

Welcome to the **TRACE-Ga OSS**

THIS WEBINAR IS RECORDED AND WILL BE PUBLISHED ONLINE

Warning:

**No .ai bots
permitted**

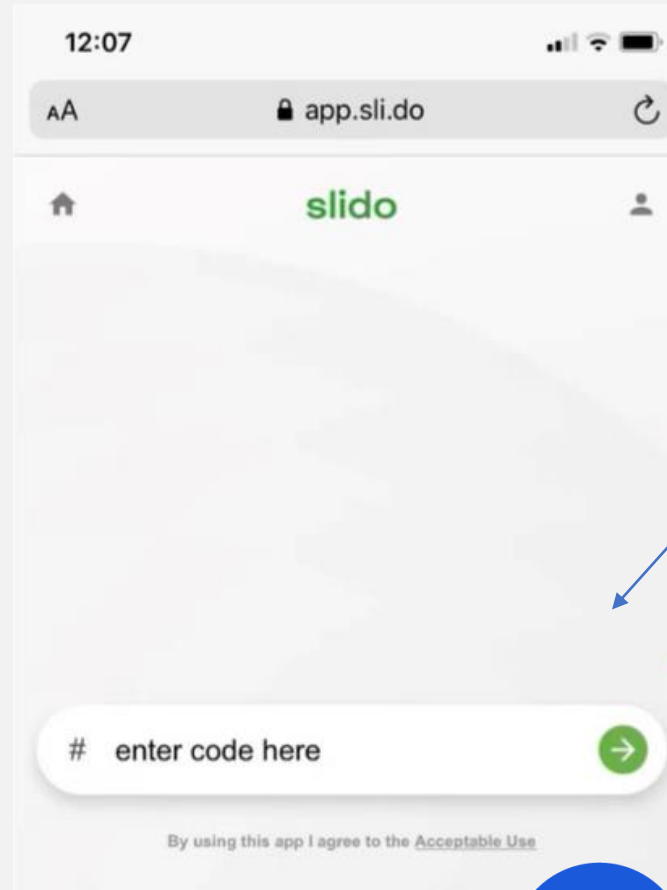
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Questions in chat will not be answered. **Please Submit all questions in Slido only.**

September 30, 2025

Technology for Recovery and Advanced Critical-material Extraction – Gallium (TRACE - Ga)

Objective Strategic Session Webinar



U.S. DEPARTMENT
of ENERGY

Fossil Energy and
Carbon Management



Agenda & DOE Speaker

- Overview of DOE Critical Mineral Activities
- Overview of FECM Mineral Processing and Production Program
- TRACE-Ga overview and objectives
- Deep dive into application materials and requirements
- Q&A



Burt Thomas

Division Director, Mineral Production and
Processing Technologies,
Office of Fossil Energy and Carbon
Management, U.S. Department of Energy

Overview of DOE Critical Material Activities



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DOE is the national steward for commercialization and innovation for energy and manufacturing

DOE's primary role is to advance research, development, demonstration, and commercial deployment spanning basic science to technology innovation.

- Supported by analyses, domestic and international standards, and international collaboration with allied countries.

DOE maintains the most USG expertise in critical minerals mining and processing technology, and project financing.

- Frequently supports other agencies (UST, Commerce, USTR) in rulemakings, investigations, and other analyses.

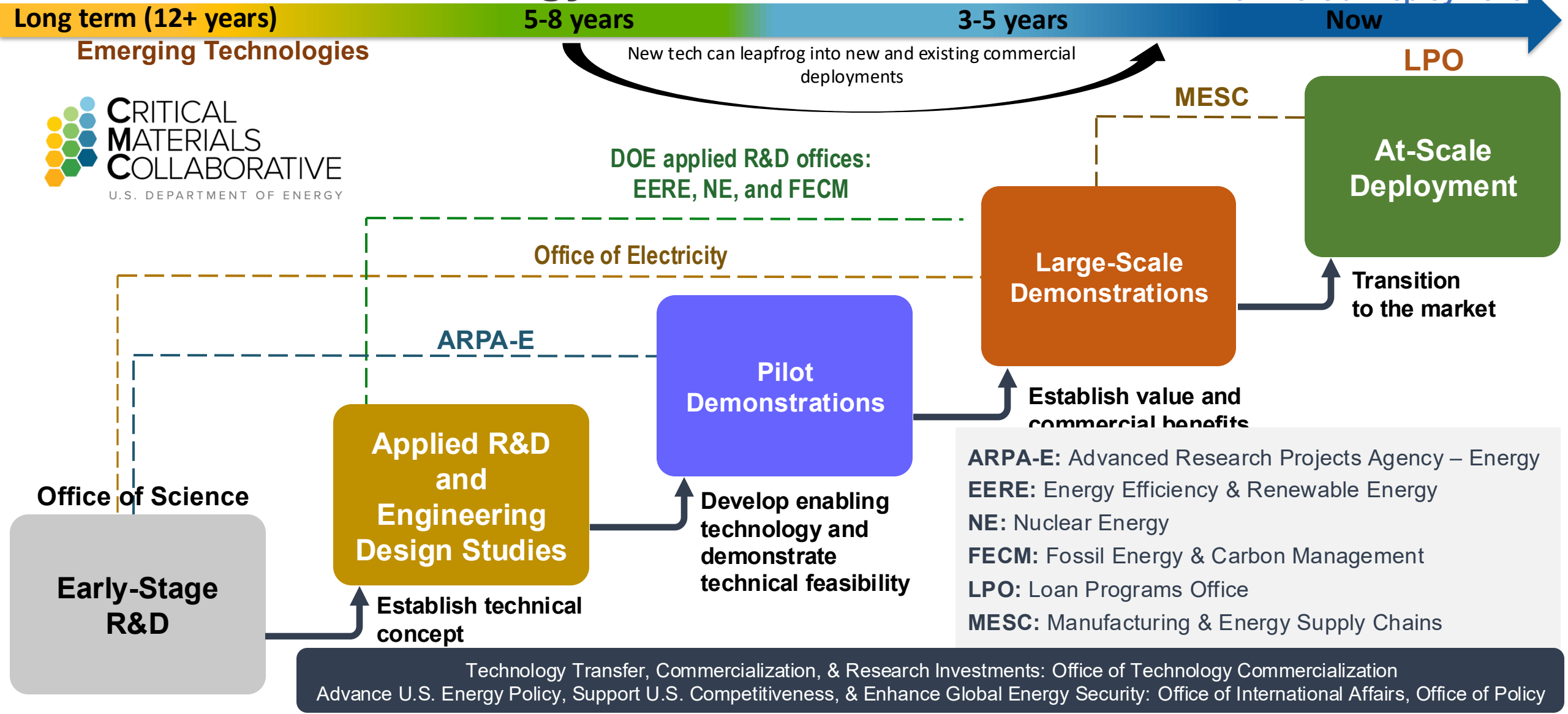
Critical Minerals & Materials Program Framework	 Diversify & Expand Supply	 Develop Alternatives	 Improve Material & Manufacturing Efficiency	 Reuse & Recycle
	 Conduct Enabling Activities			
 Basic Science	Critical Minerals and Materials Program Framework - Signed into law by President Trump in the Energy Act of 2020 (7002(g)) - Base funding: \$768 million enacted from FY2022 to FY2024 for CMM innovation, efficiency, and alternatives - IJA appropriations: \$600 million for CMM Program (41003(c)) and \$75 million for critical material supply chain research facility (41003(d)) - CMM supply chain authorities: - IJA appropriations: \$6 billion for commercial minerals, materials processing, battery manufacturing, and recycling - Title 17 Innovation Energy Loan Guarantee Program & Advanced Technology Vehicle Manufacturing Direct Loan Program			
 Applied R&D				
 Pilots				
 Demonstrations				
 Commercial Deployment				

DOE has long history of supporting new resource production

Geothermal Wind Solar
Unconventional Oil and Gas Carbon Storage



DOE Offices bring unique capabilities to support full supply chain and technology readiness needs



Overview of FECM Mineral Processing and Production Program



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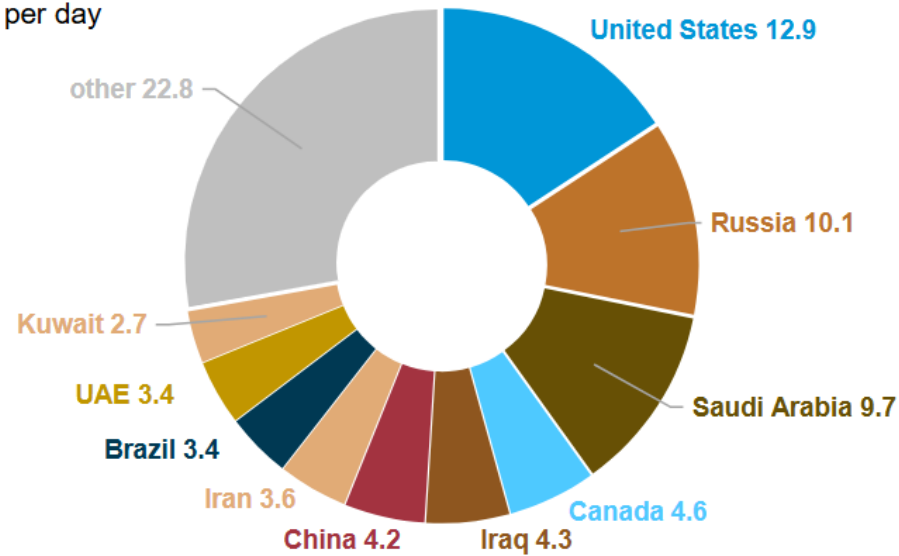
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What American Innovation Has Done With Oil And Gas, We Can Do For Minerals

The U.S. leads the world in oil production because of innovation.

Global crude oil and condensate production in 2023 by select countries
million barrels per day

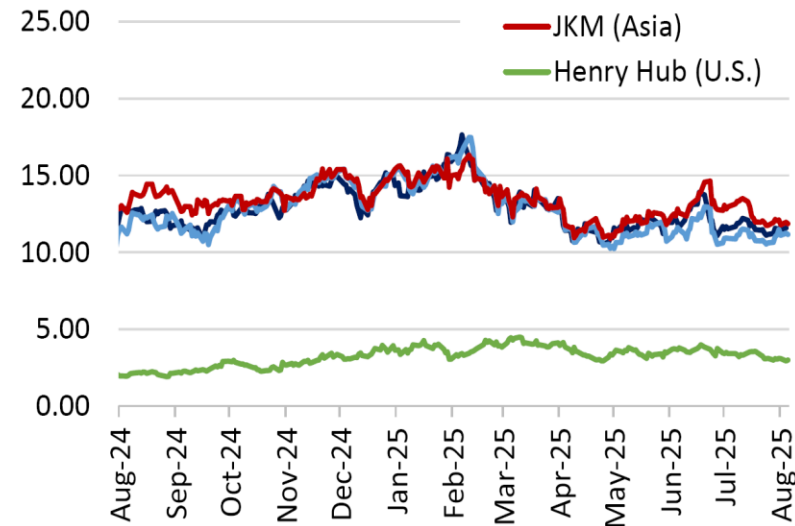


Source: U.S. Energy Information Administration, International Energy Statistics

American gas is abundant and affordable because of innovation.

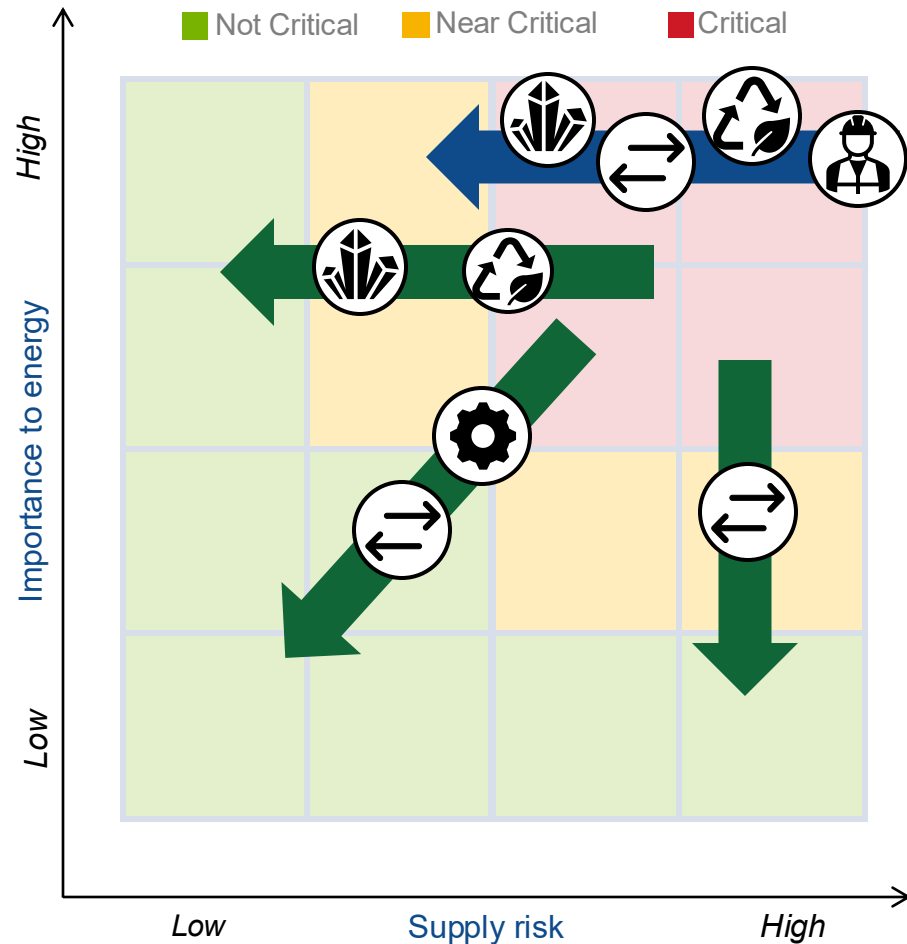
Global Natural Gas Prices

\$/MMBtu



Source: Bloomberg Daily Market Update, 8/5/25

Immediate Actions Address the Crisis | Strategic R&D Wins the Future



Immediate Impacts

- US Industrial Byproducts
- Recycling
- Demand-Side Response
- Capacity Builds

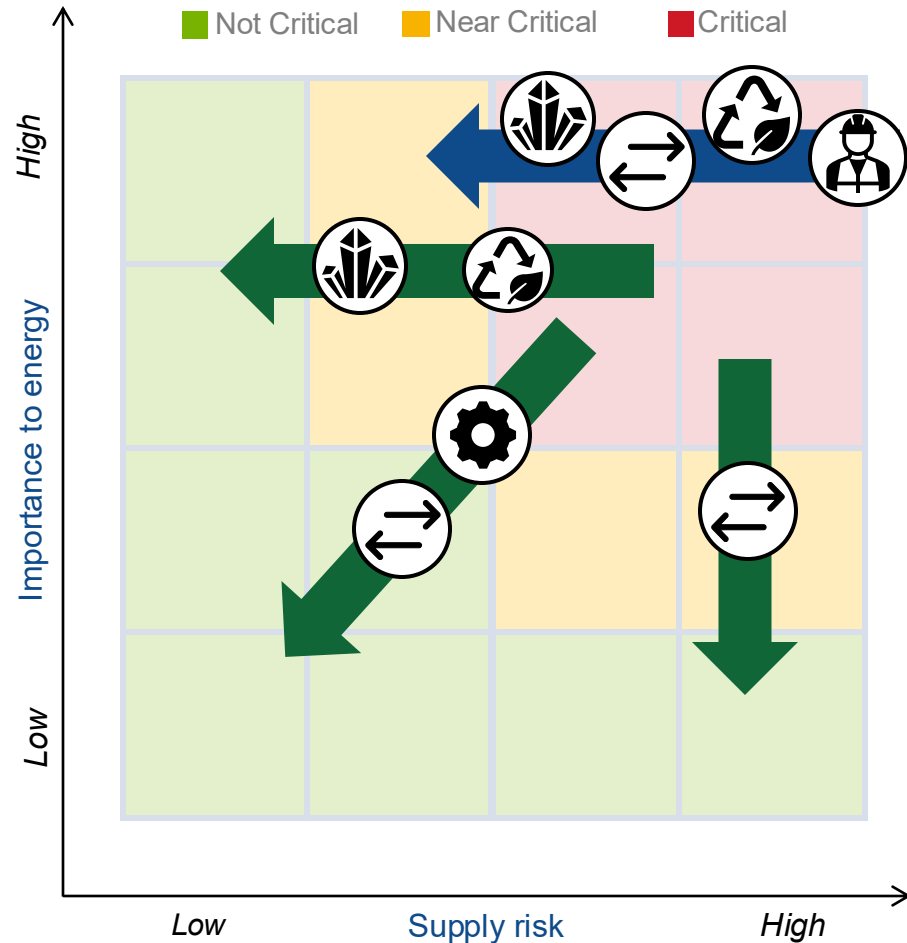
Winning the Long Game

- Diversify Sources and Expand Supply
- Develop Alternatives
- Improve Materials and Manufacturing Efficiency
- Reuse and Recycle



Today's industry workforce will provide immediate impacts.

Immediate Actions Address the Crisis | Strategic R&D Wins the Future



Immediate Impacts

TRACE-Ga



US Industrial Byproducts



Demand-Side Response



Recycling



Capacity Builds

Winning the Long Game



Diversify Sources and Expand Supply



Develop Alternatives



Improve Materials and Manufacturing Efficiency



Reuse and Recycle

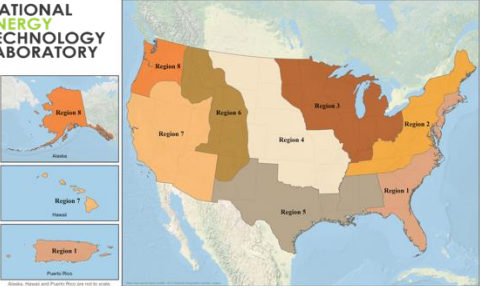
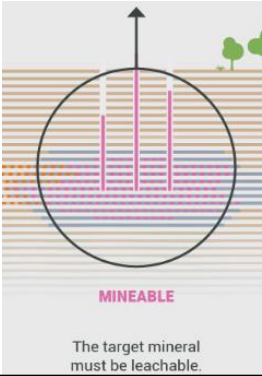


Today's industry workforce will provide immediate impacts.

Domestic Industries Will Build the Secure Minerals Future

Fossil Energy Minerals Division Programs and Major Investments

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and Carbon Management

Characterization Program	Processing Program	Carbon Ore Program	METALLIC Minerals to Materials Supply Chain Research Facility	New Mining Technology
Prospectus of Unconventional CMM HERMES: National Laboratory Collaborative Characterization Technologies Development CORE-CM: Regional Consortium for Supply Chains EDX-CLAIMM PROMMIS: National Laboratory Collaborative 	Novel Processes CMM Recovery from Coal, Industrial Processes, and Wastes Scaling Up TRACE-Ga Innovative Technologies and Alternatives (3105) 	Building Materials Energy Storage Fiber Chips and Electronics 	9- NLC (~150 DOE Experts) \$75M equipment (+\$500M ex.) Vertically Integrated Testbeds Accelerate Deployment METALLIC Signature Projects: "Mine to Magnet" "Waste to Space" "Muck to Graphite" "Special Alloy Metallization" STRATEGY AREAS KEY  Diversify Supply  Develop Alternatives  Improve Efficiency  Reuse and Recycle	Novel Technologies Mines of the Future Mining Industry Relevant R&D In Situ Approaches 
Strategy Areas  	   	  	  	  

TRACE-Ga Overview and Objectives



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TRACE-Ga Overview

- **TRACE-Ga Goal:** Restart domestic primary gallium recovery for the first time in almost 40 years.
- **Focus:** Innovative technologies for gallium recovery from U.S. metal processing feedstocks.
- **Project End Goal:** Projects will test and validate prototype technologies with a goal of producing at least 50 kg of pure gallium from at least one 14-day campaign of continuous operation with a real-world metal industry processing stream.
- **Funding:** Up to \$5M federal, 20% non-federal cost share.
- **Number of Awards:** DOE expects 1–3 projects awarded.

Phases & High-Level Objectives

Phase Requirements

	Feedstock	Amount (Verified by 3rd Party)	Purity (Verified by 3rd Party)	Length of Campaign	Anticipated Duration of Phase
Phase 1	Actual metal processing stream	≥ 100 grams of Ga	Any	Not defined	<i>Whenever complete</i> – 9 months
Phase 2	Actual metal processing stream	≥ 50 kilograms of Ga	4N (99.99%)	One 14-day campaign of continuous operation	<i>Whenever complete</i> – 24 months



Tips

Don't Forget:

- Flow diagrams, cost baselines, and cash flow projections.
- Standards, compliance reports, and other reports that are necessary for acquiring additional financing.

Deep Dive into Application Materials and Requirements



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How to Apply Requirements

- **Cover Page:** 1 page summary.
- **Technical Volume:** Up to 10 pages.
 - Address review areas.
 - Previous data to demonstrate the novelty and technical readiness.
 - Proof or credible plan that technology and project can recover 50kg of Ga from single 14-day campaign.
- **Workplan:** Up to 5 pages.
 - Defines major tasks, milestones & budgets.
 - Monthly milestones, with a milestone each quarter as a major project milestone.
 - Demonstrates 20% cost share.
- **Letters of Support:** Ensure technology developer and industrial feedstock supplier are on the same page (no limit).
- **Resumes:** 2 pages max per key staff.
 - Required for every key personnel.
- **PDF submission with naming conventions.**

Cover Page Template

We provide a template for the applicant's cover page, which will be a project snapshot to refresh the reviewers' memory when we begin discussing all applications.

TRACE-Ga – [NAME OF PROJECT] – Cover Page

Project Title:		
Lead Applicant:		
Lead Technical Contact:	Lead Administrative Contact:	
Project Partner Lead Contact:		
Project Location(s):		
Total Project Budget:	Total DOE Share (80%):	Total Applicant Cost share (20%):
Outline of approach to testing and validation:		
Overall details on the intended testing campaign:		
Expected Outcomes of the project:		
Additional key information:		

Workplan Template: Task Table

In the Phase 1 and Phase 2 Task Tables, define and describe the major tasks to be performed by the project team throughout the course of the project, including identifying milestones, duration, and budget for each task.

Task Table			
Phase 1			
Task	Total DOE budget share (80%)	Applicant budget share, (20%)	Total project budget
Task 1: <i>Take name & Description of activities performed under task</i> Milestone(s) Short Name and Month Number: <i>e.g. Acquire metal stream sample (M1)</i> Task Expected Duration: <i>e.g., M1-M12 – M refers to month and M1 is the first month when project activities start.</i>	\$80,000	\$20,000	\$100,000
Task 2: Milestone(s) Short Name and Month Number: Task Expected Duration	\$160,000	\$40,000	\$200,000
Task 3: Milestone(s) Short Name and Month Number: Task Expected Duration	\$400,000	\$100,000	\$500,000
<i>Add additional rows as necessary</i>			
	\$640,000 [TOTAL DOE BUDGET SHARE]	\$160,000 [TOTAL APPLICANT BUDGET SHARE]	\$800,000 [TOTAL PROJECT BUDGET]

i

Tips

- Include a task table for **each phase**.
- The **federal and applicant budget** is defined at the **task level**.
- Milestones are **identified in the task table** but **defined in the milestone table**.
 - In the task table, you will need to provide milestone short name and month.

Workplan Template: Milestone Table

In the **Milestone Table**, further define the milestones identified in the task table. Milestones are reported monthly, should demonstrate a technical achievement (e.g., major outcome or deliverable) rather than simply completing a task and should be Specific, Measurable, Achievable, Relevant, and Timely (SMART). One milestone per quarter (one every three months) should be identified as a major project milestone.

Milestone Table			
Phase 1			
Month Number	Milestone Short Name	Milestone description	Task Number
Distinguish quarterly major milestones	Matches task table	A milestone should demonstrate a technical achievement (e.g., major outcome or deliverable) rather than simply completing a task. SMART milestones should be Specific, Measurable, Achievable, Relevant, and Timely.	Matches task table
Example M1	Acquire metal stream sample	10 liters of metal processing stream sample delivered to ABC lab for bench scale testing of recovery technology	Task 1
M2			
(Insert more rows as needed)			



Tips

- This is likely developed iteratively with the Task table.
- **How do I know if my milestone is SMART enough?** A milestone is SMART if it is clear and unambiguous on what success looks like, with specific, measurable outcomes that are realistically achievable within a set timeframe.

Technical Volume Template

TRACE-Ga – [NAME OF PROJECT] – Technical Volume

Technical Volume Summary

- Text

Key area 1: Project Approach and Workplan

- Text

Key area 2: Technology Description, Innovation, and Readiness

- Text

Key area 3: Technology integration, Market Opportunity and Commercialization potential

- Text

Key area 4: Team Qualifications and Resource Availability

- Tables
- Text



Tips

- You are encouraged to organize the technical volume as shown in the template.
- You CAN re-order if helpful for the narrative but should **ensure that the key area is defined**.
- The technical volume should include relevant supplemental information (e.g., data tables, patent claims, flowsheets, preliminary economic analysis studies) as part of the submission, including figure labels.

Technical Volume Template: Team Qualifications and Resource Availability

In the table below, identify key personnel participating in the project and describe their capabilities, expertise, responsibilities, and relevant resources (e.g., equipment, facilities, downstream processing) being leveraged. Report cost share at the organization level.

Organization:	ORGANIZATION # 1
Description:	
Responsibilities:	Describe organizational capabilities, expertise, and resources
Cost share:	Responsibilities: Identify major activities led by this organization
Staff:	Cost share commitment: \$X / X% of total project cost
Key Personnel:	Staff: Identify only key personnel that would work on this project with brief description of bio/capabilities)
Organization:	Key Person: Name
Responsibilities:	Organization or project title:
Key Personnel:	Responsibilities: Identify major activities led by this key person
Organization:	Key Personnel: Name
Responsibilities:	Organization or project title:
Note:	Responsibilities: Identify major activities led by this key person
	Note: add additional rows as necessary

Tips

- Have separate tables for each participating organization.
- Your submission should include a resume for each key personnel.
- Only the first two pages of each key person resume will be reviewed.
- Staff can acknowledge positions that would need to be hired to execute the project and personnel that support the project in a more adjacent capacity.

Review Criteria

FECM will determine whether the **applicant** has sufficiently:

1. Developed a project plan to achieve TRACE-Ga objectives,
2. Developed and de-risked novel Ga recovery technology,
3. Developed a business plan that supports further scale-up and commercialization of the Ga recovery technology, and
4. Acquired access to (or has a credible plan to access) the industrial partner, the metal industry processing stream, and proper facilities and equipment needed to validate the technology under operational conditions.



Tip

Also note how these align with the workplan template.

Eligibility Requirements

- **Evidence** of success for **recovering gallium from feedstock** representative of the proposed metal industry process stream.
- A **letter of support from the industrial partner** for the metal processing stream, and any other company, agency, or other party that has ownership/rights to any proposed feedstock materials or technology, where applicable.
- Description of the **potential for scale-up** at the initial metal industry processing stream and **market adoption beyond the initial metal industry** processing stream source.

Cost Share Requirements

- At least 20% non-federal cost share required.
- Sources: internal capital, private loans, state/local programs.
- Not allowed cost share: Other federal funds, foregone profit, pre-award costs.
- Must provide written assurance & documentation.
- DOE reimburses 80% of eligible costs.

Cost Share Examples

	DOE Budget Share	Applicant Budget (20%)	Total Project Budget
Example 1	\$5M	\$1.25M	\$6.25M
Example 2	\$4M	\$1M	\$5M
Example 3	\$2.5M	\$0.625M	\$3.125M

Timeline

Open:	September 15, 2025
Strategic Session Webinar:	September 30, 2025
Office Hours (2 Options):	2 Options: Oct 14, 2025, and Nov 6, 2025
Submission Deadline:	November 20, 2025, at 3 PM
Phase 1:	~9 months
Phase 2:	~24 months

Questions & Answer



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No
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Thank You



Thank you for attending the TRACE-Ga OSS

- This recording, transcript and FAQ will be uploaded to the ENERGYWERX website
- If you have any additional questions, please email info@energywerx.org
- RSVP for the October 14, 2025, Office Hours Session
1 <https://energywerx.wufoo.com/forms/z1per9im1im621x/>



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