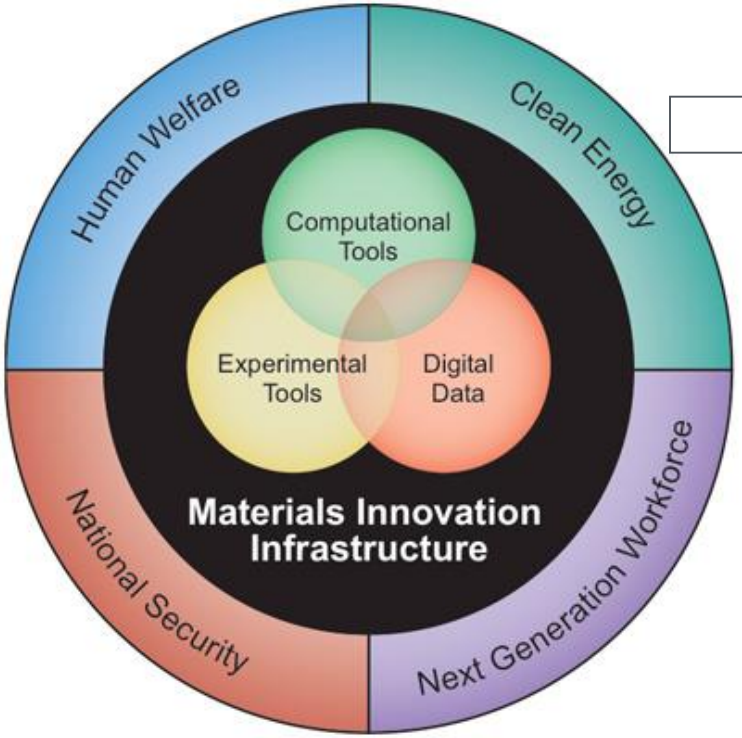
Energy Materials Network

U.S. Department of Energy

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

March 30th, 2016

In Support of the Materials Genome Initiative (MGI)



MGI - Framework

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Coordinated resource network with a suite of capabilities for advanced materials R&D

Predictive Simulation Across Scales	Synthesis & Characterization	Rapid Screening	End Use Performance
Process Scalability	Process Control	Real-time Characterization	Reliability Validation

Data Management & Informatics

Materials Design & Synthesis → **Functional Design** → **Process Scale-Up & Qualification**

New Material Innovations for Clean Energy 2X Faster and 2X Cheaper

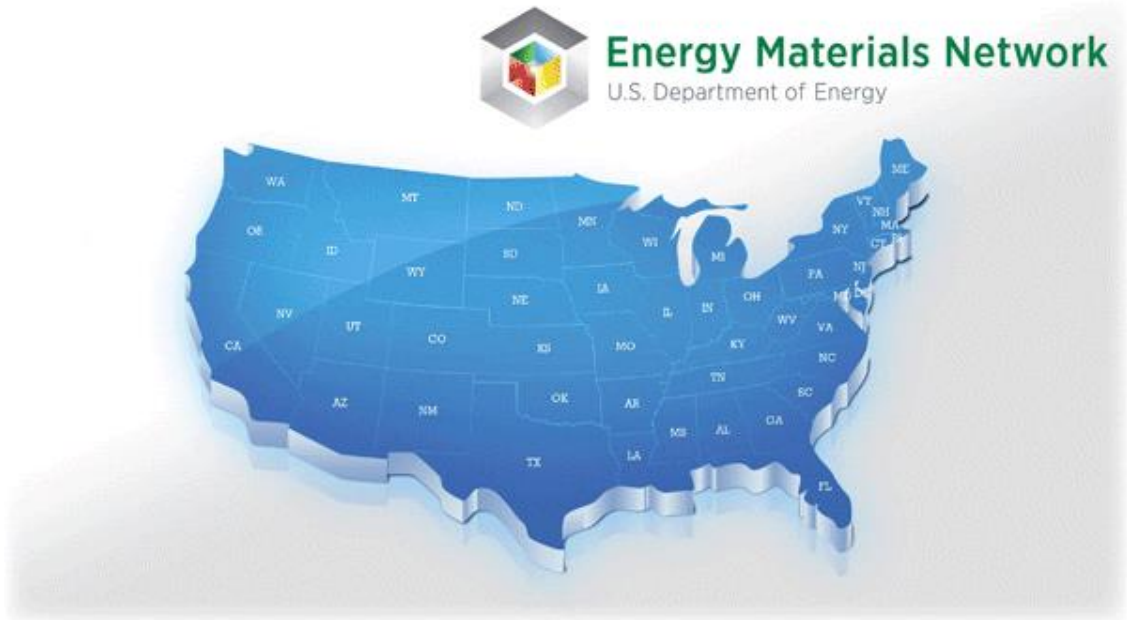
Network Requirements

1. ***WORLD CLASS MATERIALS CAPABILITY NETWORK:*** Create and manage a **unique, accessible set of capabilities** within the DOE National Laboratory system
2. ***CLEAR POINT OF ENGAGEMENT:*** Provide a **single point-of-contact** and concierge to direct interested users (e.g. industry research teams) to the appropriate laboratory capabilities, and to **facilitate efficient access**.
3. ***DATA AND TOOL COLLABORATION FRAMEWORK:*** **Capture data, tools, and expertise** developed at each node such that they can be **shared and leveraged** throughout the EMN and **in future programs**. Establish data repositories and, where appropriate, distribute data to the scientific community and public. Accelerate learning and development through data analysis using advanced informatics tools.
4. ***STREAMLINED ACCESS:*** Facilitate **rapid completion of agreements** for external partners, and aggressively pursue approaches to reduce non-technical burden on organizations seeking to leverage the EMN for accelerated materials development and deployment.

Key Guidance & Principles

1. ***NATIONAL LABORATORY LED CONSORTIA***
2. ***COMMON YET FLEXIBLE CONSORTIUM MODEL***
3. ***CONSISTENCY AND TRANSPARENCY ACROSS EFFORTS***
4. ***ENDURING CAPABILITIES WITHIN THE NETWORK***

Leveraging World-Class Capabilities Across National Labs



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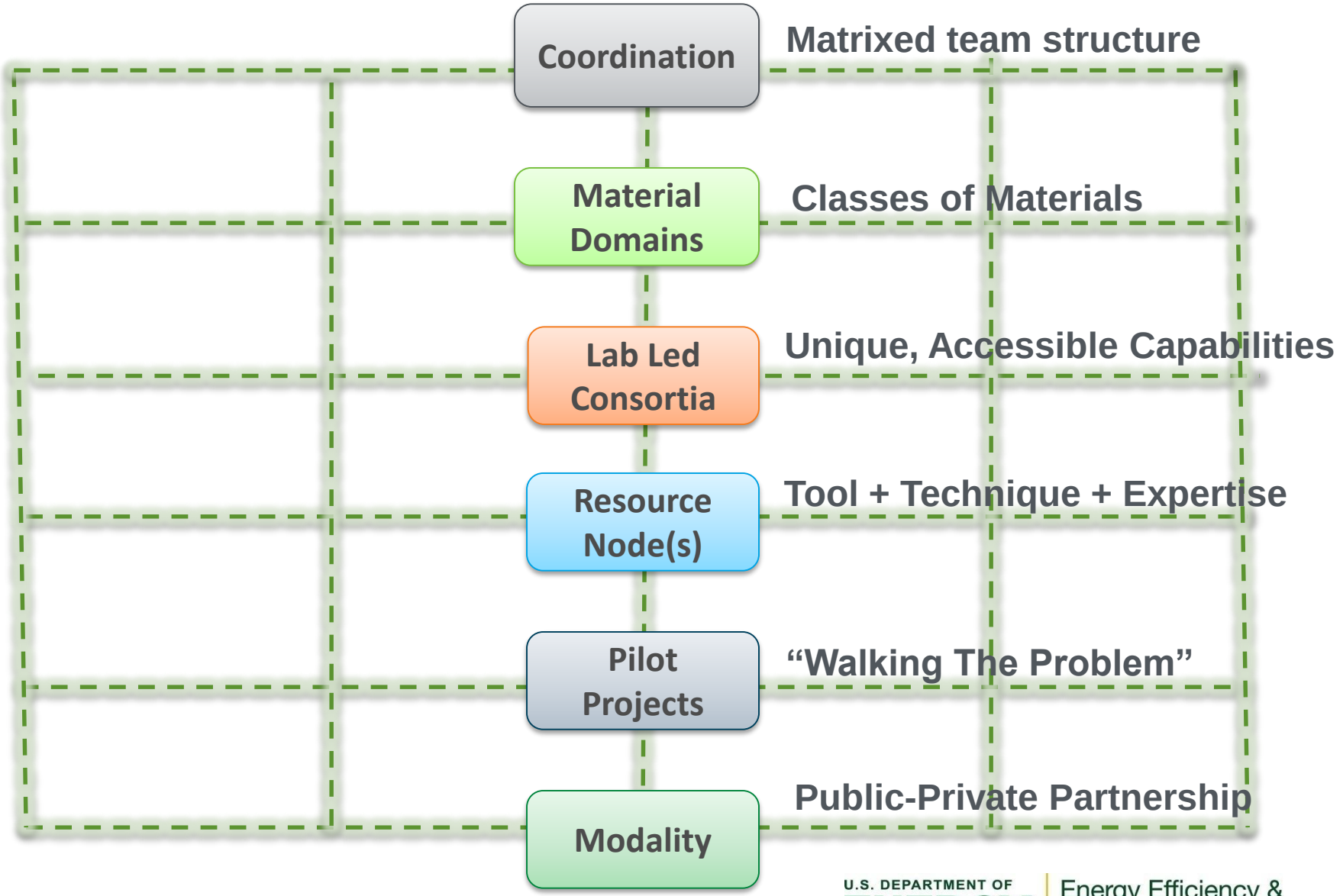
Framework for the Energy Materials Network



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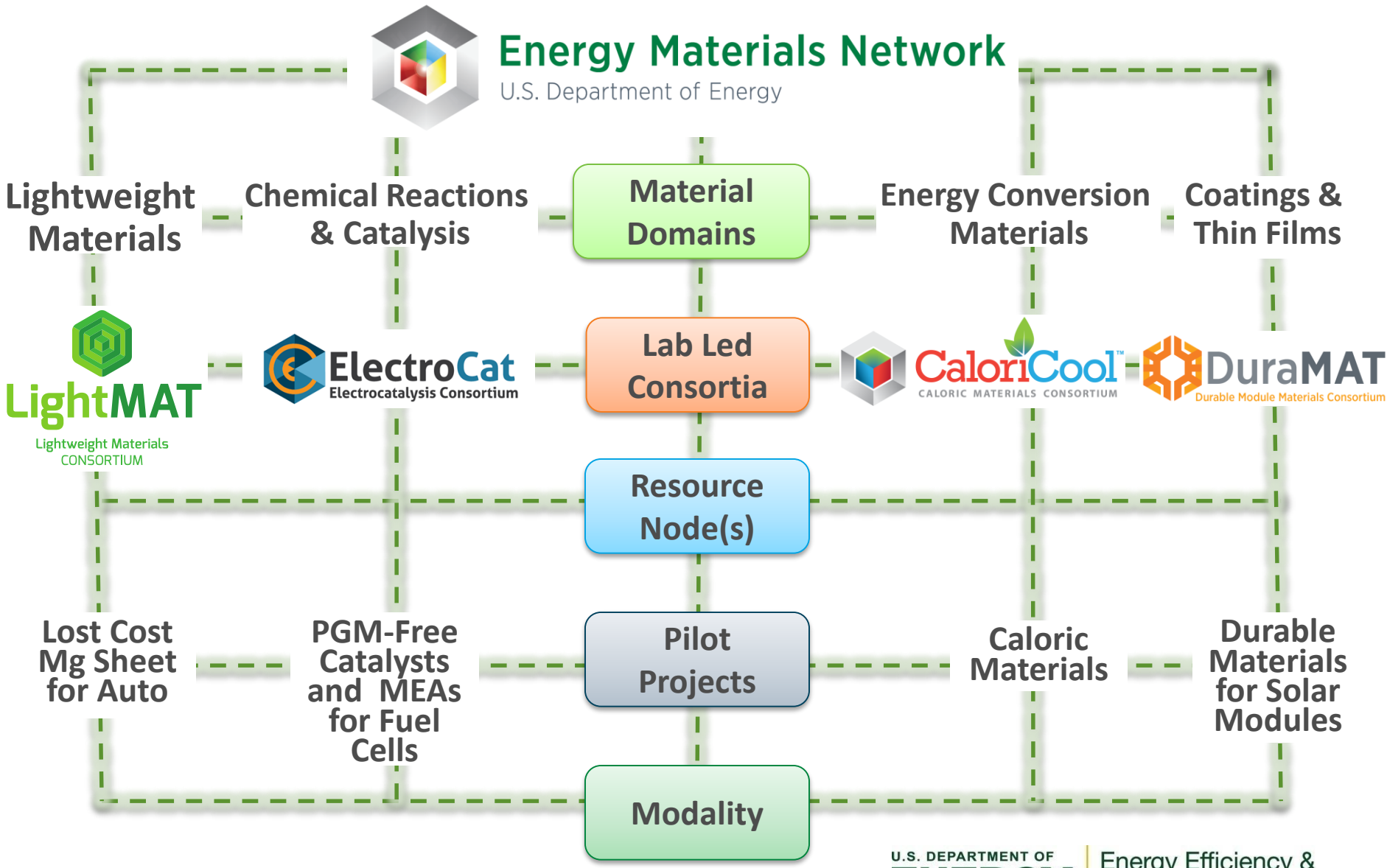
The Energy Materials Network



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The Energy Materials Network (Fiscal Year 2016)

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Lightweight Materials	Chemical Reactions & Catalysis	Energy Conversion Materials	Coatings & Thin Films
LightMAT Lightweight Materials CONSORTIUM	ElectroCat Electrocatalysis Consortium	CaloriCool™ CALORIC MATERIALS CONSORTIUM	DuraMAT Durable Module Materials Consortium
Lost Cost Mg Sheet for Auto	PGM-Free Catalysts and MEAs for Fuel Cells	Caloric Materials	Durable Materials for Solar Modules

EMN Planned Consortia

Consortia	FY16	FY17
LightMAT Lightweight Materials CONSORTIUM	Low Cost Mg Sheet for Auto	Low Cost Precursors for Carbon Fiber; Mg Corrosion
ElectroCat Electrocatalysis Consortium	PGM-Free Catalysts and MEAs for Fuel Cells	Continuation
CaloriCool™ CALORIC MATERIALS CONSORTIUM	Caloric Materials for Efficient Cooling	Continuation
DuraMAT Durable Module Materials Consortium	Durable, PV Form Factors	Continuation
ChemCatBio Chemical Catalysis for Bioenergy		Advanced Catalysts for Biofuels
HyMARC		Materials Based, Low Pressure H_2 Storage
Fuel Cell - Consortium #7		Advanced Water Splitting for Renewable H_2

About EMN

https://www.youtube.com/watch?feature=player_detailpage&v=FdNRViXAV3s

Building Momentum…

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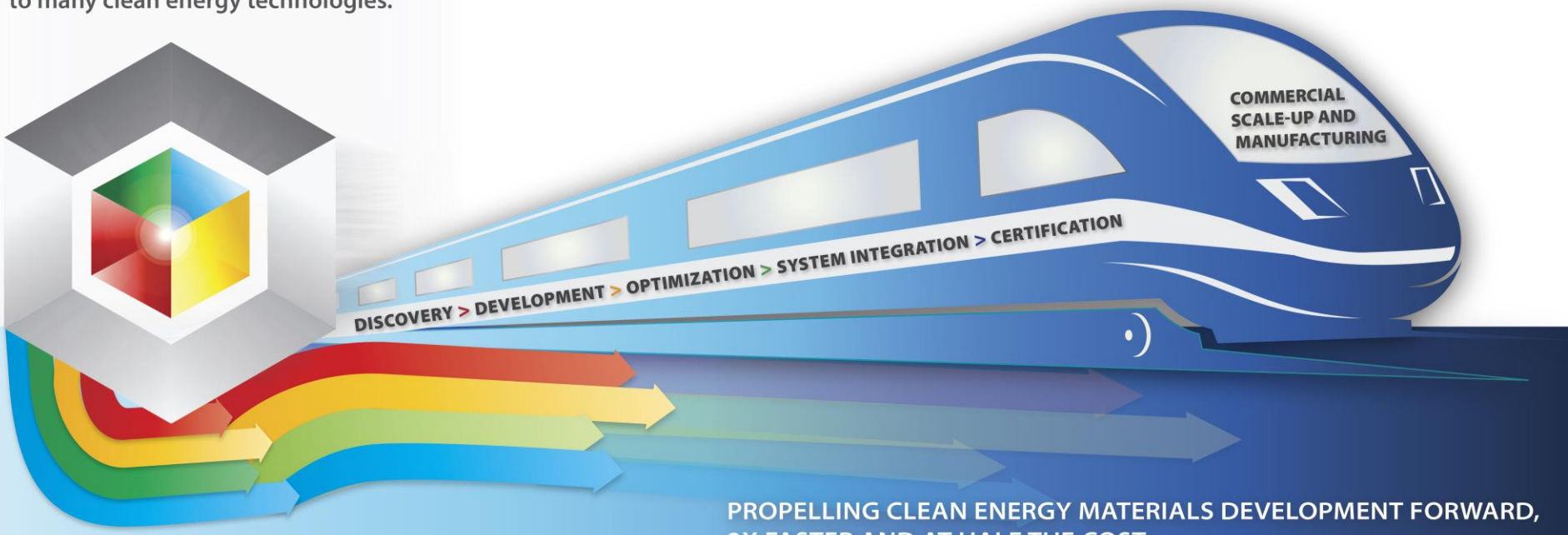
The Energy Materials Network (EMN) aims to dramatically decrease time-to-market for advanced materials that are critical to many clean energy technologies.

WORLD-CLASS INNOVATION
EMN is fueling U.S. industry with leading scientific and technical capabilities, data, and tools, and helping deliver innovative clean energy products to the world marketplace through its network of national lab-led consortia.

CLEAR POINTS OF ENGAGEMENT
In building an enduring, accessible network, EMN offers industry clear points of engagement and streamlined access to national lab resources by providing technical support, collaboration tools, and data platforms.

RAPID SCALE-UP
EMN is addressing market deployment barriers and getting new technologies to market faster by better integrating all phases of the materials development cycle, from discovery through deployment.



EMN's initial consortia are focusing on targeted materials tracks aligned with some of industry's most pressing clean energy materials challenges.

- LIGHTWEIGHT MATERIALS FOR VEHICLES
- DURABLE MATERIALS FOR SOLAR MODULES
- CALORIC MATERIALS FOR HEAT PUMP TECHNOLOGIES
- NEXT-GENERATION ELECTRO-CATALYSTS FOR FUEL CELLS

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