

U.S. Department of
ENERGY | Office of Manufacturing
& Energy Supply Chains

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The Office of Manufacturing and Energy Supply Chains

US DRIVE Overview
October 21, 2024

Securing the foundation of America's Energy Future

Keeping the lights on today. Training the workforce for tomorrow.



Analysis

MESC Conducts **Cutting-Edge Economic and Technical Analyses** to Identify the Gaps and Growth Opportunities Across the Nation's Energy Supply Chains.



Manufacturing

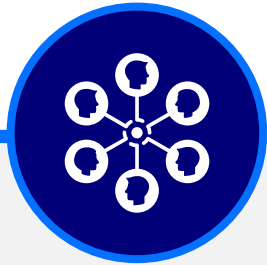
Making the U.S. Energy System More Secure
14 Manufacturing Facilities Built or Retrofitted,
with 16 More Facilities in the Project Pipeline



Workforce

8,495 Permanent and Construction **Jobs Created**
\$127M Total Direct Investments in Clean Energy Workforce to Date

MESC is all about de-risking energy supply chains



MESC's Vision

To **eliminate vulnerabilities in US clean energy supply chains**, while driving unparalleled social, economic, and environmental impact through our Programs & awards

MESC's Core Functions

Manufacturing Investing

Strengthening and securing the energy supply chains America needs for a secure, clean and equitable energy system

Workforce Investing

Supporting workforce skills development by directly funding cutting-edge energy manufacturing training programs

Manufacturing Analytics Backbone

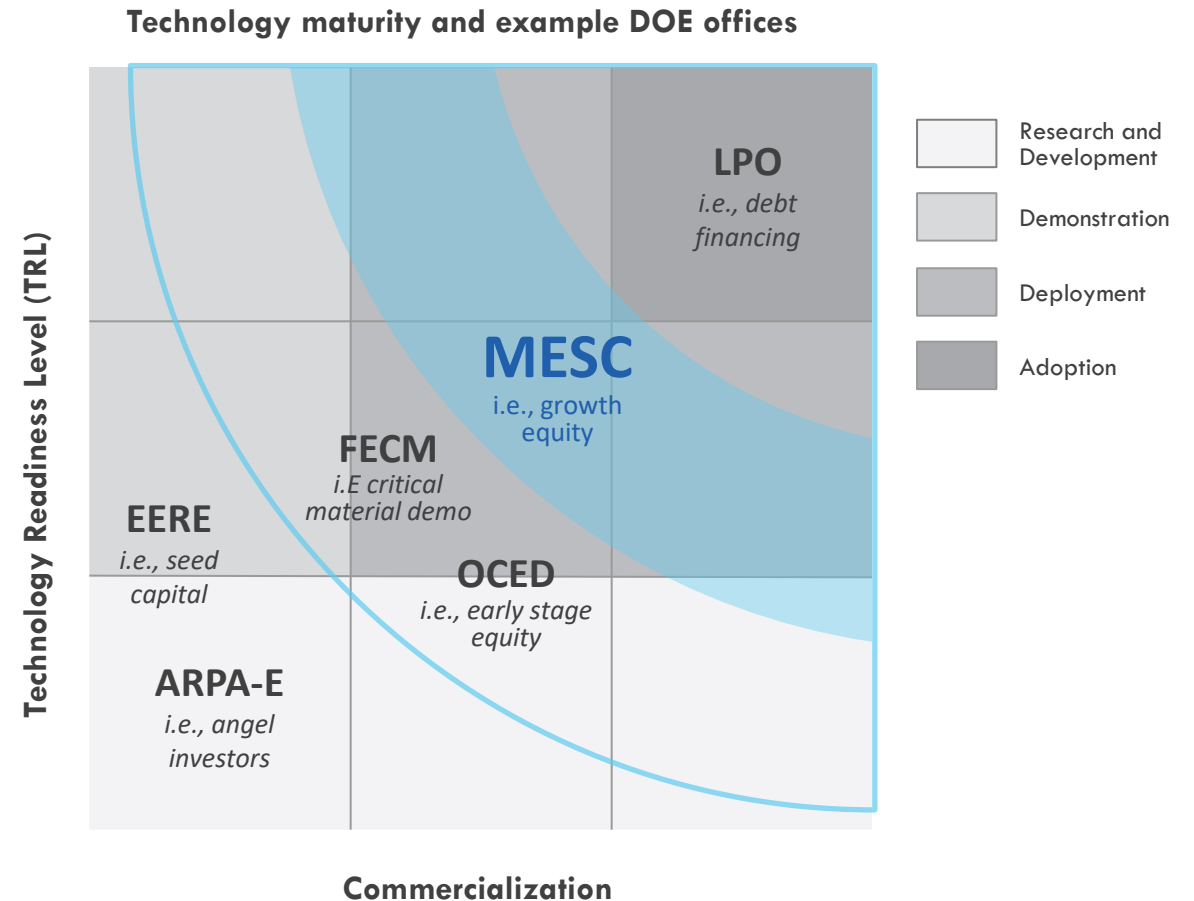
Robust modeling to guide and support DOE strategy and investments, private sector collaborative investments, and federal policy recommendations

MESC operates in late-stage technology development, driving large-scale deployment of new technologies

The Office of Manufacturing and Energy Supply Chains is working alongside private capital to be a force multiplier to secure American supply chains domestically.

All DOE and MESC investments follow a data-driven approach, building on modeling, mapping, and analysis foundational from MESC experts.

MESC is supporting workforce through direct funding of cutting-edge energy manufacturing programs at universities, community college, and trade-schools to provide entry-level and mid-career support.



2024 MESC Goals

Strengthen U.S Manufacturing Capacity and Workforce

30,528 TOTAL JOBS CREATED

\$20B MADE AVAILABLE

PERMANENT JOBS

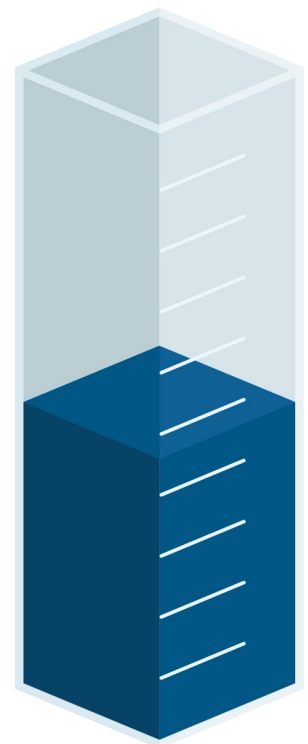
CONSTRUCTION JOBS

21,243
Achieved to date

15,000
Enabled



20,000
Enabled



9,285
Achieved to date

Create average of **150+ jobs** per project

Invest **\$1B** in **GREEN INDUSTRIAL FACILITIES**

\$600M **\$1B**

To date, we have invested \$600 million across the 40209 Advanced Manufacturing in Energy Communities program and through 48C tax credit allocations to go towards new-build green industrial product facilities.

Manufacturing is accelerating across clean energy technologies

US MANUFACTURING INVESTMENT ANNOUNCEMENTS

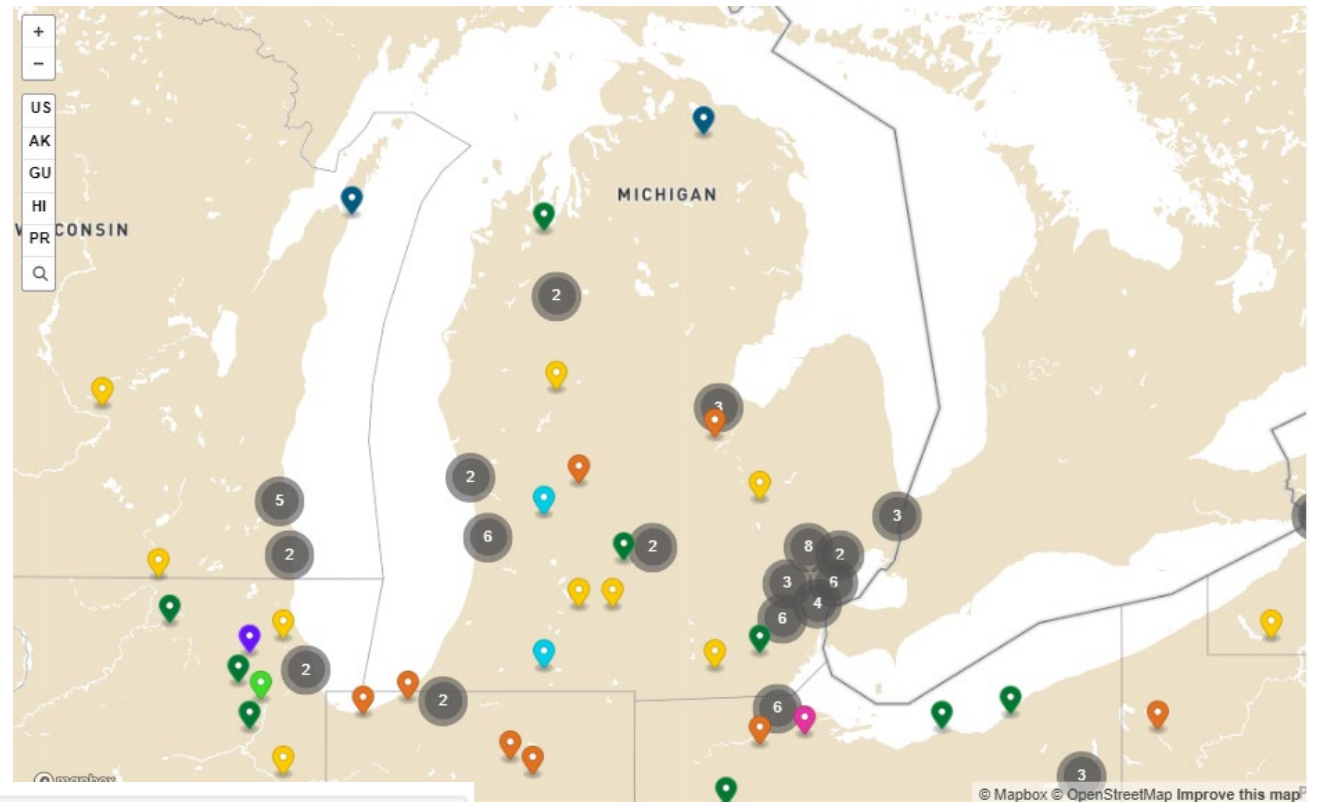
\$120 billion+ Batteries

\$35 billion+ EVs & EV Chargers

\$16 billion+ Solar

\$3.5 billion+ Offshore Wind

\$2 billion+ Electrolyzers & Fuel Cells



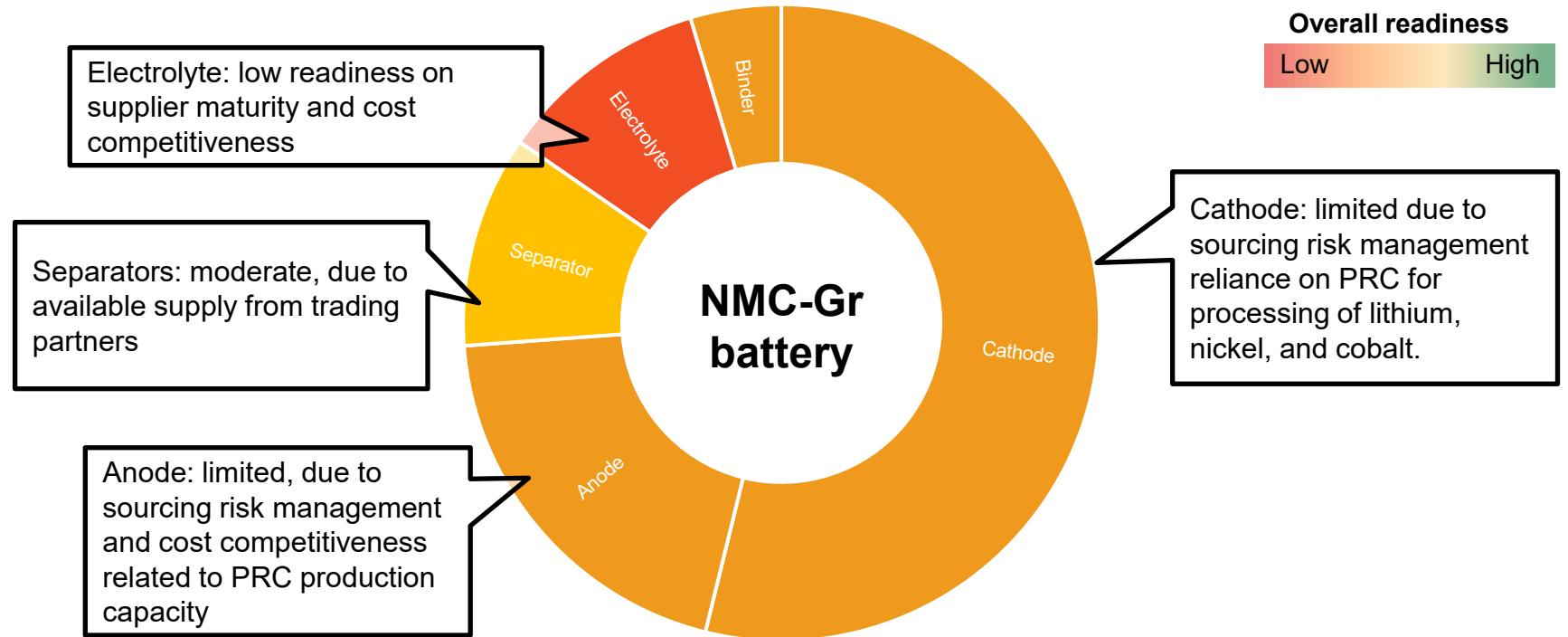
TECHNOLOGY

- Batteries
- Electric Vehicles
- Heat Pumps & Clean HVAC
- Hydrogen
- Nuclear
- Offshore Wind
- Solar

U.S. battery supply chain readiness scored as “moderate” as domestic production ramps up

Supply Chain Readiness Example: NMC-Gr, 2024: MODERATE

- Trading partner relationships add stability, with mature supplier inputs, end customers, and markets
- US production faces cost competitiveness challenges against global price benchmarks (~20% price delta) across upstream materials and manufacturing



Upstream Materials



Limited due to nascent processing and refining capacity for battery-grade metals and materials

Manufacturing







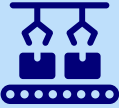






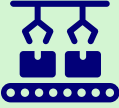

Moderate due to available supply and customers in domestic and trading partner markets

Workforce



Low due to labor supply and demand gap and hiring difficulty compared to other manufacturing sectors

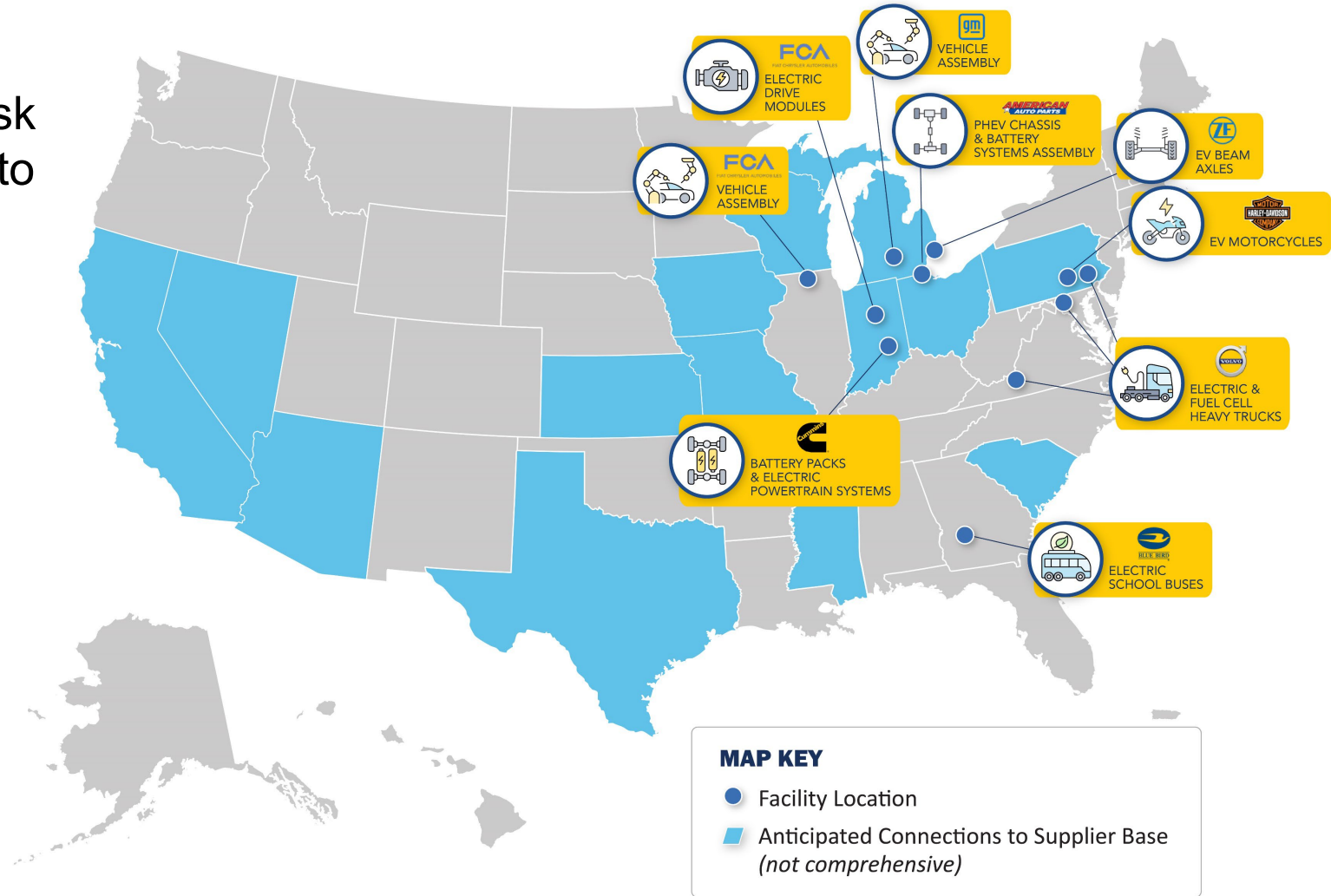
Current MESOC Programming

OPEN FOR APPLICATIONS		UNDER REVIEW		SELECTED FOR NEGOTIATION	
	Industrial Assessment Centers Implementation Grants (\$400 million)		Advanced Manufacturing and Recycling Grants R2 (\$425 million)*		Advanced Manufacturing and Recycling Grants R1 (\$275 million)
	Extended Product System Rebates (\$10 million)		Smart Manufacturing & Recycling Tactics for States (SMART) Grant Program (\$63 million)		Consumer Electronics Battery Recycling, Reprocessing, and Battery Collection for States & Local Government (\$7.2 million) & Retailers (\$15 million)
			Domestic Manufacturing Conversion Grants Program State Set Aside (\$50 million)		Defense Production Act – Heat Pumps Manufacturing R1 (\$169 million) & R2 (\$63 million)*
			48C Tax Credits R2 (\$6 billion)*		Domestic Manufacturing Conversion Grants Program (\$2 billion)*
					IAC Clean Energy Manufacturing Workforce Training and Technical Assistance Awards R1(\$32 million) & R2 (\$24 million)
					State Manufacturing Leadership Program (\$22 million)
					Battery Material Processing and Battery Manufacturing Grants (\$3.5 billion)

* prior submission of a concept paper required for to submit a full application

IRA 50143: Domestic Conversion Grants Program – Direct Investments

- **\$1.7 billion** in grant funding to convert 11 at-risk or shuttered ICE facilities to EV production
- 50% cost share with grantees
- **\$4.9 billion** in total economic value
- Over **3,700 jobs** created
- **15,000 jobs** retained
- Production anticipated to start Q2 2026 with full conversions by Q4 2028



IRA 50143: Domestic Conversion Grants Program – State Partnerships

Program Overview

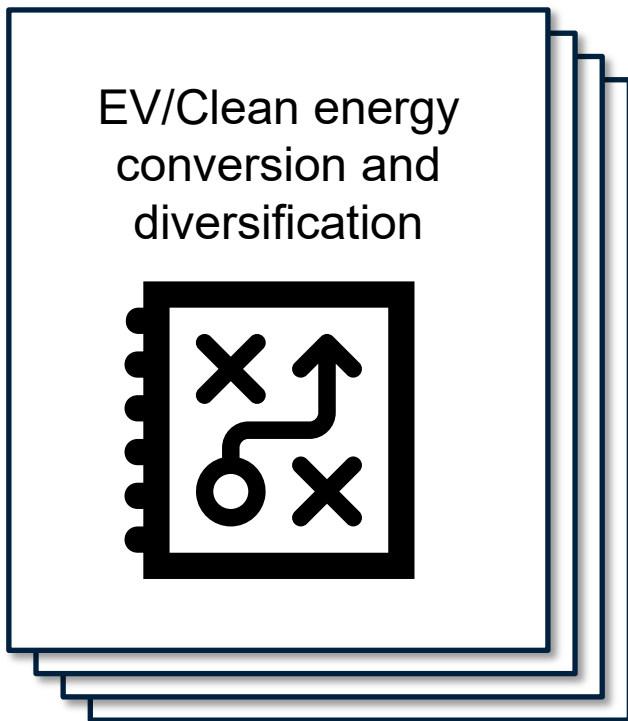
- \$50 million set-aside from \$2 billion in IRA 50143 funding to target manufacturers lower in the automotive supply chain
- Formula grant funding from MESC to six states with significant automotive manufacturing workforces: Michigan, Ohio, Indiana, Tennessee, Kentucky, and Illinois
- State determines the entity that will manage the program and grants
- Currently reviewing applications for award in late 2024/early 2025

Program Requirements

- Projects must convert an existing facility from ICE to EV supply chain
- 50% cost share minimum – state to determine source of matching funds
- State to define eligible small and medium manufacturers
- Funds to cover capital or operating expenditures

BIL 40521: Industrial Training and Assessment Centers – Small Supplier EV Transition Playbook

Expected public release: Late 2024 / early 2025



MESC and Argonne National Laboratory developed a small supplier EV transition playbook. The playbook covers several topics:

- Which internal combustion vehicle products face greater tailwinds and headwinds in the clean energy transition
- Possible EV/clean energy market opportunities, and how to identify others
- Approaches to prioritizing and pursuing new market opportunities
- Operational considerations, including financing, workforce, new certifications/standards requirements, etc.

\$1.5 million in funding awarded to interdisciplinary ITAC teams to deploy and refine playbook:



Purdue University Manufacturing Extension Partnership + Conexus Indiana



University of Michigan and Michigan State ITAC



UIC-Chicago ITAC, Argonne National Lab, Illinois Manufacturers Association, Midwest Energy Efficiency Alliance

Qualifying Advanced Energy Credit (48C) Overview

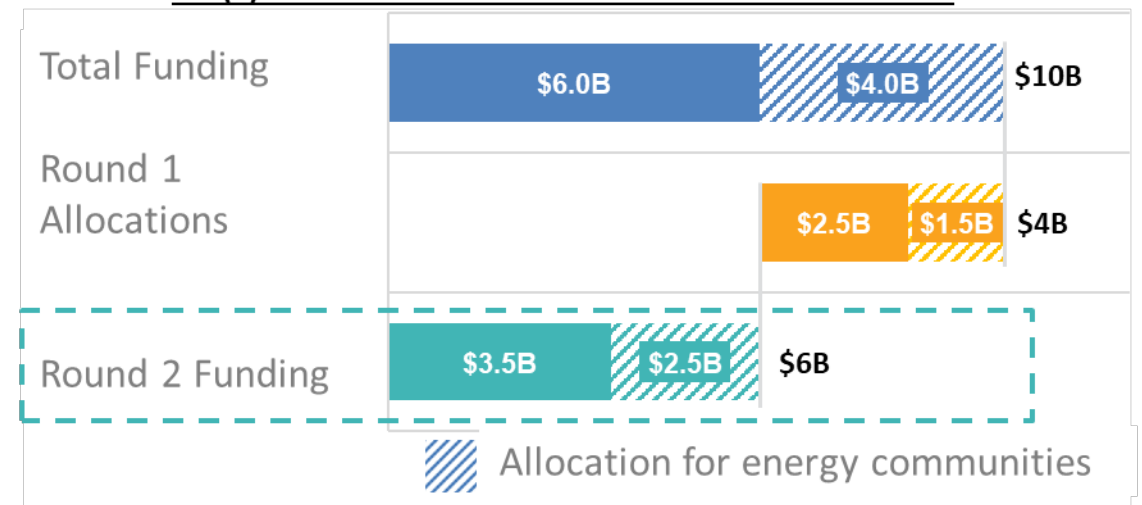
48C(e) Expanded with \$10B in Funding

- Competitively-awarded **Investment Tax Credit (ITC)** first established by the 2009 Recovery Act
- **Expanded by IRA in 2022 with \$10B** for
 1. Clean Energy Manufacturing/Recycling
 2. Critical Materials
 3. Industrial Decarbonization Projects
- DOE accepted a first round of applications in 2023, and IRS allocated \$4 billion of the program's \$10B total
- Round 2 Announced in April 2024 for up to \$6 billion
- Selected projects receive up to a **30% ITC** (6% if apprenticeship and prevailing wage requirements are not met)
- In certain circumstances, **applicable entities can elect for direct pay** in lieu of a tax credit
- At least **40% of all credits will be allocated to projects in 48C(e) energy communities**

Key Considerations for Round 2

- Open to **all project sizes**
- DOE will **not predetermine funding** allocated to each category
- Applicants who did not receive an allocation in Round 1 are **eligible to apply in Round 2**

48C(e) FUNDING ALLOCATION FOR ENERGY COMMUNITIES



BIL 40207: Consumer Electronics Battery Recycling, Reprocessing, and Battery Collection for State and Local Governments and Retailers

Appropriations of \$65 million to assist States and units of local government, and retailers with battery collection and recycling

Grants to establish or enhance battery collection, recycling, and reprocessing programs.

- Programs can focus on any or all recycling steps such as collecting, handling, sorting, storing, and transporting spent and discarded batteries and electronics containing batteries up to the physical recycling process.

Up to \$10M per grant, proposal must include a 50% cost share.

BIL 40207: Battery Material Processing and Manufacturing Grants – Round 1

Mineral Processing

TALON METALS CORP.
 Construct an advanced domestic battery minerals processing facility
 Beulah, ND
 Initial Operation: 2027

Precursor

Mexichem.
 First U.S. manufacturing plant for lithium hexafluorophosphate (LiPF6) electrolyte salt
 St. Gabriel, LA
 Initial Operation: 2026

SOLVAY
 A new battery-grade polyvinylidene fluoride (PVDF) facility
 Augusta, GA
 Initial Operation: 2026

Anode

ANOVION TECHNOLOGIES
 First U.S.-owned and operated large-scale production of synthetic graphite anode material
 Bainbridge, GA
 Initial Operation: 2026

GROUP14
 Commercial manufacturing of next-generation silicon-carbon composite anode material
 Moses Lake, WA
 Initial Operation: 2024

Sila
 Construct a commercial-scale silicon anode production facility
 Moses Lake, WA
 Initial Operation: 2026

NOVONIX
 Mass production of lower carbon intensity synthetic graphite anode materials
 Chattanooga, TN
 Initial Operation: 2024

Cathode

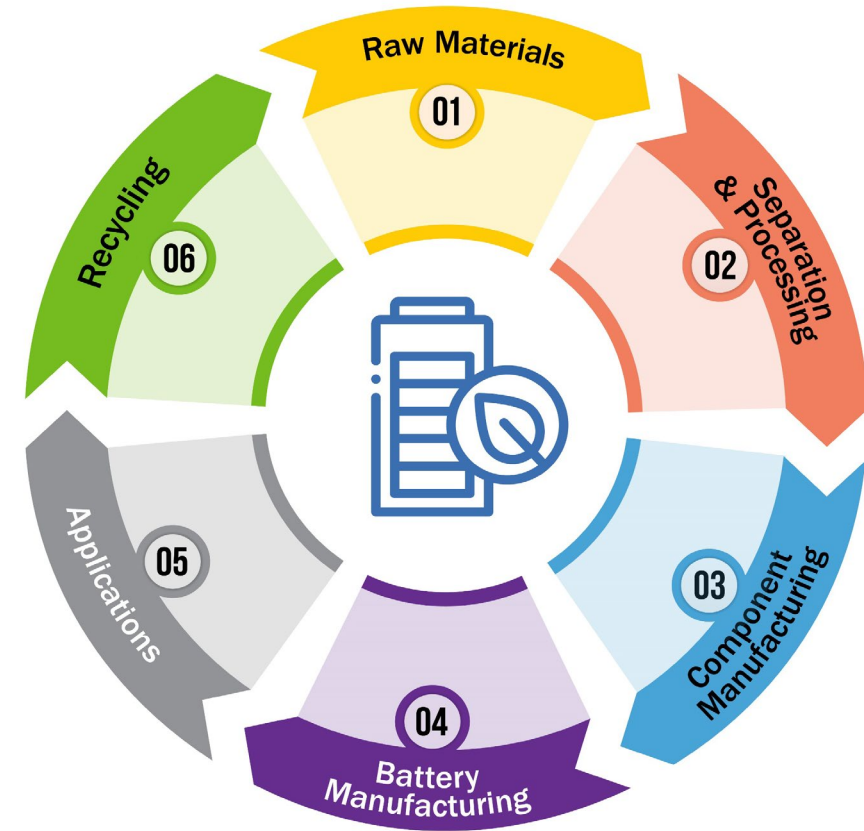
Albemarle
 New lithium processing plant that uses domestic sustainably extracted spodumene
 Kings Mountain, NC
 Initial Operation: 2028

ICL
 Commercial production of Lithium Iron Phosphate cathode powder
 St. Louis, MO
 Initial Operation: 2026

Demonstration to produce multiple battery chemistries more cost effectively and sustainably
6K
 Jackson, TN
 Initial Operation: 2025

Two awards, First commercial-scale, integrated metal extraction and pCAM facility in the USA
ASCEND ELEMENTS
 Hopkinsville, KY
 Initial Operation: 2025

Demonstration of battery-grade lithium hydroxide from unconventional sedimentary resources
ABTC AMERICAN BATTERY TECHNOLOGY COMPANY
 Tenopah, NV
 Initial Operation: 2026



Recycling



Cirba Solutions
 Expansion and upgrade of Li-ion recycling facility
 Lancaster, OH
 Initial Operation: 2024

BIL 40207: Battery Material Processing and Manufacturing Grants – Round 2

Raw Materials and Precursors







 <p>Commercial domestic production of lithium carbonate using direct lithium extraction Location: Lewisville, AR Initial Operation: 2029</p>	 <p>Integrate nickel mining with next-generation critical mineral processing to turn waste streams into valuable critical materials Location: Champion, MI & Gwinn, MI Initial Operation: 2028</p>
 <p>Commercial-scale facility for direct lithium extraction from domestic brine resources Location: Texarkana region Initial Operation: 2029</p>	 <p>Commission and operation of a domestic silane manufacturing plant to directly feed silicon-based anode production Location: Moses Lake, WA Initial Operation: 2027</p>

Separation and Processing





 <p>Building and operating an environmentally sustainable refining facility to produce high purity manganese sulphate monohydrate Location: Baton Rouge, LA Initial Operation: 2028</p>	 <p>Construction of manganese processing facility for domestic production of high purity manganese sulfate monohydrate Location: Patagonia, AZ Initial Operation: 2029</p>
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Anode and Cathode

 <p>Retrofitting of a domestic manufacturing facility to produce commercial quantities of Li metal anode material for next-generation lithium-ion batteries Location: Charlotte, NC Initial Operation: 2027</p>	 <p>Building and operating facilities that produce carbon nanotubes and conductive additives at commercial scale Location: Wayne County, MI Initial Operation: 2026</p>
<p>Low carbon-footprint next-generation synthetic graphite Location: Orangeburg, SC Initial Operation: 2028</p> 	 <p>Building and operation of domestic commercial production plant for LFP cathode materials and next generation battery materials such as LMFP Location: Muskegon, MI Initial Operation: 2026</p>
 <p>Establish an advanced silicon anode manufacturing facility Location: Flint, MI Initial Operation: 2027</p>	 <p>Commercial-scale facility for cost-effective, sustainable, and efficient production of coated spherical purified graphite Location: Muscle Shoals, AL Initial Operation: 2028</p>


Electrolyte and Separator

 <p>Domestic manufacturing using waste CO₂ to produce high-value battery grade carbonate solvents Location: U.S. Gulf Coast Initial Operation: 2030</p>	 <p>Commercial-scale facility for domestic production of LiFSI, a next-gen electrolyte salt Location: Geismar, LA Initial Operation: 2029</p>
 <p>Continuous production of sulfide-based solid electrolyte materials Location: Thornton, CO Initial Operation: 2028</p>	 <p>Retrofitting and expanding existing ultra-high molecular weight polyethylene production unit to enhance domestically produced separator quality Location: LaPorte, TX Initial Operation: 2028</p>

Recycling

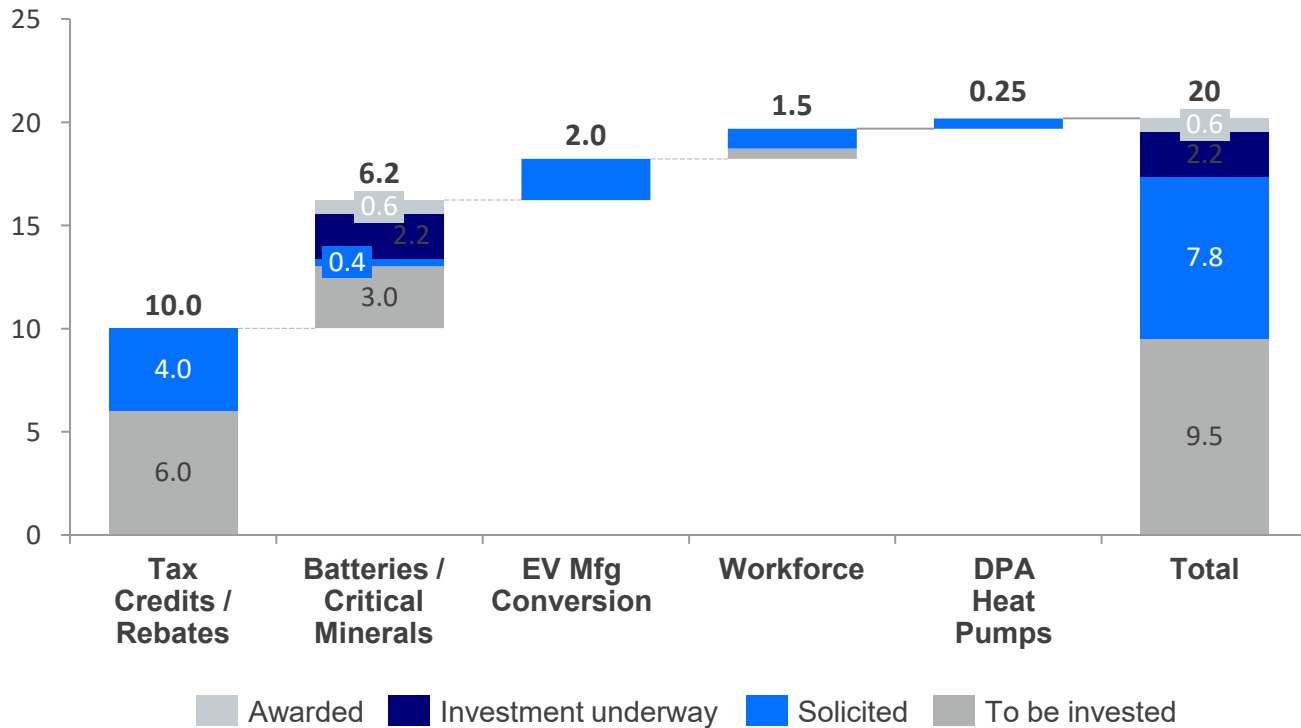
 <p>Construction of a new commercial-scale Li-ion battery recycling facility using materials from battery manufacturers and automotive OEM partners Location: South Carolina Initial Operation: 2027</p>	 <p>Construction of recycling facilities that convert graphite waste into high purity battery grade graphite with a low carbon footprint Location: Hopkinsville, KY Initial Operation: 2029</p>
 <p>Building and operating advanced Li-ion battery recycling facilities that produce a dry mixed metal precursor at high purity Location: Bartlesville, OK Initial Operation: 2026</p>	 <p>Building and operating a facility to process end-of-life Li-ion batteries and scrap from manufacturers to recover critical materials Location: Columbia, SC Initial Operation: 2027</p>
 <p>Recycling Li-ion battery production scrap into cathode active materials through a true closed-loop supply chain Location: Florence, SC Initial Operation: 2028</p>	 <p>Retooling a former manufacturing facility to establish a large-scale LFP cathode active material direct recycling and production plant Location: Kettering, OH Initial Operation: 2025</p>

Battery Manufacturing

 <p>Battery cell manufacturing facility producing high performance, cost competitive prismatic and cylindrical cells Location: Piedmont, SC Initial Operation: 2028</p>	 <p>New facility to produce high energy cylindrical Li-ion cells, with embedded commercial capabilities for ALD Location: Morrisville, NC Initial Operation: 2026</p>
 <p>Installing and running a commercial-scale iron-air battery manufacturing line Location: Weirton, WV Initial Operation: 2027</p>	

MESC is working to deploy an additional \$20B+ across workforce, batteries, and ESIB initiatives

MESC INVESTMENTS (\$B)



\$20B+

Amount outstanding to be invested

\$2.8B

Invested in batteries and critical minerals, to-date

~15%

Funding awarded or with investment underway

MESC's Impacts To-Date



\$3.9B+ private sector investment catalyzed



9,205 construction and permanent jobs created



**38% of investments in energy communities or
J40 communities**



1000+ students trained annually



1.3M+ EVs enabled annually



**\$54.5M+ in benefits flowing to communities
through Community Benefits Plans**

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