

# HTAC Briefing

## *Clean Energy Manufacturing Initiative*



U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

Libby Wayman  
Director, Clean Energy Manufacturing Initiative

# Outline

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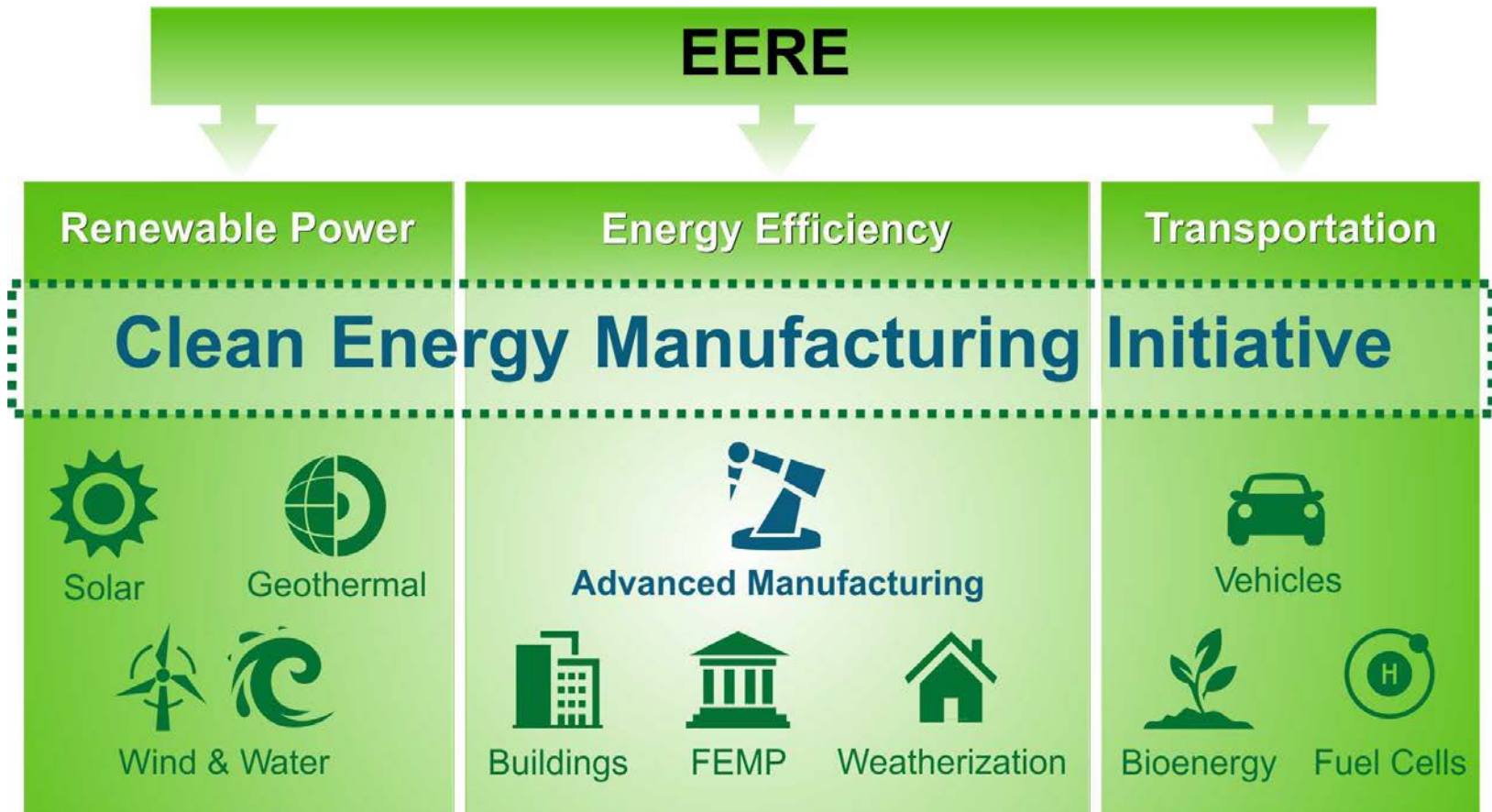
- Brief update on the Clean Energy Manufacturing Initiative
- Overview of ideas under development for your consideration

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# EERE Clean Energy Manufacturing Initiative



Collaboration toward:

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

Coordination for:

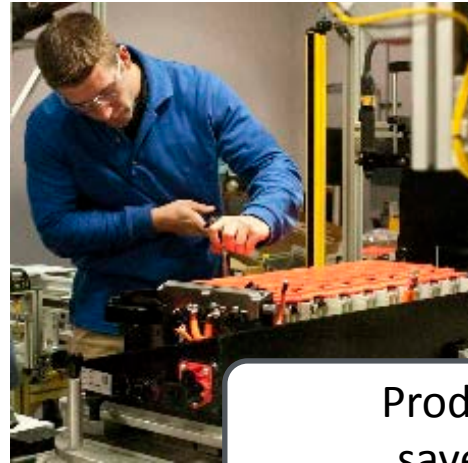
- Clean Energy Manufacturing Strategies
- National Clean Energy Mfg Programs

# EERE Clean Energy Manufacturing Initiative: 2 Objectives

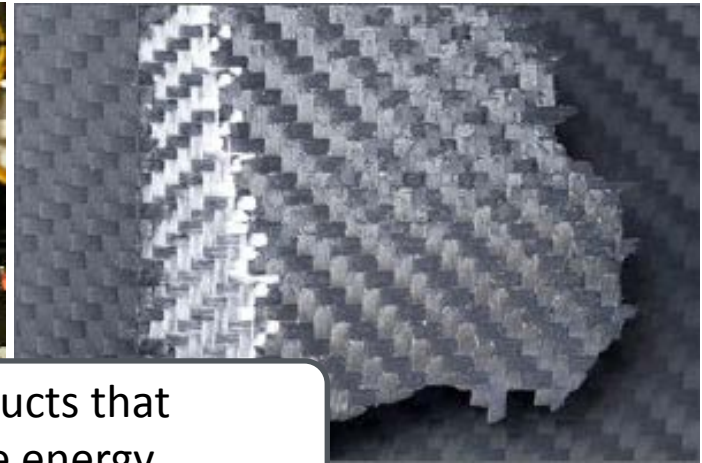
## 1. Increase U.S. competitiveness in the production of clean energy products



Products that generate clean energy



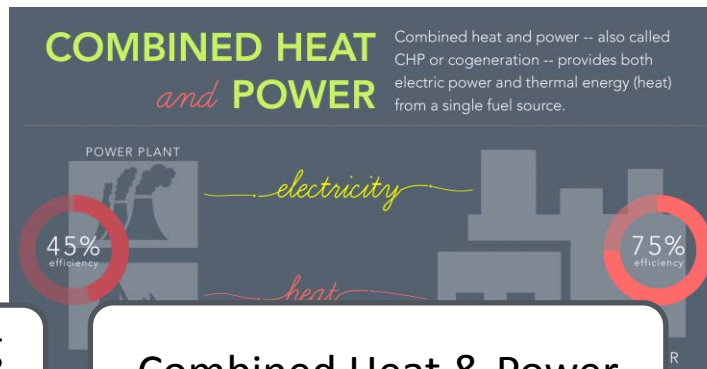
Products that save energy



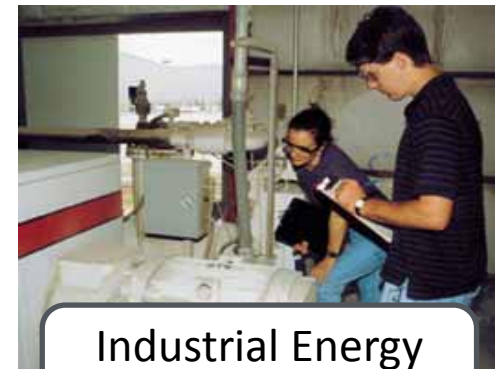
## 2. Increase U.S. manufacturing competitiveness across the board by increasing energy productivity



Advanced Manufacturing Technologies



Combined Heat & Power



Industrial Energy Efficiency

# EERE Clean Energy Manufacturing Initiative: Portfolio

*Official launch on March 26, 2013*

## Key Components of Initiative

1. Manufacturing R&D
2. Facilities for Manufacturing Innovation & Demonstration:
  - Carbon Fiber (Oak Ridge, TN)**
  - America Makes (Youngstown, OH)**
  - Wide Band Gap Power Electronics Manufacturing Institute**
  - Others...**
3. Energy Productivity
4. Competitiveness analysis/strategies
5. Partnerships & engagement



# EERE CEMI Year 1 Highlights

- Office Accomplishments:
  - AMO: IMI projects selected and announced
  - AMO: First NNMI Institute selected and announced, 2<sup>nd</sup> solicitation released
  - AMO: CHP-TAPs selected and announced
  - Solar: SolarMat projects selected and announced
  - Wind: Major manufacturing chapter as part of the Wind Vision
  - WIP: Clean Energy Manufacturing planning grants selected and announced
  - Buildings: LED manufacturing workshop
  - Better Plants: Partners' energy savings surpassed \$1Billion!
- Cross-Cutting Technology Accomplishments:
  - Carbon Fiber cross-cut established
- Cross-Cutting Analysis Accomplishments:
  - Established "Competitiveness Analysis" framework, applied to 5 technology areas
- Cross-Cutting Partnership & Program Accomplishments:
  - 48C: Recipients selected and announced
  - American Energy & Manufacturing Competitiveness Partnership: Held 4 dialogues, resulted in development of the Manufacturing Partners Program and other ideas
- Cross-Cutting Engagement:
  - Regional Summits: Held first Regional Summit in Toledo OH
  - National Summit: Held first National Summit in Washington DC

# DOE Clean Energy Manufacturing Initiative

→ CEMI Expanded DOE-wide, carried out by “Tech Team”

## Clean Energy Manufacturing Tech Team

Office of Fossil

EIA

Intelligence and  
Counter-  
Intelligence

Office of  
Electricity

EPSA

National Nuclear  
Security Agency

ARPA-E

Loan Program  
Office

Office of Science

Nuclear

Economic Impact  
and Diversity

EERE



# DOE Clean Energy Manufacturing Initiative: 2 Objectives

## 1. Increase U.S. competitiveness in the production of clean energy products



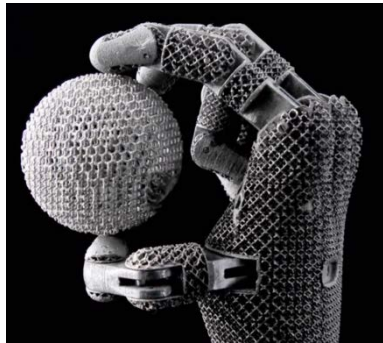
Products that generate clean energy



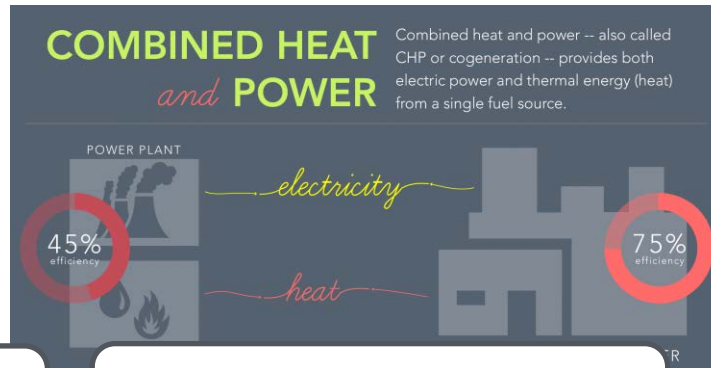
Products that save energy



## 2. Increase U.S. manufacturing competitiveness across the board by leveraging energy productivity and low-cost domestic fuels and feedstocks



Advanced Manufacturing Technologies



Combined Heat & Power



Industrial Energy Efficiency

# Deliverables & Timeline – DOE CEM Tech Team

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Existing Portfolio	<ul style="list-style-type: none"> <li>Budget Cross-cut Inventory</li> <li>Collaboration Proposal</li> </ul>			<ul style="list-style-type: none"> <li>Inventory National Lab capabilities</li> </ul>								
Identify Needs & Opportunities				<ul style="list-style-type: none"> <li>DOE-Internal Workshop on needs and ideas</li> <li>Scope Competitive Analysis in each Office</li> </ul>								
Create DOE Manufacturing Strategy				<ul style="list-style-type: none"> <li>Draft DOE-wide manufacturing strategy, detailing DOE approach to increasing manufacturing competitiveness</li> </ul>								
Develop & Leverage Resources				<ul style="list-style-type: none"> <li>Develop Budget &amp; Collaborations</li> <li>◆ May 1: Initial Budget Proposal due</li> </ul>								
Engagement	<ul style="list-style-type: none"> <li>AEMC Summit</li> <li>Create complete engagement calendar</li> </ul>			<ul style="list-style-type: none"> <li>DOE-wide participation in CEMI engagement events:                             <ul style="list-style-type: none"> <li>◆ Western Summit</li> <li>AEMC Dialogue</li> <li>National Summit ◆</li> </ul> </li> </ul>								

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# Ideas Under Development

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- Tier 1: Programs Under Development
  - Manufacturing Partner in Residence Program
  
- Tier 2: Nascent Ideas
  - Materials Acceleration Partnership
  - Clean Energy Manufacturing Scale-up Partnership(s)
  - HPC & Modeling & Simulation
  
- Tier 3: Blank Page

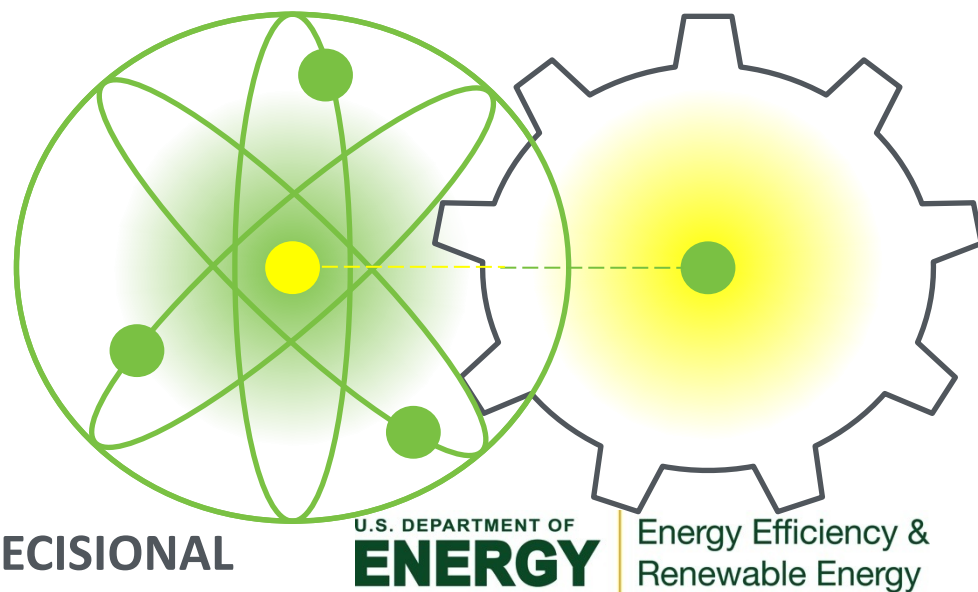
## “National Lab Manufacturing Partners” Program”

**Pilot:** The “Lab-Manufacturing Partners” program will build on and extend existing National Lab “industry fellows” effort. EERE will support exchanges of “embedded” researchers from Labs to industry and vice-versa. Focus around specific problem/opportunity.

**Motivation:** Two of EERE top priorities

- Increasing U.S. clean energy manufacturing competitiveness
- Increase commercially relevant research at the National Laboratories in the EERE mission space

**Goals:** Catalyze strong Lab-Industry relationships that result in significant growth in high-impact Lab-Industry research agreements

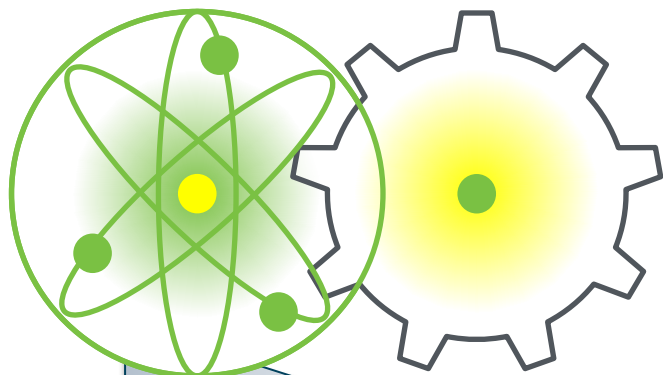


# Program Components & Responsibilities

**FY14 Budget:** \$2M for ~ 5 fellow-pairs for ~2 yrs

**Approach:** Create high-profile partnership for technical leadership from National Labs and the Private Sector to work together to identify industry-relevant challenges and National Lab resources to address them.

**Focus:** Initial focus on industry challenges to advance manufacturing competitiveness.



## Teaming

### Industry Day Workshops

Lab Scientists

Private Sector Technologists

#### Teams

- **Lab Partners:** find solutions to private sector challenges not met using company-internal resources.
- **Private Sector Partners:** engage laboratory expertise and resources on technical problems in the private sector

#### Team Work

- Identify challenges that can benefit from leveraging lab resources
- Gain insight into private sector priorities
- Develop long-term trusted relationships

#### Small Company Engagement

- Increase access to resources at national labs for a broad community of manufacturers
- Promote energy innovation within supply chains for increased competitiveness

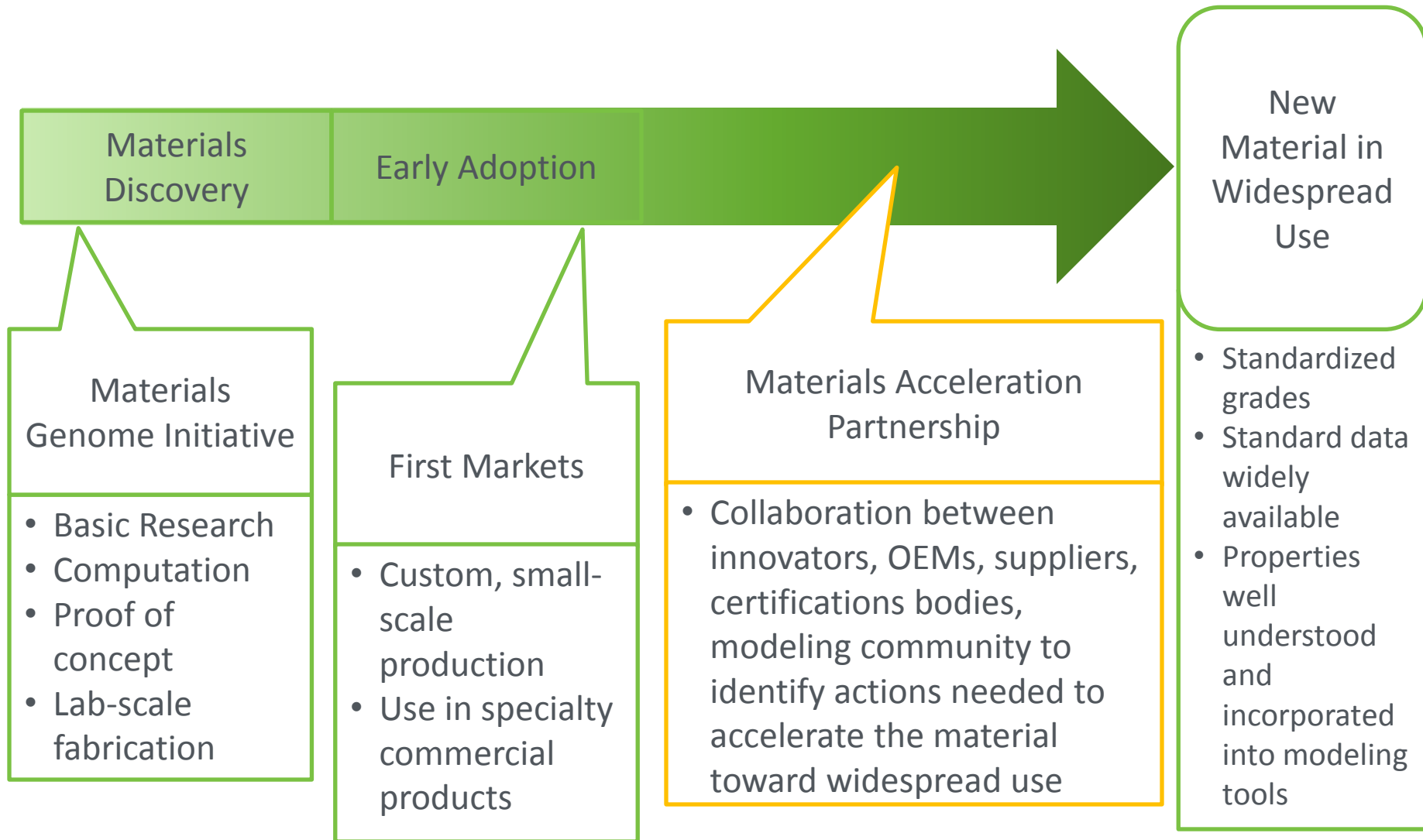
#### Council of Partners

- Help spread best practices among national labs and across industry sectors
- Create and manage relationships that hasten advanced manufacturing technologies into the market

# Open Questions

1. What are the elements of the program that are most important (for the pilot and the long term)?
  - Lab Partners
  - Private sector Partners
  - Supply Chain Engagement
  - Council of Manufacturing Partners
  - Host organizations
  - CRADAs
2. What is the best way to benefit small and medium-sized companies?
3. How should Partners be funded?
4. What should the duration of the Partnerships be?
5. What are metrics of success?
6. What should we call this?
7. How to focus, and have broad impact?

# Materials Acceleration Partnership



PREDECISIONAL



# Illustrative Materials and Barriers Addressed

	Materials Properties Catalog and Data	Need for Better Characterization	Need for Modeling, Simulation, and Design Tools	Need for Standards	Need for Process Validation and Qualification
Carbon Fiber		X	X	X	X
Composite Materials	X	X			
Solar-Grade Silicon					
Membranes (Fuel Cells)				X	
Membranes (HVAC)					
Aluminum		X	X	X	X
Magnesium		X	X	X	X

**Preliminary Internal Data<sup>x</sup>  
To be validated with external input**

# Clean Energy Manufacturing Scale-up Partnership

- Objectives:
  - Provide capital to scale up innovative technologies
  - Ensure that investments are aligned with industry and public sector needs
  - Facilitate connections between innovators and strategic investors
  - Leverage federal capital
- Concepts:
  - Joint Solicitations / Competition
  - Joint Scale-up Equity Fund
  - Joint Deployment Fund
  - Supply Chain Challenge
  - Supply Chain Financing Partnership

# Clean Energy Manufacturing Initiative: *Big Idea*

- ***High Impact***
- ***Additionality***
- ***Openness***
- ***Enduring Economic Benefit***
- ***Proper Role of Government***
- ***Need-Driven***: Addresses core challenges not being met
- ***Opportunistic***: Takes advantage of key resources & opportunities
- ***Actionable***: Achievable with tools and authorities already at our disposal
- ***Transformative***: Changes the game for U.S. competitiveness in Clean Energy Manufacturing
- ***Non-linear***: Multiplicative impact of public-sector capital
- ***Collaborative***: Greater impact if executed across multiple technologies

# Contact

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[elizabeth.wayman@ee.doe.gov](mailto:elizabeth.wayman@ee.doe.gov)