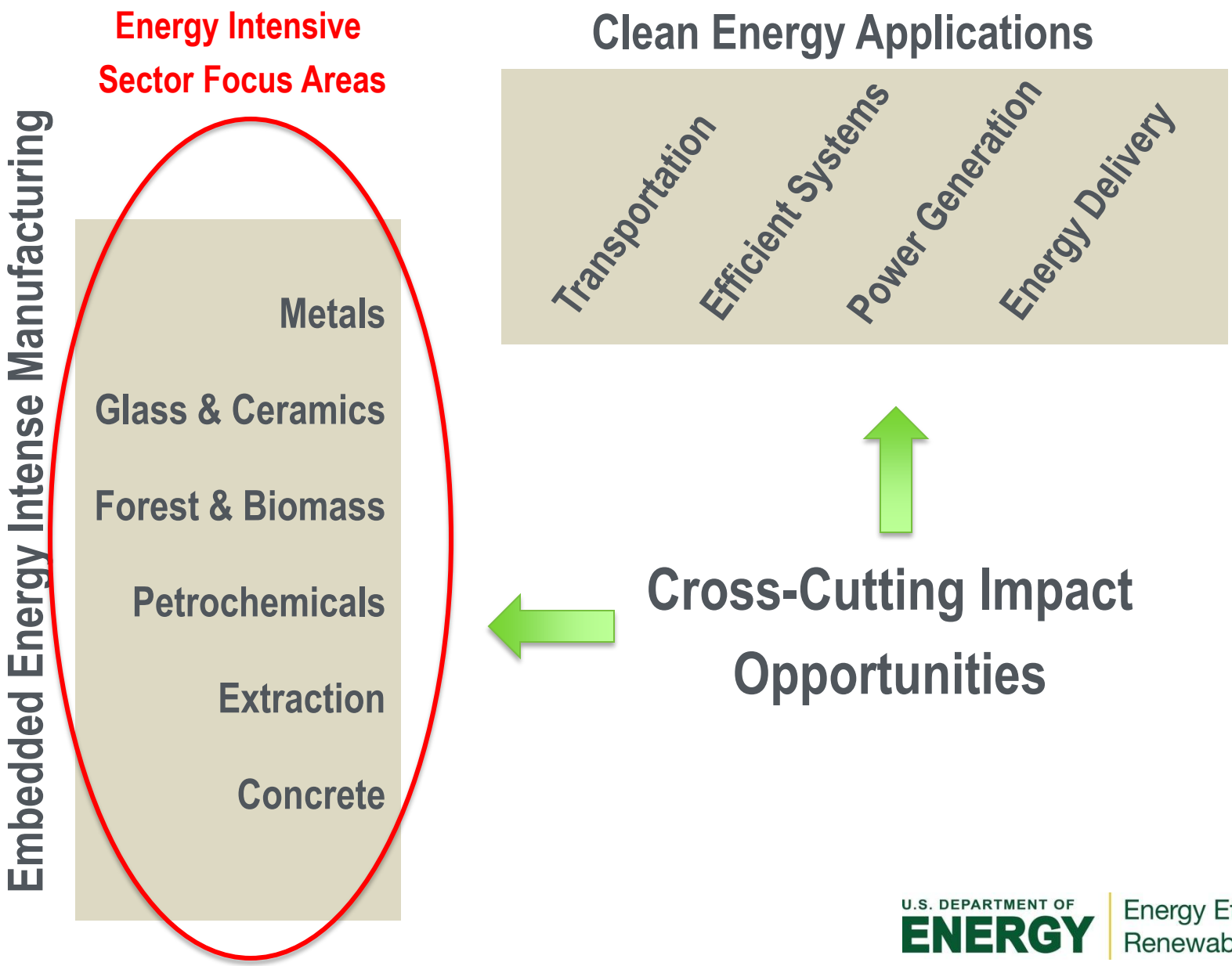
Manufacturing Sector Whitespace



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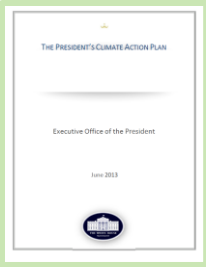
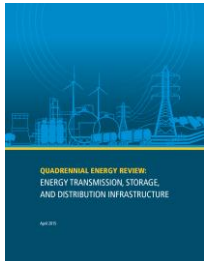
Advanced Manufacturing – Policy Framing

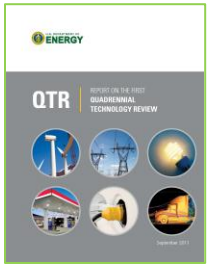


Climate Action Plan
(EOP / CEQ / OSTP 2014)

Advanced Manufacturing Partnership (AMP2.0)
(NEC / PCAST / OSTP 2014)



Quadrennial Energy Review
(DOE / EPSA 2015)



Quadrennial Technology Review
(DOE / Science and Technology 2015)

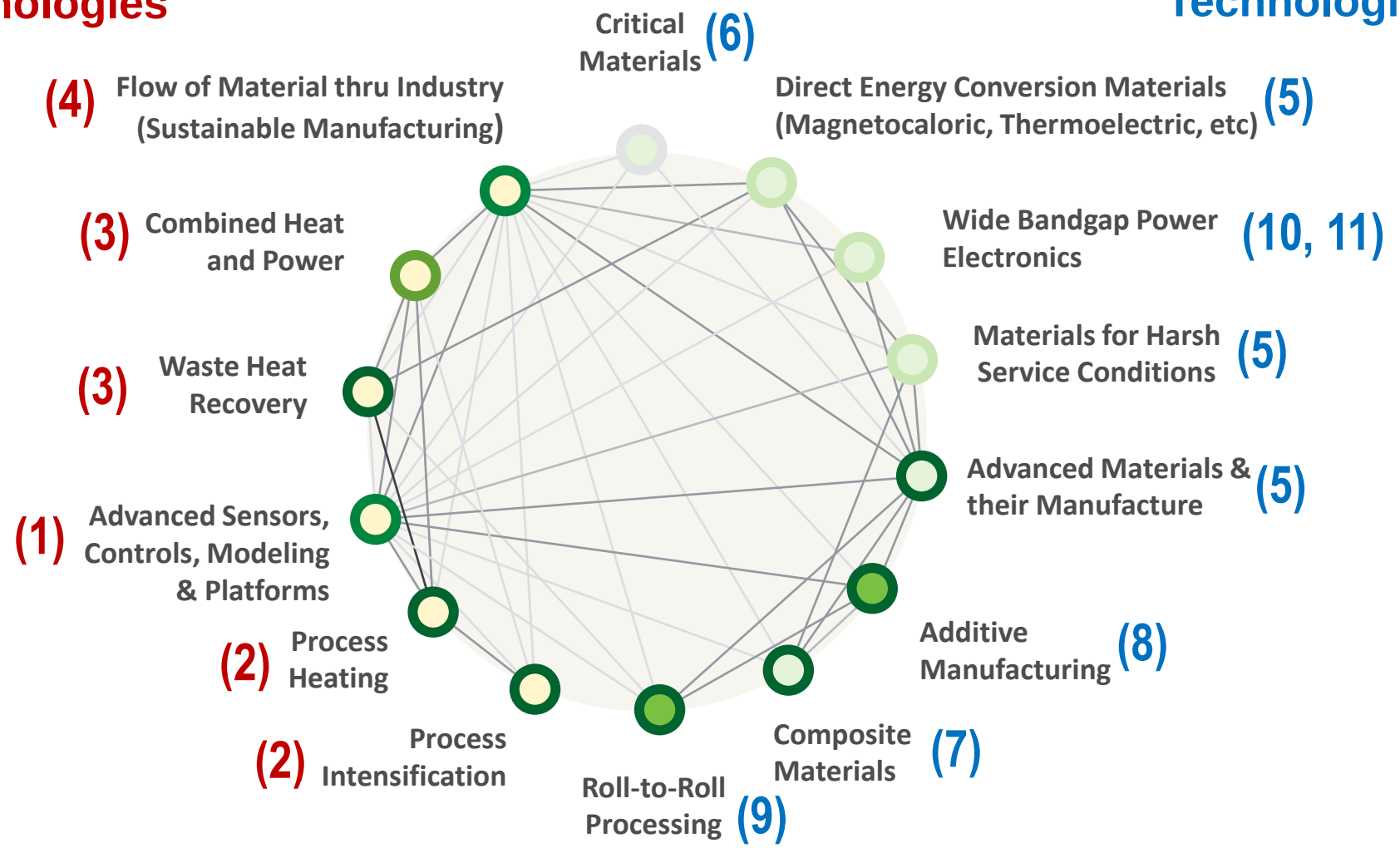
1) Broadly Applicable Efficiency Technologies for Energy Intensive and Energy Dependent Manufacturing

2) Platform Materials & Processes Technologies for Manufacturing Clean Energy Technologies

QTR Chapter 8: Manufacturing Technology Areas

Efficiency Technologies

Enabling Platform Technologies



Advanced Manufacturing Topical Priorities

Efficiency Technologies for Manufacturing Processes (Energy, CO_2)

(1) Advanced Sensors, Controls, Modeling and Platforms (HPC, Smart Manf.)
(2) Advanced Process Intensification
(3) Grid Integration of Manufacturing (CHP and DR)
(4) Sustainable Manufacturing (Water-Energy, New Fuels & Feedstocks)

Platform Materials & Technologies for Clean Energy Applications

(5) Advanced Materials Manufacturing
(incl: Extreme Mat'l., Conversion Mat'l, etc.)
(6) Critical Materials
(7) Advanced Composites & Lightweight Materials
(8) 3D Printing / Additive Manufacturing
(9) 2D Manufacturing / Roll-to-Roll Processes
(10) Wide Bandgap Power Electronics
(11) Next Generation Electric Machines (NGEM)

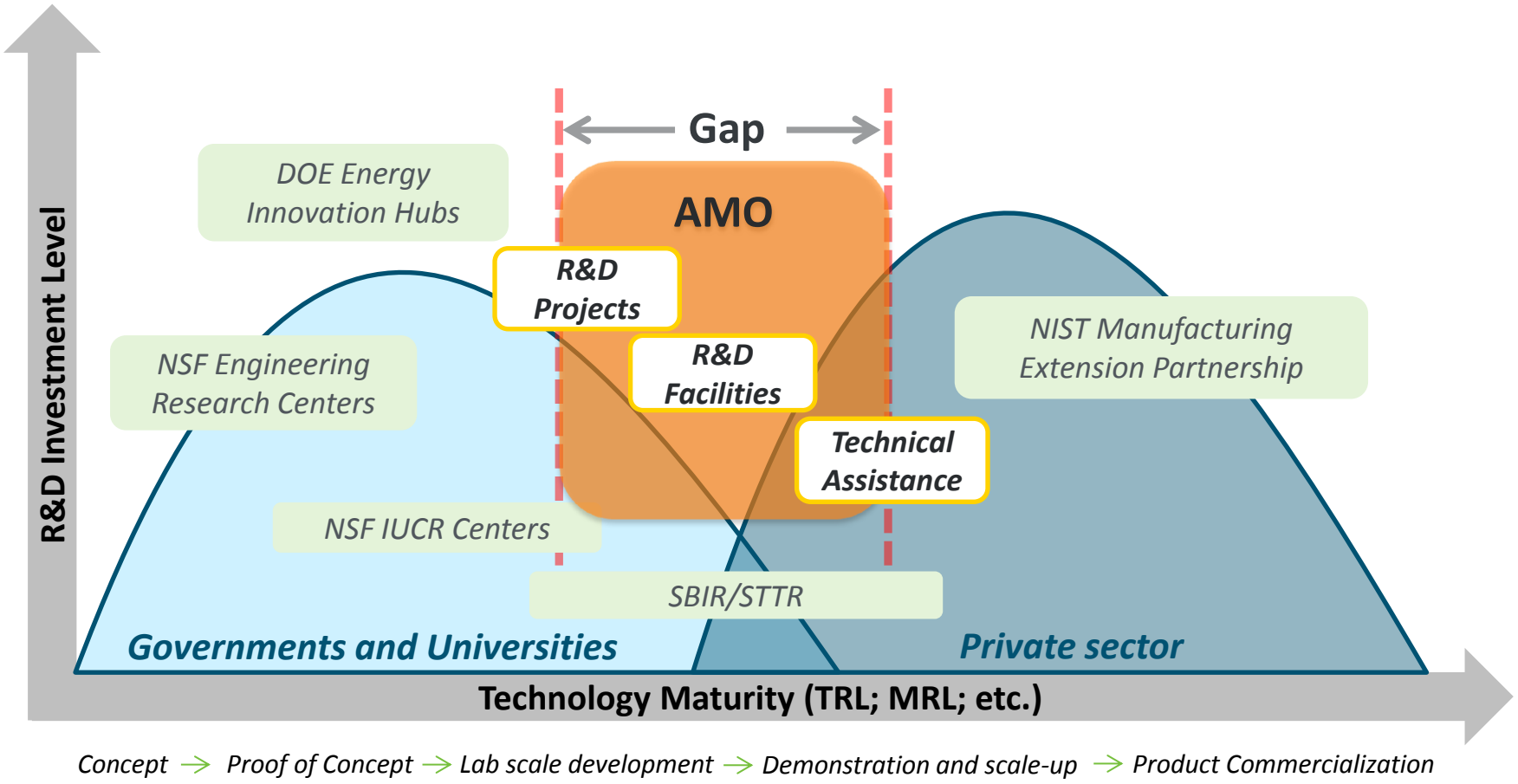
QTR Manufacturing (Ch.8) Focus Areas Mapped to Advanced Manufacturing Topical Areas for Technology Development

Possible Impact Areas of Cross-Cutting Technology for Energy Intensive Industry Sectors

		Chemicals & Bio-chemicals	Petroleum Refining	Primary Metals	Forest & Food Products	Clean Water
SMART Manufacturing		●	●	●	●	●
Process Intensification		●	●		●	●
CHP & Grid Integration		●	●	●	●	●
Sustainable Manufacturing		●		●	●	

Bridging the Gap to Manufacturing

AMO: Advanced Manufacturing Office



Modalities of Support

Technology Assistance: (Dissemination of Knowledge Gaps)

Better Plants, ISO-50001 / SEP, Industrial Assessment Centers, Combined Heat and Power Tech Assistance Centers, Energy Management Tools & Training

Technology Development Facilities: (Innovation Consortia)

Critical Materials Hub, Manufacturing Demonstration Facility (Additive), Power America NNMI, IACMI NNMI, CyclotronRoad, HPC4Manufacturing

Technology Development Projects: (Individual R&D Projects)

Individual Projects Spanning AMO R&D Space - University, Small Business, Large Business and National Labs. Each a Project Partnership (Cooperative Agreement).

What does Success Look Like?

Energy Products Invented Here…

…And Competitively Made Here!

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