



U.S. DEPARTMENT OF  
**ENERGY**

# DOE's Critical Minerals and Materials Portfolio

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April 18, 2024



# Background

- **February 2020:** DOE and DoD brought together ~30 people from federal agencies that fund research in batteries. Group was interested in re-convening and formalizing.
- **September 2020:** Charter was signed among 4 agencies to formalize the group. Leadership team from the agencies convened monthly to set and execute the strategy for the group.
- **November 2020:** Developed quarterly cadence for meetings among interested agencies for information exchange. Membership increases.
- **February 2021:** E.O. 14017 required report on critical minerals and batteries to be sent to the White House in 100 days. Communication channels established through FCAB supported lead author agencies.

# Background

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- Today, FCAB is made up of 19 federal agencies with over 80 different offices involved
- FCAB general members meet quarterly
- FCAB's leadership group includes members from charter agencies, chair, and task group leads and meets monthly
- FCAB's executive steer group, which includes leadership from all charter agencies, meets twice a year

# Task Group Work

Task Groups are formed to advance specific initiatives. Task group structure may shift and change over time reflecting the evolving needs and focus areas.

Task Group Active in 2024	Focus Area
Domestic and Global Markets	Provide as-needed analysis and data related to global and domestic markets.
Minerals, Refining & Materials	Support access to raw and refined materials. Support the growth of a U.S. materials-processing. Encourage alternatives for critical minerals.
Cell & Pack	Stimulate the U.S. electrode, cell, and pack manufacturing sectors.
Reuse & Recycling	Drive domestic end-of-life reuse and critical materials recycling in a competitive value chain.
Innovation, IP, & Tech Transfer	Maintain and advance U.S. battery technology leadership through support of R&D, STEM education, and government collaboration
Workforce	Develop the workforce for domestic battery manufacturing industry
Battery Investments and Tracking	Track government supply chain investments to understand any gaps that need to be addressed by government or private industry



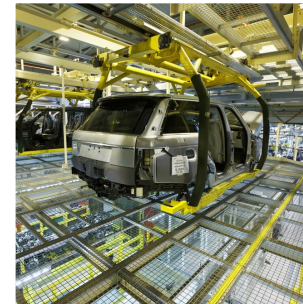
# Communication Channels

Government agencies



ABMI, CMI, DPA  
Task Groups  
Networking

Li-Bridge Alliance  
Featured  
Presentations



Industry Stakeholders

Research community



National Laboratories  
Academics

# Collaborative Efforts

## 2021

- [Battery Test Protocol](#)
- [Battery Policy and Incentive Database](#)
- [National Blueprint for Lithium Batteries](#)
- [EO 14017 America's Supply Chains "100 Day Review"](#)
  - Large Capacity Batteries
  - Critical Minerals & Materials
- [End-of-Year Report](#)

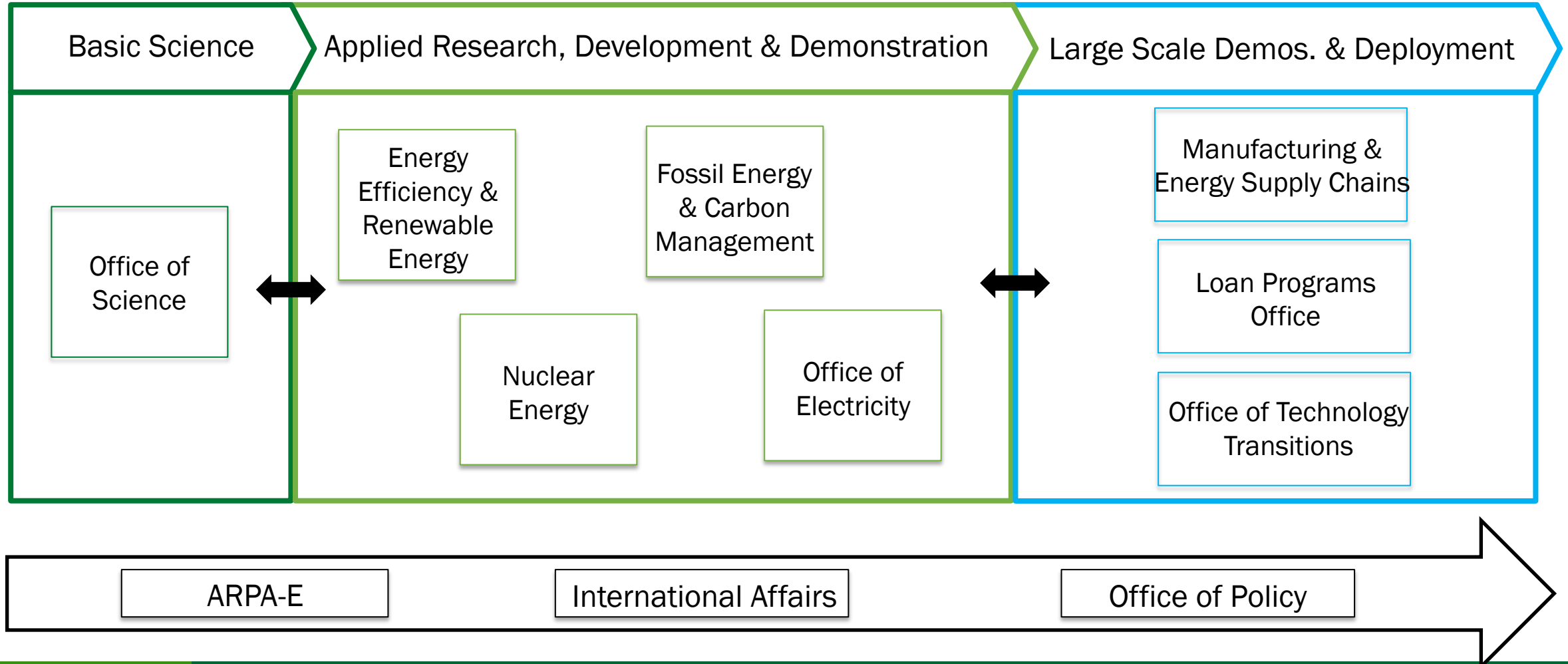
## 2022

- [EO 14017 America's Supply Chains "1-yr Reports"](#)
  - [America's Strategy to Secure the Supply Chain for a Robust Clean Energy Transition](#)
  - [Securing Defense-Critical Supply Chains](#)



# Critical Materials / Battery RDD&D Program

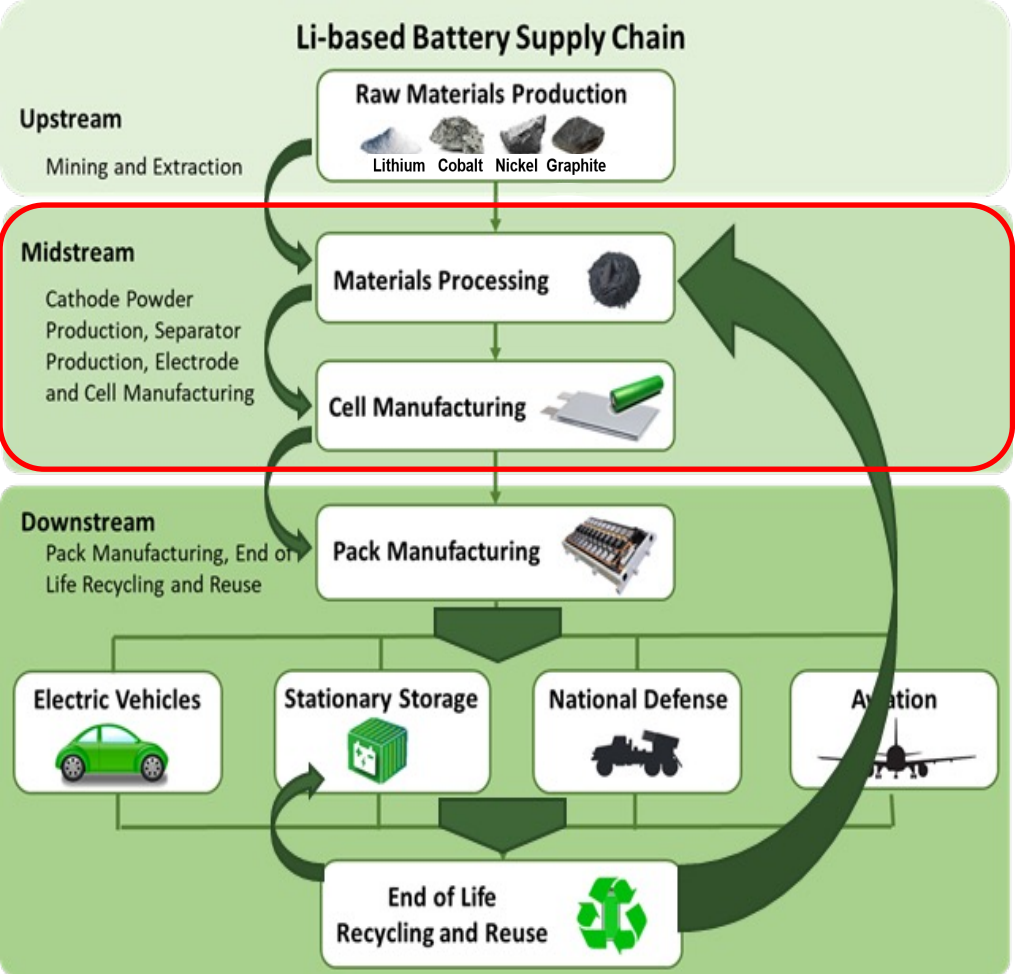
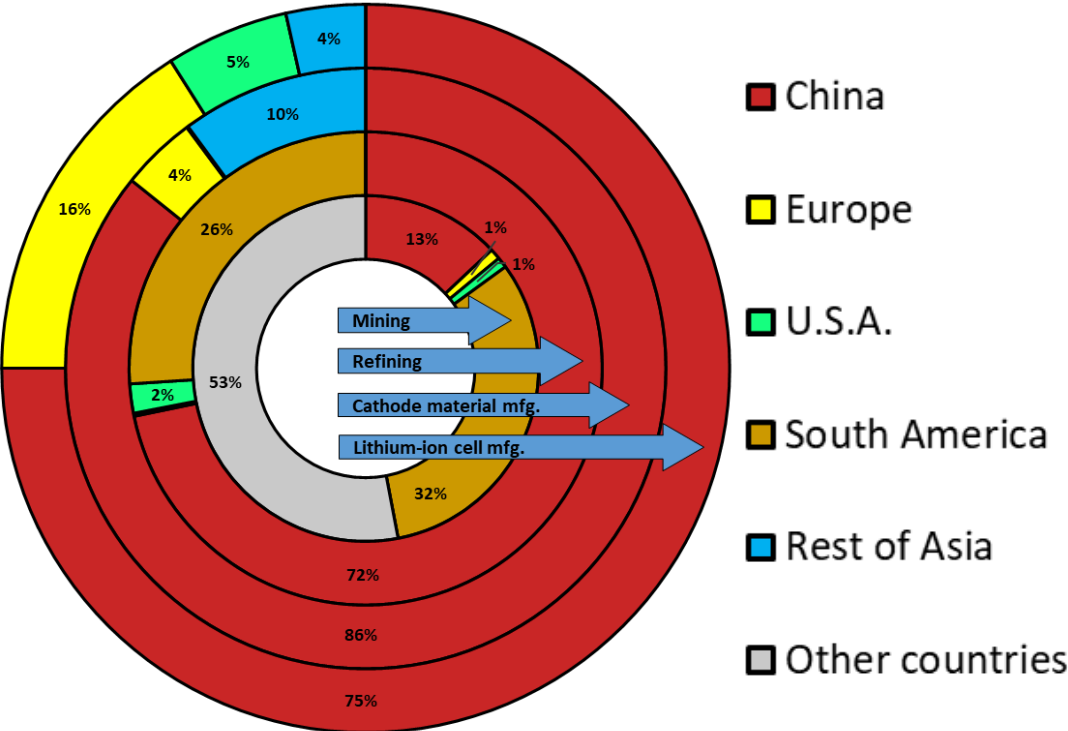
- The Program coordinates efforts funded by annual appropriations, BIL, and IRA – spanning basic science to deployment – and aligned with DOE’s CMM pillars



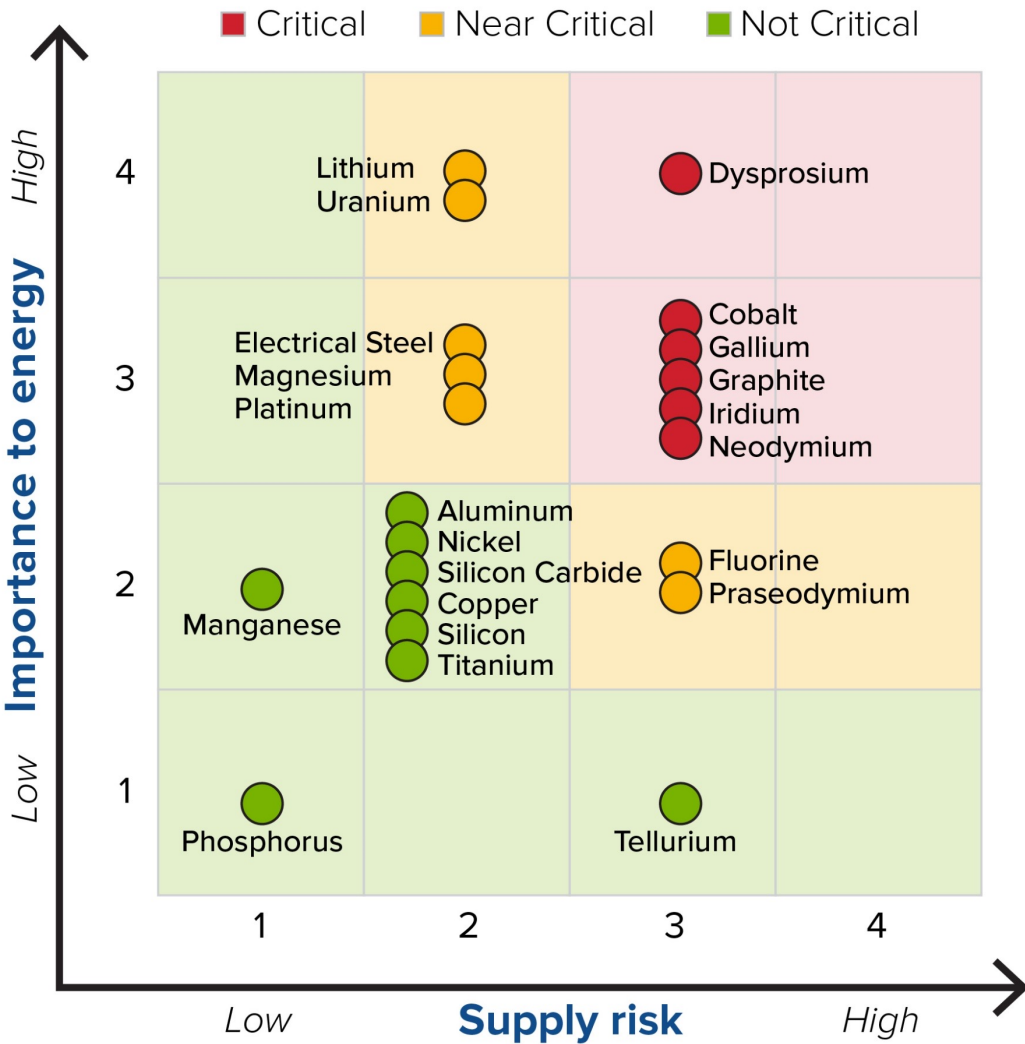
# Supply Chain Vulnerabilities: Lithium-Ion Batteries

- Up-to-mid stream capabilities are **geographically concentrated**
- **Lack of midstream capabilities are a gap** that limit growth of upstream supply and downstream value-add manufacturing

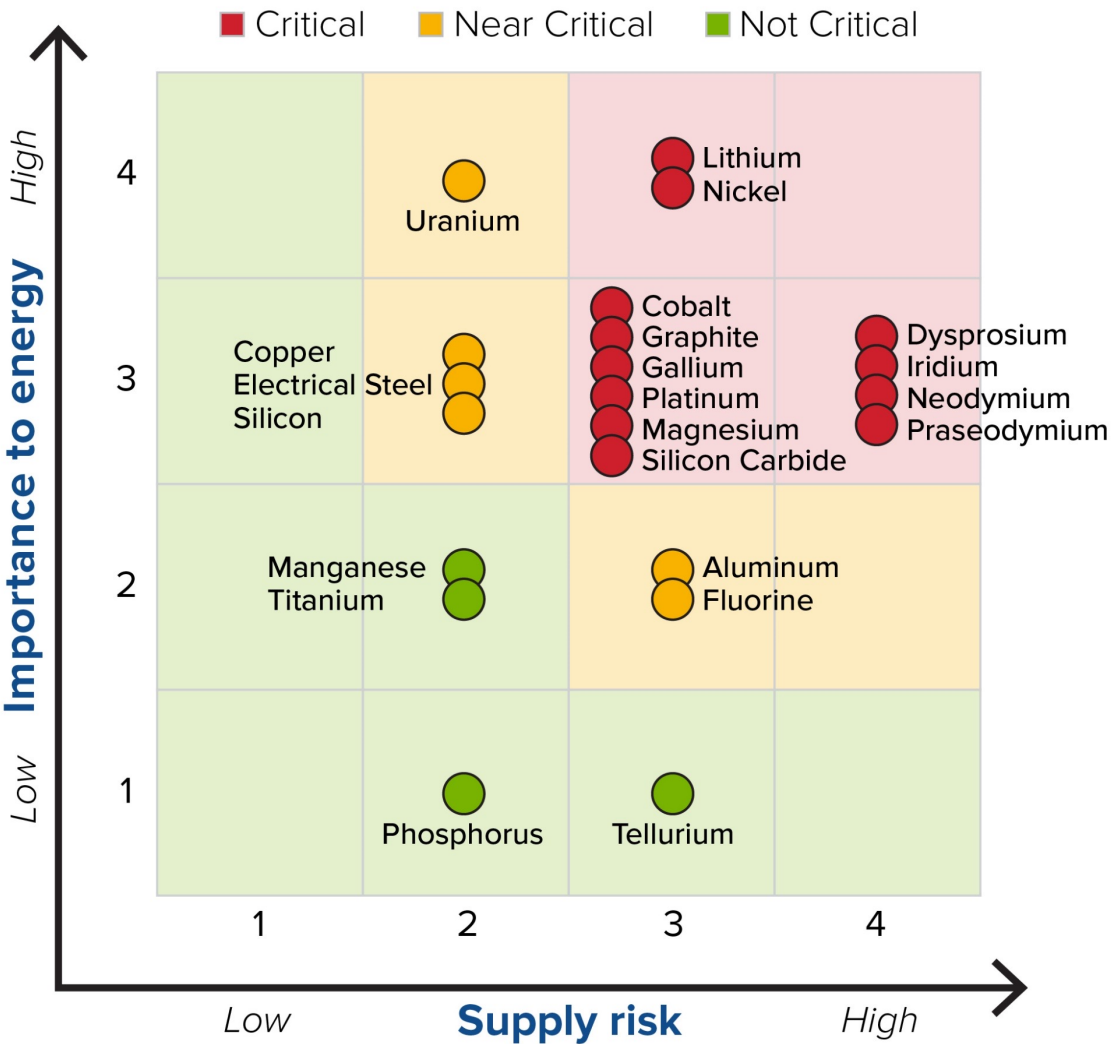
Geographic concentration of supply chain stages for lithium in lithium-ion batteries



# Criticality Results



SHORT TERM (2020 - 2025)

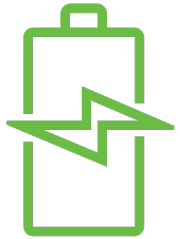


MEDIUM TERM (2025 - 2035)



# Unprecedented Federal Investment in Critical Materials

- **\$363 million in FY2023** appropriated for critical minerals and materials
- **Bipartisan Infrastructure Law (BIL) provided over \$8 billion** in funding dedicated to critical minerals and materials advancement, such as:



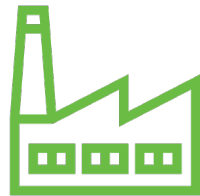
**Battery Materials,  
Manufacturing  
and Recycling  
Demos and  
Commercialization**  
\$6 billion



**Rare Earth Elements  
Demonstration  
Facility**  
\$140 million



**Critical Materials  
RDD&CA Program**  
\$600 million



**Critical Material  
Supply Chain  
Research Facility**  
\$75 million



**Clean Hydrogen  
Electrolysis  
Program**  
\$1 billion

- 30D Clean Vehicle Credit has critical mineral sourcing requirement
- 45X Advanced Manufacturing Production Credit has 10% production credit for critical mineral and electrode active material production
- 48C Advanced Energy Project Credit has investment tax credit for critical mineral production
- Loan authority
  - \$3.6B credit subsidy for Title 17
  - \$3B credit subsidy for Advanced Technology Vehicles Manufacturing (ATVM) loan program
  - BIL : Added "supply of critical minerals/materials" to the list of eligible technologies

# Unprecedented Federal Investment in Critical Materials

Recent funding opportunities, selections, and awards include:



\$2.8 billion for **battery materials processing** and **battery manufacturing recycling**

\$74 million to advance domestic **battery recycling and reuse**

\$107 million to **expand critical materials production capacity** for lithium-ion batteries



\$350 million for **long-duration energy storage demonstration**

\$30 million lab call for **long-duration energy storage**



\$16 million for front-end engineering design studies for the **REE demonstration facility**

\$11 million for **lithium extraction and conversion from geothermal brines**



\$39 million for the Mining Innovations for Negative Emissions Resource Recovery **MINER program**



\$17.5 million to **commercialize critical material-free permanent magnets** through the SCALEUP program

# Domestic Advancements in the last 10 years

- Prior to BIL/IRA, DOE CMM efforts were generally focused on fundamental discovery and R&D for new and novel technologies.
  - We needed to ***build the foundation*** of next-generation technology that is environmentally and technically sustainable in the US
- Post-BIL/IRA, DOE has established offices and long-term funding for commercialization and deployment of large-scale processing projects.
  - BIL is maturing technologies developed through prior R&D investments
- DOE-funded commercial battery materials projects via MESC and LPO to date ***can support 20-40% of EV battery mineral demand by 2030:***
  - 20-30% of cobalt, graphite, and nickel demand
  - 40+% of lithium demand
  - These projects include recycling, harvesting from alternate feedstocks, direct lithium extraction, and other highly innovative and sustainable methodologies
- Over **\$120 billion of private sector investments** announced so far in U.S. battery manufacturing and supply chain investments under President Biden

- Equipment sourcing
- Long Lead Times
- Capital availability
  - Mineral price volatility, high startup costs, long permitting timelines, and the current interest rate environment are keeping private capital on the sidelines
  - Companies are increasingly willing to navigate DOE grant / loan programs to advance mineral processing projects
- Price Volatility
- Geopolitical Stability and Resource Nationalism
  - Globally, export restrictions on critical raw materials increased 5 times over last decade
  - China increased number of restrictions on critical raw materials needed for EVs

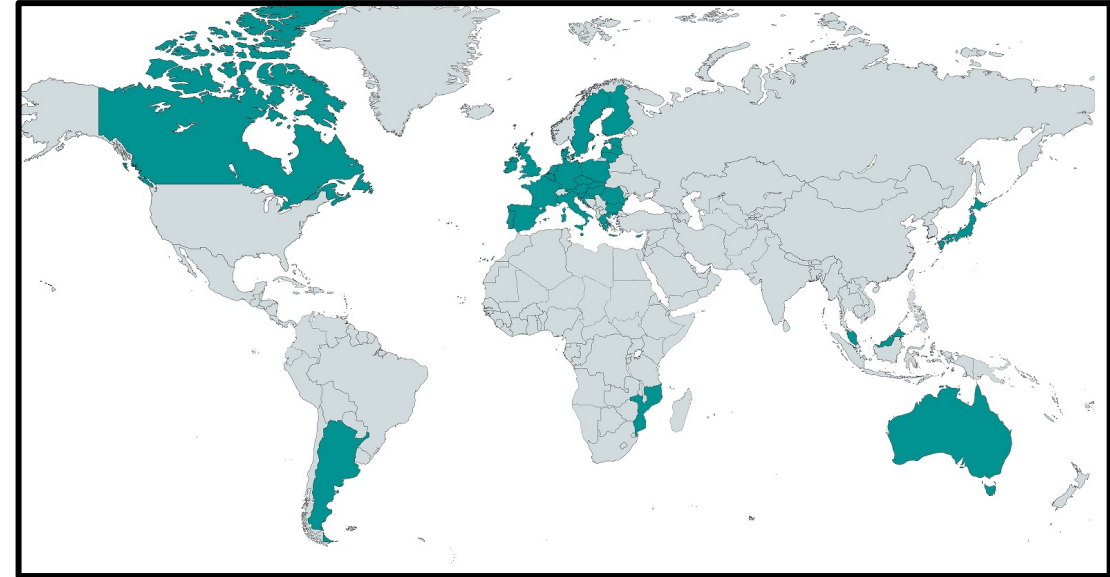


- **G20 Energy Transitions Working Group and Ministerial Meetings**
  - Mobilize political commitment to *diversified* and *responsible* supply chains for critical minerals and materials
- **G7 Experts Group on Critical Minerals**
  1. Forecast Long-Term Supply & Demand
  2. Responsibly Develop Resources & Supply Chains
  3. Increase Minerals Recycling & Share Capabilities
  4. Save with Innovations
  5. Prepare for Supply Disruptions
- **International Energy Agency (IEA) Critical Minerals Working Party**
  - Enhance security of supply
  - Create market transparency
  - Develop sustainable and responsible supplies
- **International Organization for Standardization (ISO) Standards**
  - DOE monitors critical mineral and material related standards for manufacturing and production
- **Conference on Critical Materials and Minerals (CCMM)**
  - Technical exchange platform with subset of allies on critical material policy, research and development (R&D), shared challenges

- **Friendshoring & nearshoring – examples:**

- Canada
- Australia
- Japan
- South Korea
- Western Hemisphere

Key Bilateral Relationships for Cooperation on Critical Minerals



- **Technical collaboration:**

- Identifying shared risks and opportunities in creating domestic and regional supply chains, improving diversification
- Identify opportunities to increase mineral production efficiency & circular economy
- Improve the attractiveness to the market of specific projects
- Create opportunities to access finance

- Disruptive Innovation
  - DOE's CORE-CM Initiative coalitions are evaluating the potential for regional CM supply chains to be built using secondary/unconventional (e.g., coal) feedstocks
- Advancements to the State-of-the-Art
  - The Critical Materials Innovation Hub (CMI Hub) translated basic science discovery on mechanisms for separation of rare earth elements into engineered chemicals being commercialized through a public-private partnership
  - Innovative recycling technologies are accelerated through BIL provisions
- Deployment Ready!
  - Under BIL 40207, DOE has awarded \$2.8 billion in cost-share grants across the EV battery supply chain, including recycling infrastructure
  - Under the Advanced Technology Vehicles Manufacturing (ATVM) the Loan Programs Office has closed \$100M and committed another \$3,075M of loans for critical minerals projects



INVESTING IN AMERICA'S ENERGY FUTURE

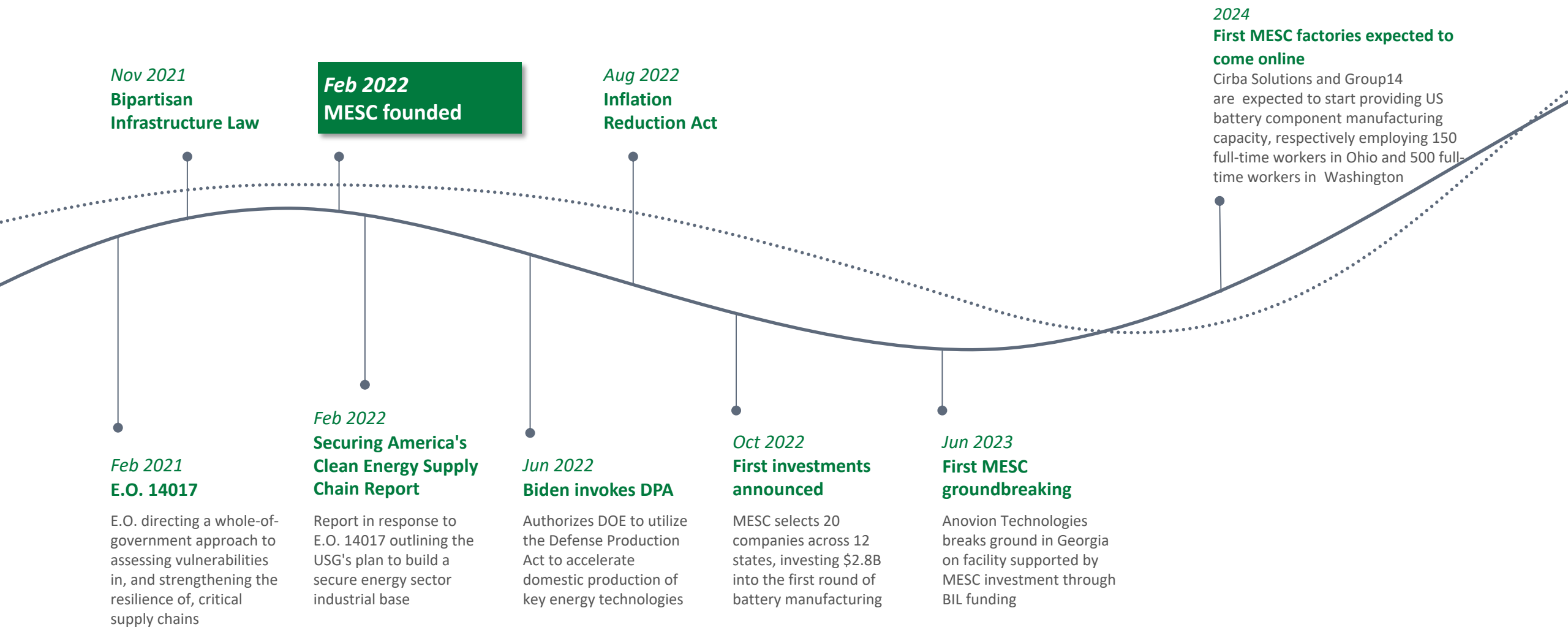


**MESCC**

OFFICE OF MANUFACTURING AND ENERGY SUPPLY CHAINS

# Office of Manufacturing and Energy Supply Chains

# MESC was founded in 2022 to secure and strengthen critical manufacturing and energy supply chains





# MESC's investment activities are underpinned by robust analytical modeling

## MESC's Core Functions

### Manufacturing Investing

*Strengthening and securing supply chains needed to modernize the nation's energy infrastructure, while supporting a clean and equitable energy transition*

### Workforce Investing

*Supporting workforce education and training through the direct funding of cutting-edge energy manufacturing programs*

### Manufacturing Analytics Backbone

*Robust modeling to guide and support DOE strategy and investments, private sector collaborative investments, and policy recommendations to broader USG*

Our **strategic investment in critical materials, workforce, and essential manufacturing** enables DOE's other major project offices (OCED, GDO, etc.) by **de-risking the supply chains** for transmission, hydrogen, carbon capture, and other emerging clean technology projects.

# Domestic public/private investments in the battery supply chain have grown greatly over the last several years



Over \$100B announced



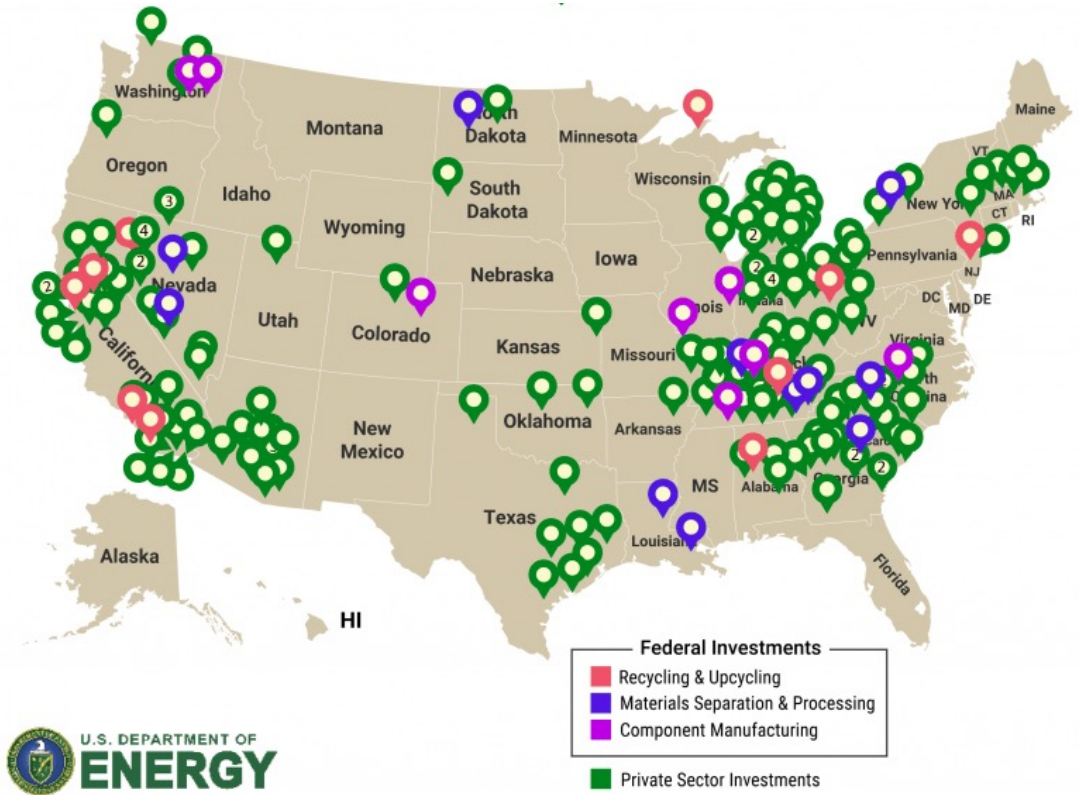
Over 200 new or expanded minerals, material processing, and manufacturing facilities



Enough to power 10M EVs each year



Over 75,000 new jobs



Based on publicly available information. Many facilities are conditional on financing, funding, site control, and other factors.

Source: <https://www.energy.gov/investments-american-made-energy>. August 2023.

# The USA is forecast to have enough cell manufacturing capacity to meet the Biden administration's EV sales goals for 2030



## Light Duty Vehicle

50% Light-Duty electric vehicle sales share

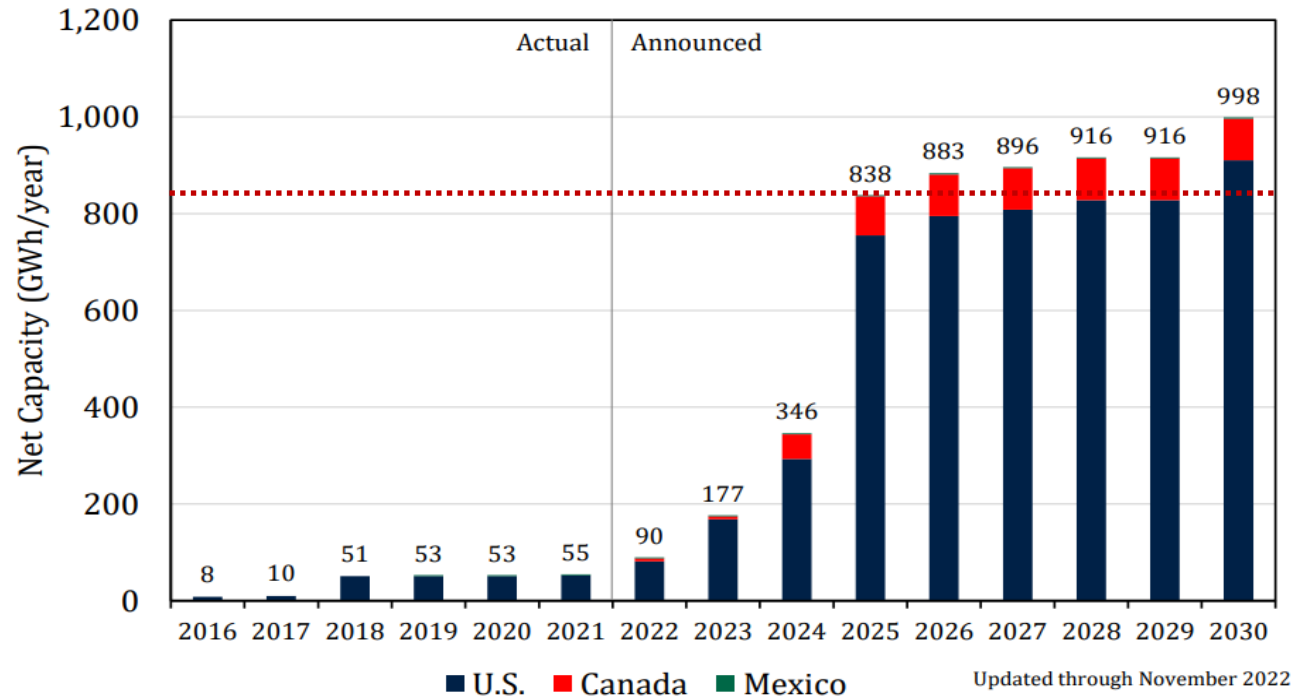
760 GWh



## Medium/Heavy-Duty Vehicle

30% Medium- and Heavy-Duty electric vehicle sales share

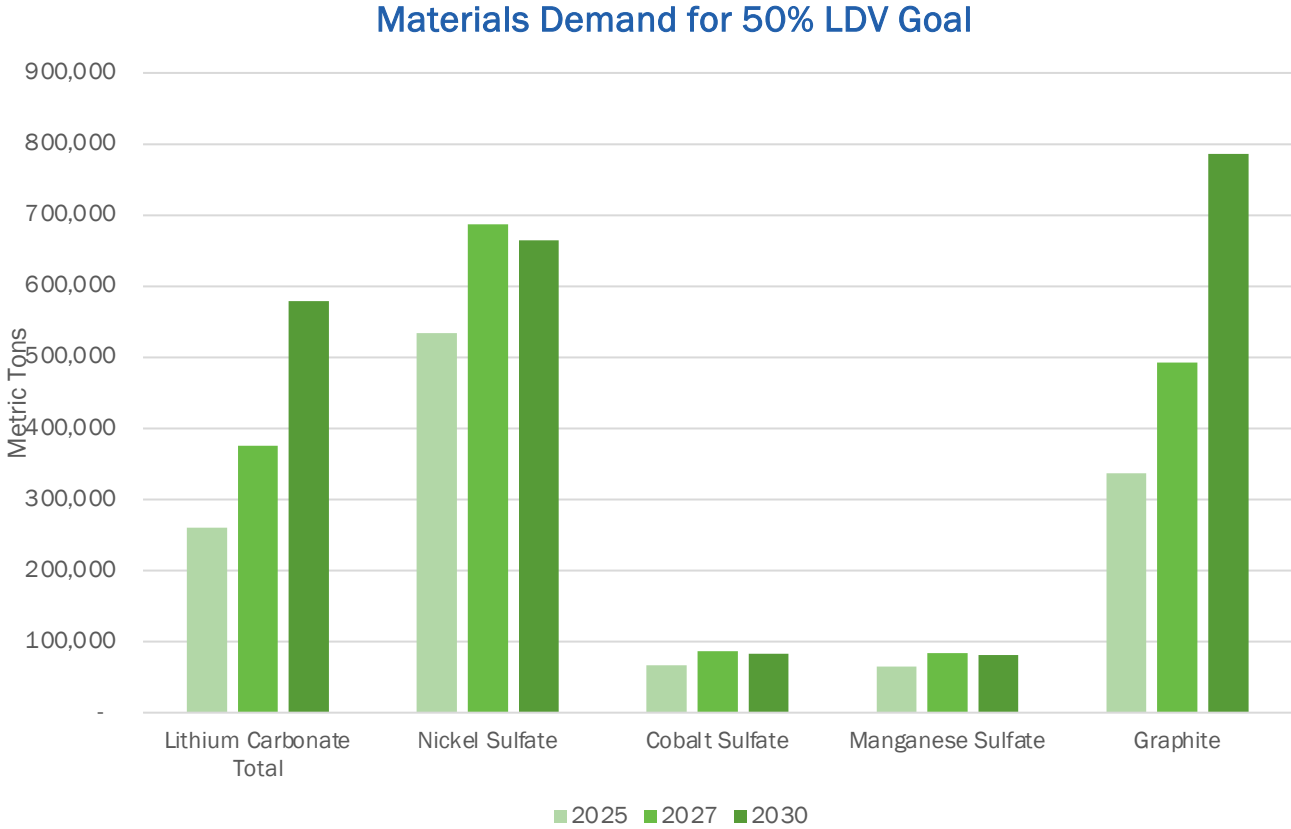
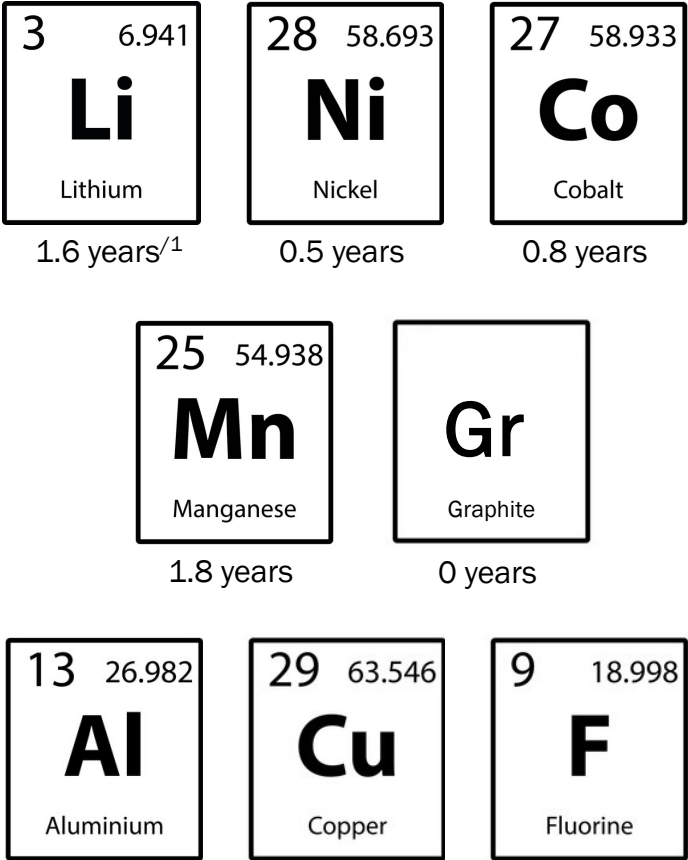
80 GWh



2030 Combined vehicle goals

Source:  
Assessment of Light-Duty Plug-in Electric Vehicles in the United States, 2010 – 2021: Announced Battery Plant Capacity in North America. Argonne National Laboratory. November 2022.

# The USA does not have enough known reserves of battery critical minerals and materials to supply the 2030 demand



/1 Does not include Salton Sea or Smackover brines















Internal MESC Analysis based on 15.2 M domestic vehicles sold by 2030 in US, [EIA AEO Sales Projection](#).  
 Assumes: 1) linear-rate increasing pack sizes to 100 kWh by 2030; 2) linear-rate of adoption; 3) 50% LFP and 50% NMC 811 in market, 100% Graphite anodes (SG/NG blend)

# Critical Mineral Related MESC funding

		Project	Federal Investment
Advanced Energy Manufacturing and Recycling Grants Program (40209)	Boston Metals	Ultrapure chromium metal, alloys & parts for clean power, fuel cells & green steel	\$50 million
	CorePower Magnetics	Advanced magnetic amorphous alloys for transformers and motors	\$20 million
Battery Materials Processing Grant Program (40207 b)	Albemarle	Lithium spodumene concentrate production from hard rock and brines	\$150 million
	American Battery Technology Company	Lithium direct extraction from domestic brine sources for lithium hydroxide production	\$58 million
	Anovion	Synthetic graphite production	\$117 million
	Novonix	Synthetic graphite production	\$100 million
	Ascend Elements	Precursor and cathode active material production from recycled critical mineral feedstocks	\$316 million, \$164 million
	Cirba Solutions	Battery recycling for high purity critical minerals	\$75 million
	Talon Nickel	Nickel sulfate production	\$114 million
	Applied Materials	Lithium metal anodes	\$100 million
Rare Earth Elements Demonstration Facility Grant Program	The University of North Dakota	Recover and refine rare earth elements and critical minerals from North Dakota lignite mine wastes	\$8 million
	West Virginia University	Rare earth elements and critical minerals using acid mine drainage and mineral tailings feedstocks	\$8 million
Qualifying Advanced Energy Project Tax Credit (48C)	\$800 million in investment credits towards critical materials recycling, processing, and refining facilities		



# MESC's current battery portfolio spans the supply chain

CATHODE		ANODE		Battery Materials	RECYCLING
 <p>New lithium processing plant that uses domestic sustainably extracted spodumene Location: Kings Mountain, NC</p>	 <p>Commercial production of Lithium Iron Phosphate cathode powder Location: St. Louis, MO</p>	 <p>First U.S.-owned and operated large-scale production of synthetic graphite anode material Location: Bainbridge, GA</p>	 <p>Construct an advanced prelithiation and lithium anode manufacturing facility Location: Lynchburg, VA</p>	 <p>First U.S. manufacturing plant for lithium hexafluorophosphate (LiPF6) electrolyte salt Location: St. Gabriel, LA</p>	 <p>Expansion and upgrade of lithium-ion recycling facility Location: Lancaster, OH</p>
 <p>Demonstration to produce multiple battery chemistries more cost effectively and sustainably Location: Jackson, TN</p>	 <p>Two awards, First commercial-scale, integrated metal extraction and pCAM facility in the USA Location: Hopkinsville, KY</p>	 <p>Commercial manufacturing of next-generation silicon-carbon composite anode material Location: Moses Lake, WA</p>	 <p>Construct a commercial-scale silicon anode production facility Location: Moses Lake, WA</p>	 <p>A new battery-grade polyvinylidene fluoride (PVDF) facility Location: Augusta, GA</p>	<p>MINERAL PROCESSING</p>  <p>Construct an advanced domestic battery minerals processing facility Location: Beulah, ND</p>
 <p>Demonstration of battery-grade lithium hydroxide from unconventional sedimentary resources Location: Tenopah, NV</p>	 <p>Mass production of lower carbon intensity synthetic graphite anode materials Location: Chattanooga, TN</p>				

# In November, DOE released an announcement for a second round of funding for 40207 b & c program

Application Window Closed January 9, 2024

Selectees expected late Summer 2024

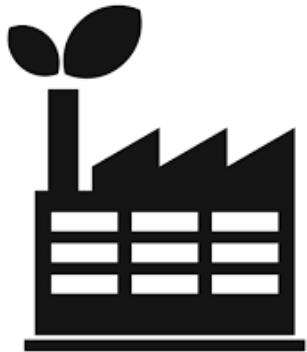
Fund Awarding Expected: \$2.5 billion with additional industry-matched cost-share

Topic Areas	Title
1	Commercial-scale Lithium Separation from Domestic Sources
2	Commercial-scale Separation, Processing, and Recovery of Battery Critical Minerals (non-Lithium)
3	Commercial-scale Domestic Processing of Crucial Precursor Materials for Battery Manufacturing
4	Commercial-scale Domestic Production of Battery Cathode/ Anode Materials and Cathode/ Anode Electrodes
5	Commercial-scale Domestic Production of Electrolyte Salts and Electrolyte Solvents
6	Commercial-scale Domestic Production of Cell Manufacturing for Small and Specialized Markets
7	Commercial-scale Domestic Production of Non-Lithium Based Battery Cell and Systems
8	Commercial-scale Domestic Manufacturing of Other Cell Components (Open Topic)

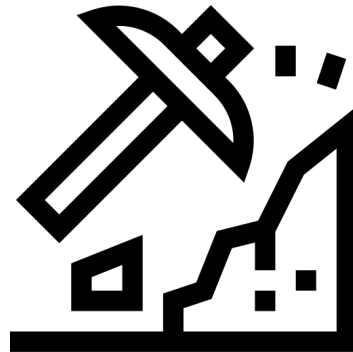
[Biden-Harris Administration Announces \\$15.5 Billion to Support a Strong and Just Transition to Electric Vehicles, Retooling Existing Plants, and Rehiring Existing Workers | Department of Energy](#)

# 48C Program invests in projects that re-equip, expand, or establish manufacturing facilities

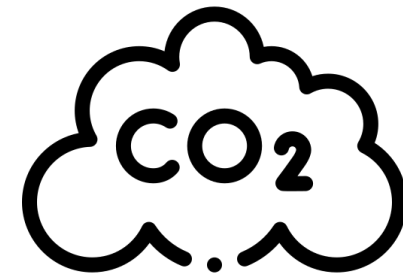
- \$10B of Federal tax (credits up to 30%) administered by the Department of Treasury and Internal Revenue Service, supported by DoE
- Round one of applications has closed and will provide \$4B of funding
- Round two applications are under review



For manufacturing or recycling of clean energy and energy efficiency technologies



To process, refine, or recycle critical materials



Re-equips manufacturing facility to reduce GHG emissions by 20%

# End of life component recycling and materials reclamation fulfill a critical role in the battery materials supply chain

- Under the BIL Sections 40207(e)(f), federal investments are designated to accelerate battery reverse logistics, second use, and material recovery

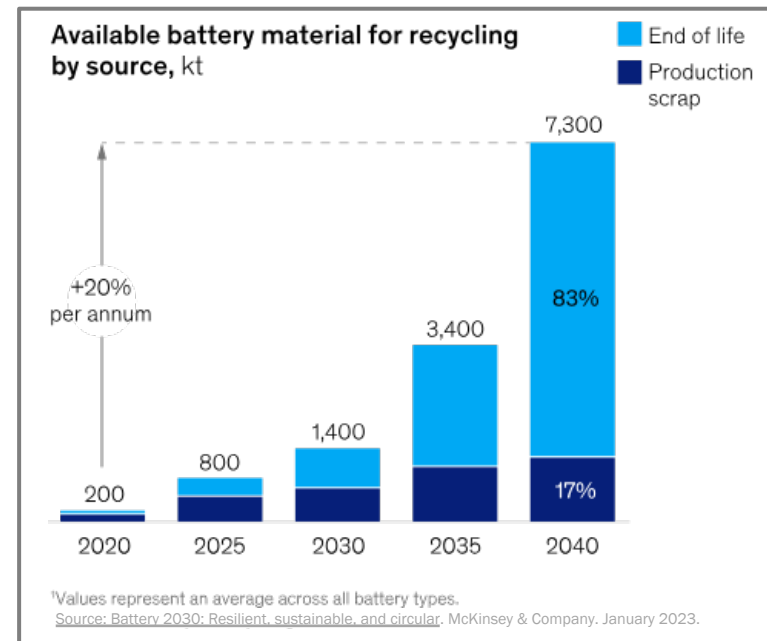


DoE and EPA are working together to develop a producer responsibility framework and provide grants for battery collection and recycling projects



## Department of Energy

- Retailer collection systems
- Battery material processing program
- Battery manufacturing and recycling
- Li-ion battery recycling prize competition
- EV battery design, recycling and reuse program
- RD&D on cost reduction for battery logistics and processing



## Environmental Protection Agency

- Best practices for battery recycling
- Voluntary battery labeling program



# Thank you

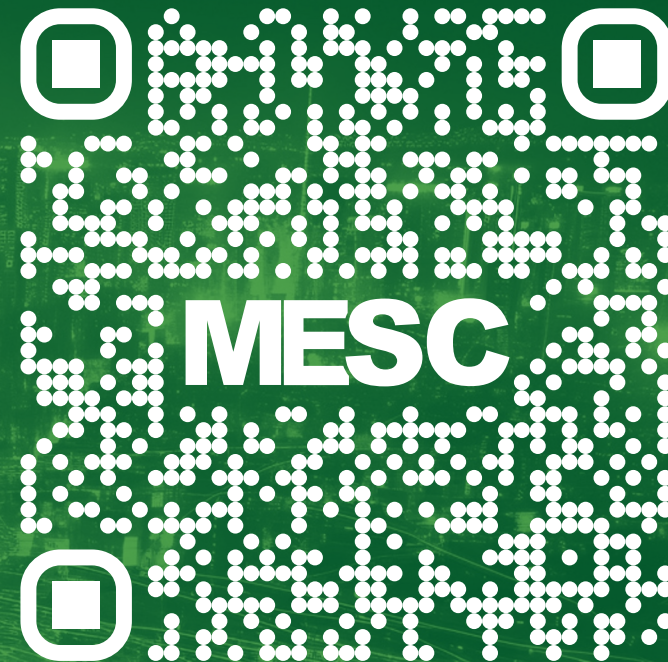
[energy.gov/mesc](https://energy.gov/mesc)



MESC@hq.doe.gov



Office of Manufacturing and Energy Supply Chains, U.S. Department of Energy



**MESC**  
OFFICE OF MANUFACTURING AND ENERGY SUPPLY CHAINS



# Deployment • Innovation • Liftoff

# Financing American Energy

**Title 17 Clean Energy • Advanced Transportation**  
**Tribal Energy • CO<sub>2</sub> Transportation Infrastructure**

University of Texas-Austin  
Workshop on Critical Minerals,  
National Security, and the Clean  
Energy Transition

David Kovatch, Senior Advisor

April 18, 2024

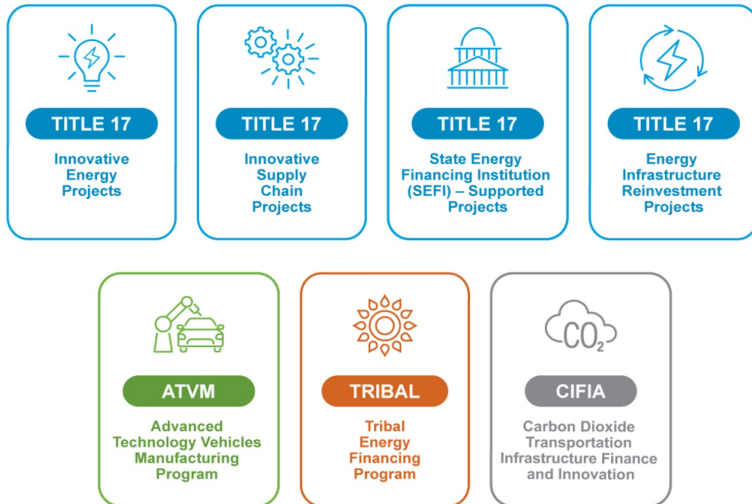


# What is the Loan Programs Office (LPO)?

## LPO is...

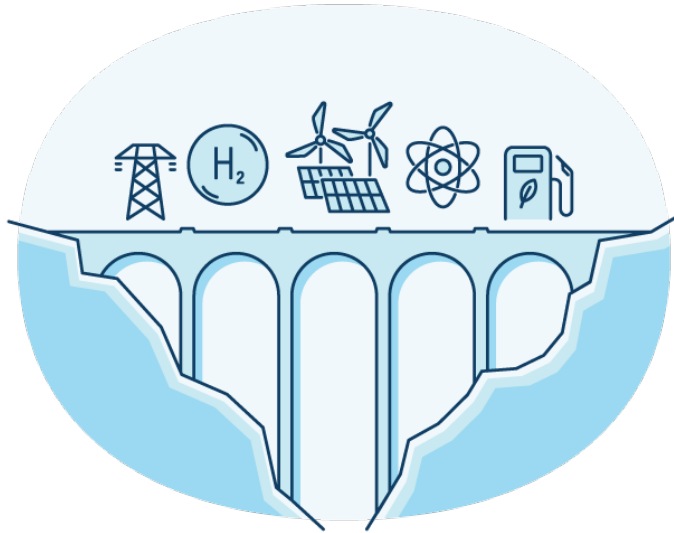
the **premier public financing partner** accelerating high-impact energy and manufacturing investments to advance America's economic future.

## How do we do it?

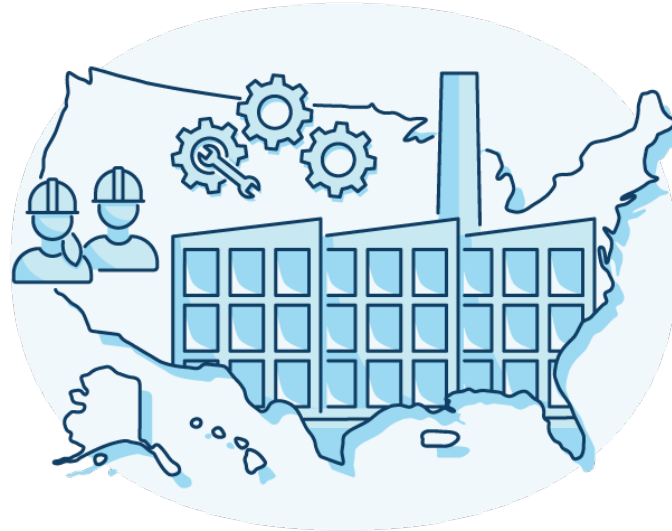


- ✓ By **providing attractive debt financing** for high-impact, large-scale (\$100M+) energy infrastructure projects in the U.S.
- ✓ With **tens of billions of dollars** in available loan and loan guarantee authority.
- ✓ Via **seven loan programs & project categories** supporting both innovative and commercial technologies.

# LPO Administers Loan Programs that:



**Provide a bridge to bankability for emerging clean energy and decarbonization technologies on a path to commercial liftoff**



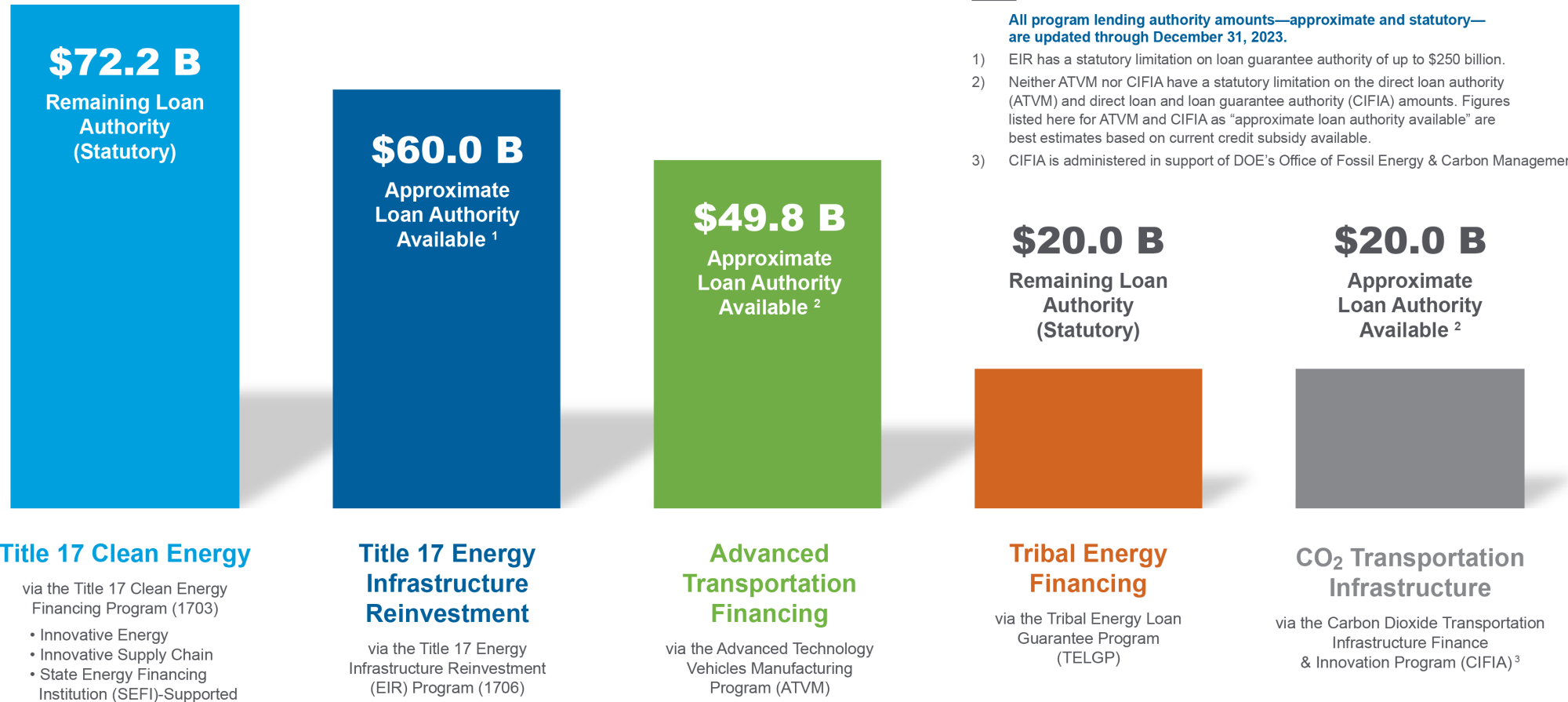
**Enable the expansion of domestic manufacturing and supply chains to support a cleaner and stronger energy economy**



**Make the clean energy transformation affordable and achievable for workers, consumers, and communities who stand to benefit from LPO support**

# Monthly Application Activity Report December 2023

## Estimated Remaining Loan Authority for LPO Financing Programs



**Notes**

All program lending authority amounts—approximate and statutory—are updated through December 31, 2023.

- 1) EIR has a statutory limitation on loan guarantee authority of up to \$250 billion.
- 2) Neither ATVM nor CIFIA have a statutory limitation on the direct loan authority (ATVM) and direct loan and loan guarantee authority (CIFIA) amounts. Figures listed here for ATVM and CIFIA as “approximate loan authority available” are best estimates based on current credit subsidy available.
- 3) CIFIA is administered in support of DOE’s Office of Fossil Energy & Carbon Management.

**Title 17 Clean Energy**

via the Title 17 Clean Energy Financing Program (1703)

- Innovative Energy
- Innovative Supply Chain
- State Energy Financing Institution (SEFI)-Supported

**Title 17 Energy Infrastructure Reinvestment**

via the Title 17 Energy Infrastructure Reinvestment (EIR) Program (1706)

**Advanced Transportation Financing**

via the Advanced Technology Vehicles Manufacturing Program (ATVM)

**Tribal Energy Financing**

via the Tribal Energy Loan Guarantee Program (TELGP)

**CO<sub>2</sub> Transportation Infrastructure**

via the Carbon Dioxide Transportation Infrastructure Finance & Innovation Program (CIFIA)<sup>3</sup>



# What LPO Offers Borrowers

**LPO loans and loan guarantees** are differentiated in the clean energy debt capital marketplace in **three primary ways:**



## Access to Patient Capital

that private lenders cannot or will not provide.



## Flexible Financing

customized for the specific needs of individual borrowers.



## Committed DOE Partnership

offering specialized expertise to borrowers for the lifetime of the project.

# Monthly Application Activity Report March 2024

# 203

**ACTIVE APPLICATIONS**<sup>1</sup>

# \$262.2

**BILLION IN LOANS REQUESTED**<sup>2</sup>

# 1.8

**NEW APPLICATIONS PER WEEK**<sup>3</sup>

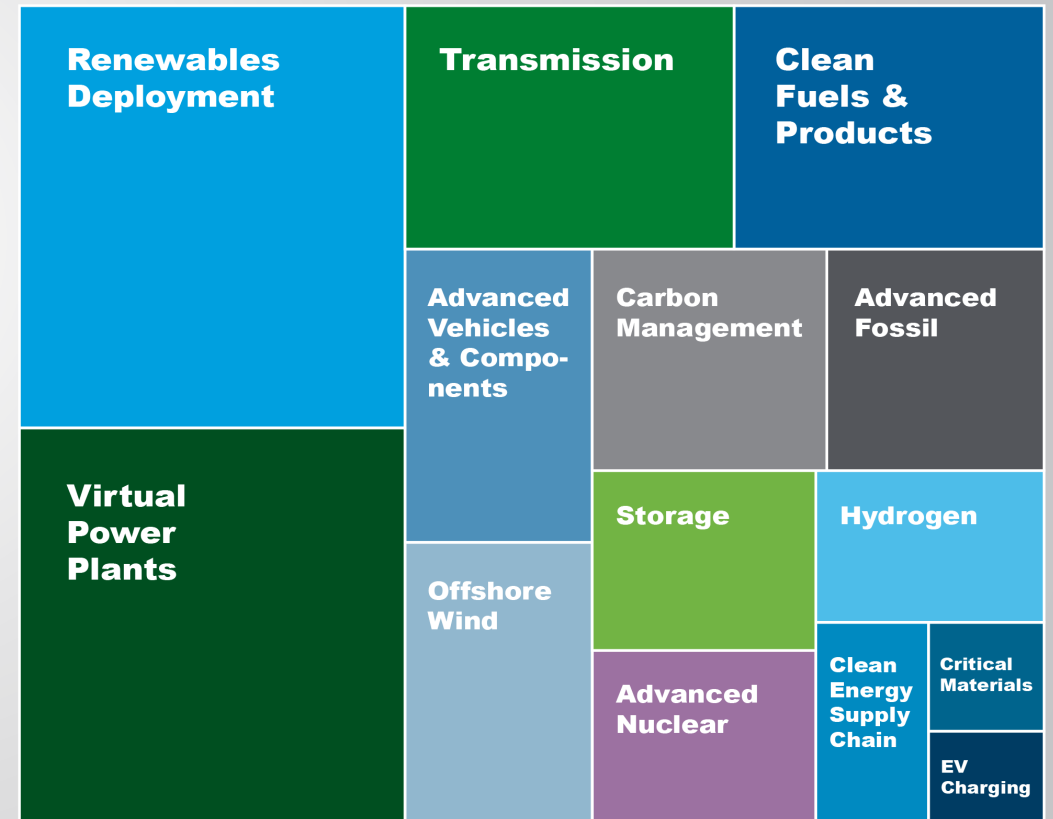
**Notes**

All data updated through March 31, 2024. For more details and a list of technology areas of interest within each LPO tech sector, see: [Energy.gov/LPO/MAAR](https://www.energy.gov/LPO/MAAR)

- 1) Active applications include applications that have been submitted by the project sponsor(s) through LPO's online application portal and are in different stages of active review and engagement by LPO and the applicant.
- 2) Individual requested loan amounts are estimated and potential, subject to change, and not necessarily representative of final financing terms. **Requested loan amounts in current active applications do not affect available LPO loan authority.** Figure rounded down to the nearest \$0.1 billion.
- 3) Current rolling average of new active applications per week over the previous 24 weeks. Figure rounded down to the nearest 0.1 application per week.

## \$262.2 BILLION

CURRENT AMOUNT OF LOANS REQUESTED BROKEN DOWN BY PROJECT TECHNOLOGY SECTORS





# Title 17 Clean Energy Financing

(Title 17)

Loan guarantees for the deployment of innovative energy projects at commercial scale

## Four Project Categories

1. Innovative Energy (1703)
2. Innovative Supply Chain (1703)
3. State Energy Financing Institution (SEFI)-Supported (1703)
4. Energy Infrastructure Reinvestment (EIR) (1706)

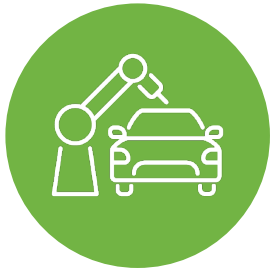
## Project Eligibility

1. Project located in the United States.
2. Be an energy project.
3. Achieve significant and credible GHG or air pollution reductions.
4. Have a reasonable prospect of repayment.
5. Involve technically viable and commercially ready technology.
6. Include a Community Benefits Plan.

## Loan Guarantee Features

- LPO can offer 100% guarantee of U.S. Treasury's Federal Financing Bank (FFB) loans or partial guarantees of commercial loans.
- Senior secured debt priced competitively with commercial rates.
- DOE can serve as sole lender or as a co-lender.
- Structures may include project finance or structured corporate financing.





# Advanced Transportation Financing (ATVM)

Manufacturing of vehicles, components, and EV charging infrastructure

## Project Eligibility

1. New facilities or reequip/modernize/expand existing facilities in the U.S. and/or related engineering integration for eligible vehicles
2. Light-duty vehicles that meet specified fuel economy requirements or ultra-efficient vehicles.
3. Manufacturing lending authority has been expanded to facilities for the manufacturing of medium- and heavy-duty vehicles, locomotives, maritime vessels including offshore wind vessels, aviation, and hyperloop.
4. Applicable across the value chain including materials, components, suppliers, OEMs, EV charging or alternative fueling infrastructure.

## Direct Loan Features

- Direct loan from U.S. Treasury's Federal Financing Bank (FFB).
- Senior secured, fixed rate debt.
- Pricing equal to U.S. Treasury-equivalent yield curve with zero credit spread.
- Debt amount based on credit profile, business plan, market risk, technology, cash flows, project risk allocation and other relevant factors.
- Tenor of up to 25 years or useful life of the assets financed.
- DOE can serve as sole lender or as a co-lender.
- Structures may include corporate, structured corporate or project finance loans.

# A History of Portfolio Success

Over \$26 billion in loans and commitments to the U.S. battery, EV, and critical minerals sectors

ADVANCED VEHICLES & COMPONENTS

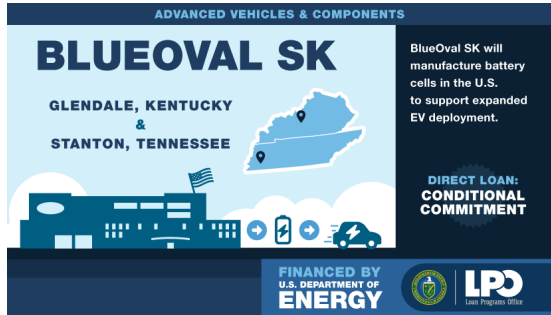
## BLUEOVAL SK

GLENDALE, KENTUCKY & STANTON, TENNESSEE

BlueOval SK will manufacture battery cells in the U.S. to support expanded EV deployment.

DIRECT LOAN: CONDITIONAL COMMITMENT

FINANCED BY U.S. DEPARTMENT OF ENERGY



## Advanced Vehicles & Components | \$21.3 Billion

Accelerated domestic electric vehicles manufacturing.  
(ABS, CelLink, BlueOval SK, Ford, Nissan, SK Siltron, Tesla, Ultium Cells)

ADVANCED VEHICLES & COMPONENTS

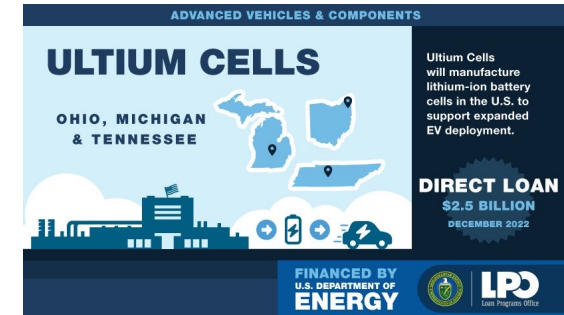
## ULTIUM CELLS

OHIO, MICHIGAN & TENNESSEE

Ultium Cells will manufacture lithium-ion battery cells in the U.S. to support expanded EV deployment.

DIRECT LOAN \$2.5 BILLION  
DECEMBER 2022

FINANCED BY U.S. DEPARTMENT OF ENERGY



CRITICAL MATERIALS

## SYRAH VIDALIA

VIDALIA, LOUISIANA

The first battery-grade natural graphite active anode material supplier in the U.S., supporting the growing EV industry.

DIRECT LOAN \$102 MILLION  
JULY 2022

FINANCED BY U.S. DEPARTMENT OF ENERGY



## Critical Minerals and Materials | \$3.2 Billion

Supporting domestic supply chains for electric vehicles battery manufacturing in the U.S. (Rhyolite Ridge, Syrah Vidalia, Thacker Pass)

CRITICAL MATERIALS | ADVANCED TECHNOLOGY VEHICLES MANUFACTURING

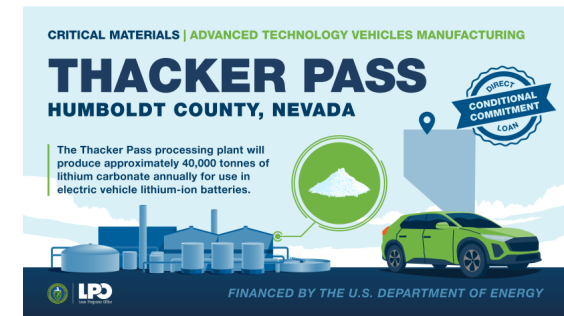
## THACKER PASS

HUMBOLDT COUNTY, NEVADA

The Thacker Pass processing plant will produce approximately 40,000 tonnes of lithium carbonate annually for use in electric vehicle lithium-ion batteries.

DIRECT LOAN

FINANCED BY THE U.S. DEPARTMENT OF ENERGY



CRITICAL MATERIALS

## RHYOLITE RIDGE

ESMERALDA COUNTY, NEVADA

Rhyolite Ridge will process lithium carbonate to support the domestic EV battery supply chain.

DIRECT LOAN: CONDITIONAL COMMITMENT

FINANCED BY U.S. DEPARTMENT OF ENERGY



## Recycling | \$2.375 Billion

Supporting domestic supply chains for electric vehicles battery manufacturing in the U.S. (Li-Cycle, Redwood Materials)

CRITICAL MATERIALS

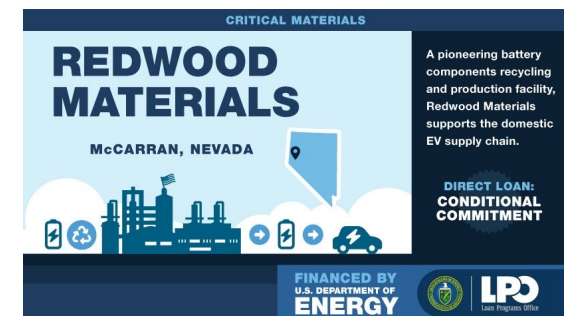
## REDWOOD MATERIALS

McCARRAN, NEVADA

A pioneering battery components recycling and production facility, Redwood Materials supports the domestic EV supply chain.

DIRECT LOAN: CONDITIONAL COMMITMENT

FINANCED BY U.S. DEPARTMENT OF ENERGY



# Good Governance in Portfolio Management

Proactive risk & portfolio management as responsible stewards of taxpayer resources

## Program Management Operations

Strategic Improvements

- Fill key positions in management with **experienced professionals**
- **Clarify authorities** & accountabilities of managers
- Establish and effectively **communicate clear goals** for management
- Proactively **protect the taxpayers' interest**
- Engage in **long-run strategic planning** for the programs
- **Improve reporting** to the public
- **Strengthen & restructure internal oversight** of the programs
- Establish **external oversight**

## Portfolio Surveillance

Strategic Improvements

- Create a **comprehensive management information reporting** system
- Establish a protocol for **timely reporting of critical information**
- **Incorporate lessons learned** into policies, procedures, reporting and decision making



LPO-supported projects reduce greenhouse gas emissions and create American jobs

over

**104 million**

MWh clean energy produced



equivalent to...

over

**9.8 million**

homes powered



over

**47 million**

tons of CO<sub>2</sub> displaced



**21.5 million**

advanced technology vehicles produced



equivalent to...

**2.9 billion**

gallons of gasoline saved



**26 million**

tons of CO<sub>2</sub> displaced



OVER

**46,800**

permanent jobs created



*NOTE: Emissions and job impacts attributable to LPO-supported portfolio projects, cumulative through Q4 FY2023.*

# The LPO Loan Transaction Process

LPO engages early with applicants and remains a partner throughout the lifetime of the loan

