



# Critical Minerals Leadership Academy

## Building a Cross-Disciplinary Workforce for the Evolving Critical Minerals Sector

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2. ENTECH Strategies, LLC
3. National Energy Technology Laboratory (NETL)
4. NETL Support Contractor

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U.S. DEPARTMENT of ENERGY

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CRITICAL  
MINERALS  
LEADERSHIP ACADEMY

# Disclaimer



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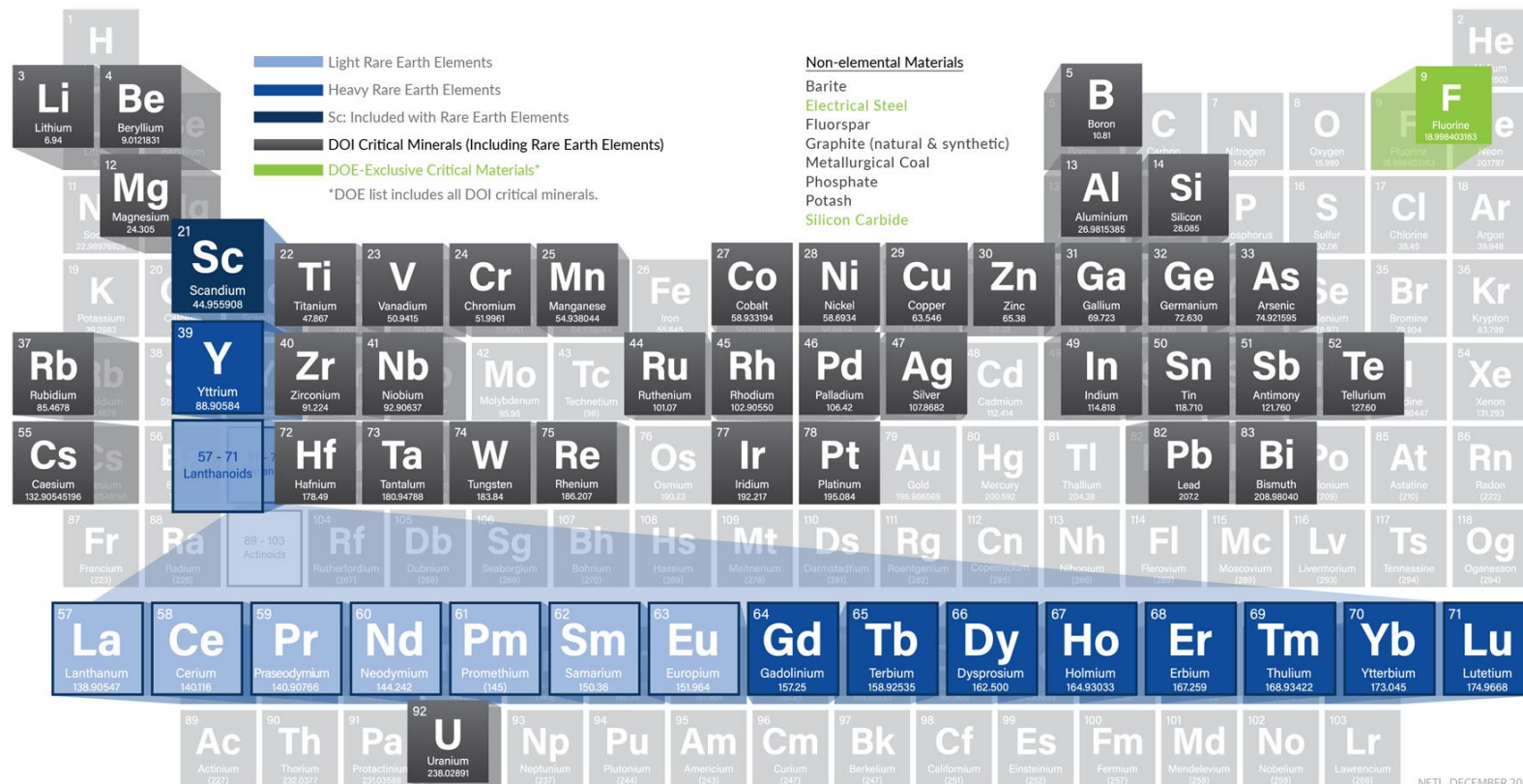


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# What are Critical Minerals & Materials



- **Critical minerals** were originally **defined in 2018 by USGS** under **Executive Order 13817**.
- The **2025 list includes 60 mineral commodities**. The **DOE** has also **designated several critical materials**.
  - United States consumption relies heavily on imports of these commodities; **many require >90% foreign sourcing**.
  - Supply chains considered vulnerable to adverse foreign government action, natural disasters, and other events.





## DOE Critical Minerals and Materials (CMM) Program

- Underlies METALLIC, CMI, CMC, and additional government-sponsored CMM R&D programs
- Guides U.S. CMM R&D by administering hundreds of millions of dollars in federal research funds to academia and industry
- Funds pilot- and demonstration-scale projects to validate laboratory innovations at industrially relevant scales
- Develops assessments, databases, and models to inform policy, identify resource potential, and guide investment in CMM recovery and processing



**METALLIC**

The Minerals to Materials  
Supply Chain Research Facility

- Consortium of 9 National Labs testing and scaling of new CMM technologies
- Focus areas: CMM feedstock production, extraction, refining, and end-use product manufacturing (e.g., superalloys)
- Emphasis on partnerships with academia and industry



### Critical Materials Innovation Hub

- DOE public-private partnership formed in 2013 and led by Ames National Lab with more than forty National Lab, industry, and academic participants
- Awards R&D funds, operates user R&D facilities, and trains future workforce
- Focus areas: enhancing and diversifying CMM supply, developing substitutes, unlocking secondary sources, crosscutting research



- “Innovation ecosystem” formed in 2023 to connect CMM R&D entities to industry operations for accelerated technology deployment
- Align and connect U.S. government agencies conducting CMM R&D (HGEO, CMEI, EERE, AMMTO, ARPA-E, MESOC, and more)

# Aging Workforce, Generational Gap

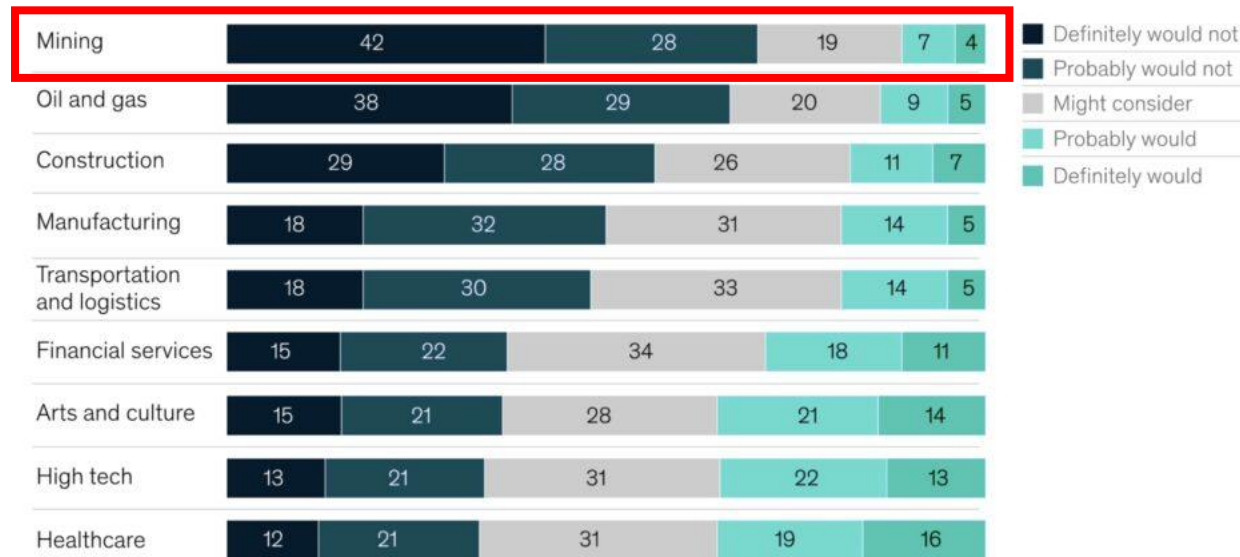


- Mining and geology workforce is aging—average age of miners is 46 years
- Long-term decline in enrollment in mining-related U.S. university courses has created a labor shortage
- Mining industry faces public distrust, lacks institutional knowledge from historic underinvestment

**The mining industry has the worst reputation among young people of all leading industries.**

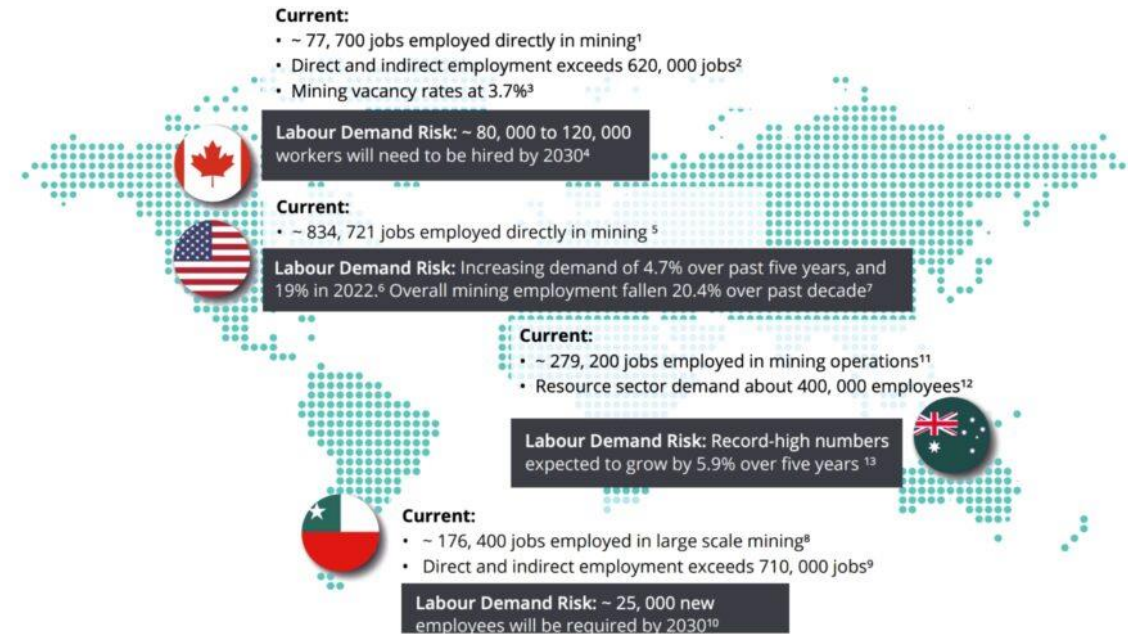
## Mining is not attractive to young talent

Share of respondents, ages 15 to 30, who would consider working in the following sectors, %



Note: Totals may not sum to 100, because of roundina  
Source: Mining Industry Human Resources Council 2020 Employer Survey, Mining Industry Human Resources Council, 2021: 15 Canadian mining companies representing more than 25,000 employees, participated in the survey, which was conducted during Dec 2020 and Jan 2021, McKinsey & Company

## Extent of skills shortage in key mining markets



Source: MIHR, "Interactive Labour Market Dashboard", Mining Industry Human Resources Council, Deloitte

# Conception of the Critical Minerals Leadership Academy (CMLA)



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# CMLA Sponsors and Partners



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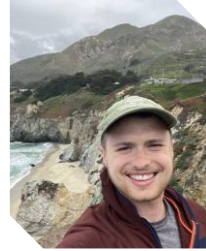
# The 2025 CMLA Cohort



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Alexis Meyers  
NREL  
Chemistry



Alex Taylor  
USGS  
Geology



Brody Loomis  
UT Austin  
Policy



Yasmine Adrian  
Georgetown  
Foreign Affairs



Eva Allen  
Argonne  
Materials Science



Gabriella Morales  
INL  
Engineering



Jason Yao  
Carnegie Mellon  
Engineering



Veronica Wilde  
Carbon Solutions LLC  
Public Engagement



Samuel Oswald  
Glencore  
Policy



Patty Weber  
WSGS  
Geology



Morgan Hill  
BLM  
Geology/Permitting



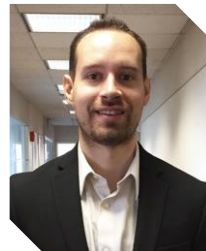
Amber Spears  
Tennessee State  
Engineering



Jacob Tidwell  
UC Boulder  
Geology



Katherine Gomes  
Carbon Direct  
Engineering



Alexander Specht  
Univ Wyoming  
Economics



Kalyn Tew  
Univ Alabama  
Geology/Policy



Sasha Levy  
Scripps  
Cybersecurity



Martha Newell  
Nat'l Mining Assoc  
Policy



Denise Levitan  
USGS  
Geology

# Faculty



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Erin  
Phillips



Pamela  
Tomski



Selena  
Gerace



Davin  
Bagdonas



Tyler  
Brown



Bob  
Gregory



Cole  
Messa



Franek  
Hasiuk



Fred  
McLaughlin



Scott  
Quillinan



Sallie  
Greenberg



Scott  
Montross



Tom  
Tarka



Charles  
Sims



Anna  
Wendt



# Faculty



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Richard  
Esposito



Madeleine  
J. Lewis



Nicole  
Smith



Denise  
Levitan



Elisa  
Alonso



Melissa  
Sanderson



Craig  
Hart



Morgan V.  
Evans



Paul  
Bonifas



Jaye  
Pickarts



Justin  
Loyka



Dave  
Green



Robert  
Seal



Tristan  
Childress



Madison  
Mankin





Nicole Smith lecture



Participant discussion

Cohort at the UW SER 3D Visualization Center



Day hike



# RER

RARE ELEMENT RESOURCES

Group site visit to  
Rare Element  
Resources,  
Sundance, WY



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# Dry Fork Mine

WESTERN FUELS-WYOMING, INC.



Group site visit to  
Dry Fork Mine,  
Gillette, WY



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# DEVIL'S TOWER WYOMING



Group hike; dinner at  
Campstool Ranch with  
Wyoming Legislators



## Critical Minerals Leadership Academy Highlights

CMLA is a **game-changer** for early-career professionals in the critical minerals space. In just one week, it unlocked insights you won't find in any textbook, put my career into sharper focus, and connected me with a powerhouse network across the industry.

- Katherine V. Gomes

CMLA was an **incredible experience** thanks to the School of Energy Resources team and the program's thought leaders and planners.

- Veronica Wilde

The CMLA was a fantastic experience that **left me energized in my career and excited for the future of critical minerals....** Meeting so many other smart and passionate early career professionals was inspiring and also **a lot of fun!**

- Alexander Taylor

**Critical Minerals and  
Materials Program  
Department of Energy**



[www.NETL.DOE.gov](http://www.NETL.DOE.gov)



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**Critical Minerals  
Leadership Academy  
University of Wyoming**



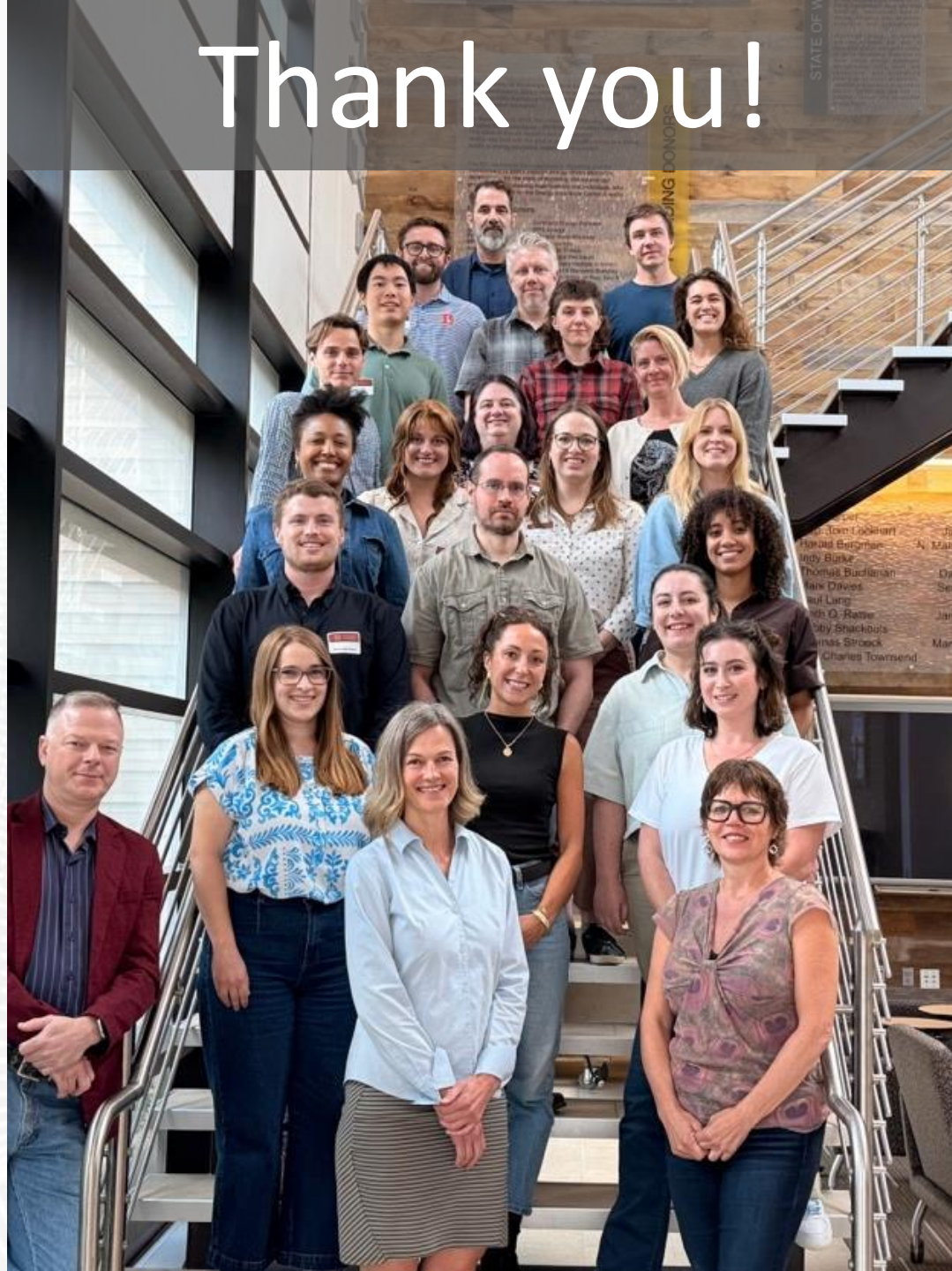
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**@uwschoolofenergyresources**

**@uwenergy**

# Thank you!



# Itinerary



## Sunday

- Cohort Travels to Laramie

## Monday

- Welcome
- Strengths of the Cohort
- Big Picture  
Relevance China's Strategy
- Economics
- Supply Chains
- Decision Making  
Lightning Talks
- Welcome Reception

## Tuesday

- Geologic Resource Assessment
- USGS Programs
- WY Case Studies  
Geothermal Lithium
- Industry Perspectives
- Mine of the Future
- DOE Demonstrations  
Separation/Extraction
- Standardization
- Waste Streams

## Wednesday

- Crit. Minerals Leadership
- Place-based Relevance
- Social License
- Tribal Opportunities  
Landscapes/Communities
- Recycling/Circular  
Economies  
Policy/Permitting
- Lightning Talks
- Project Work

## Thursday

- Depart Laramie
- Visit Rare Element Resources Bear Lodge Project in Sundance

## Friday

- Dry Fork Mine Tour and Workshop on Unconventional Critical Minerals
- Optional Hike at Devil's Tower
- Dinner at Campstool Ranch with Wyoming Legislators

## Saturday

- Gillette College Tech Center Visit
- Workforce Development
- Group Presentations
- Concluding Discussion
- BBQ at Washington Park, Laramie

## Sunday

- Cohort Departs Laramie