BRINGING ALASKA'S CORE-CM POTENTIAL INTO PERSPECTIVE

HB 177: Critical Natural Minerals Plan And Report

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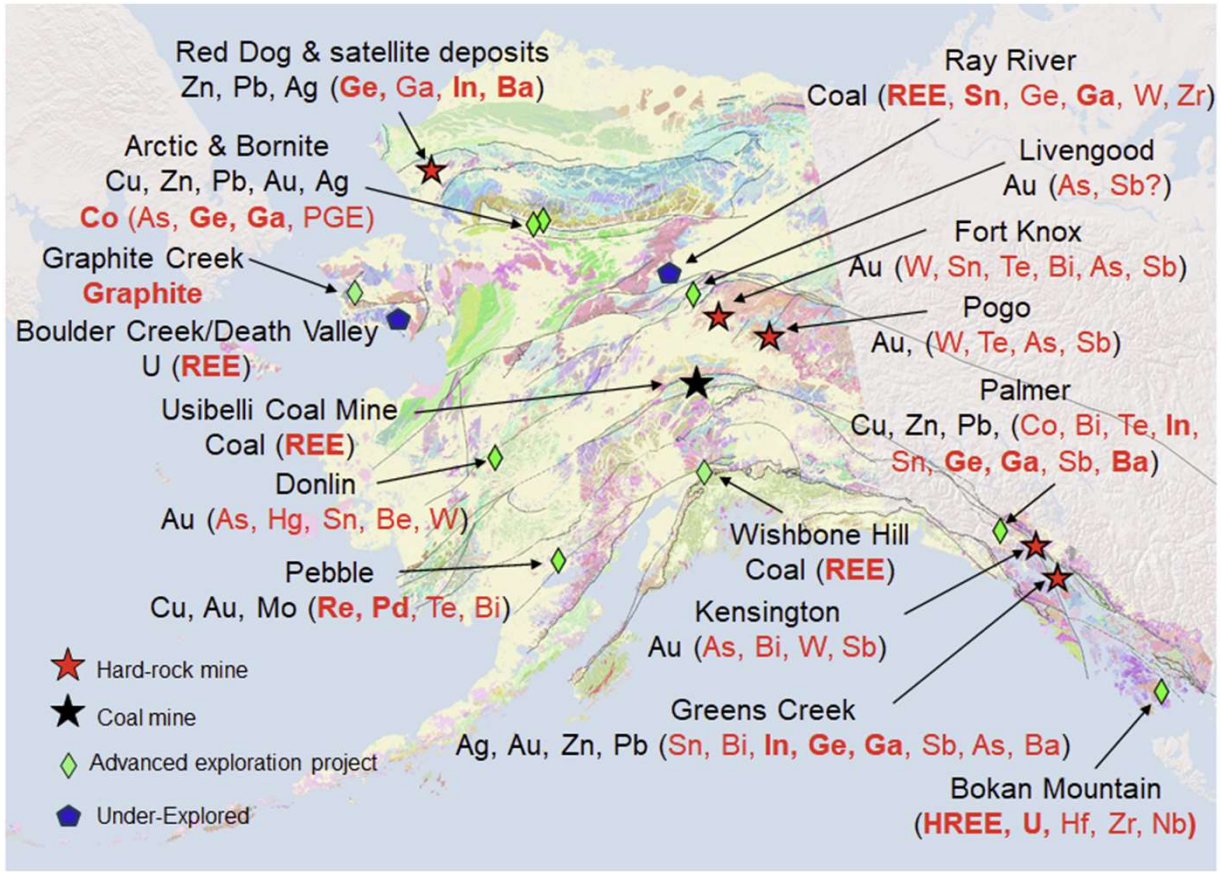
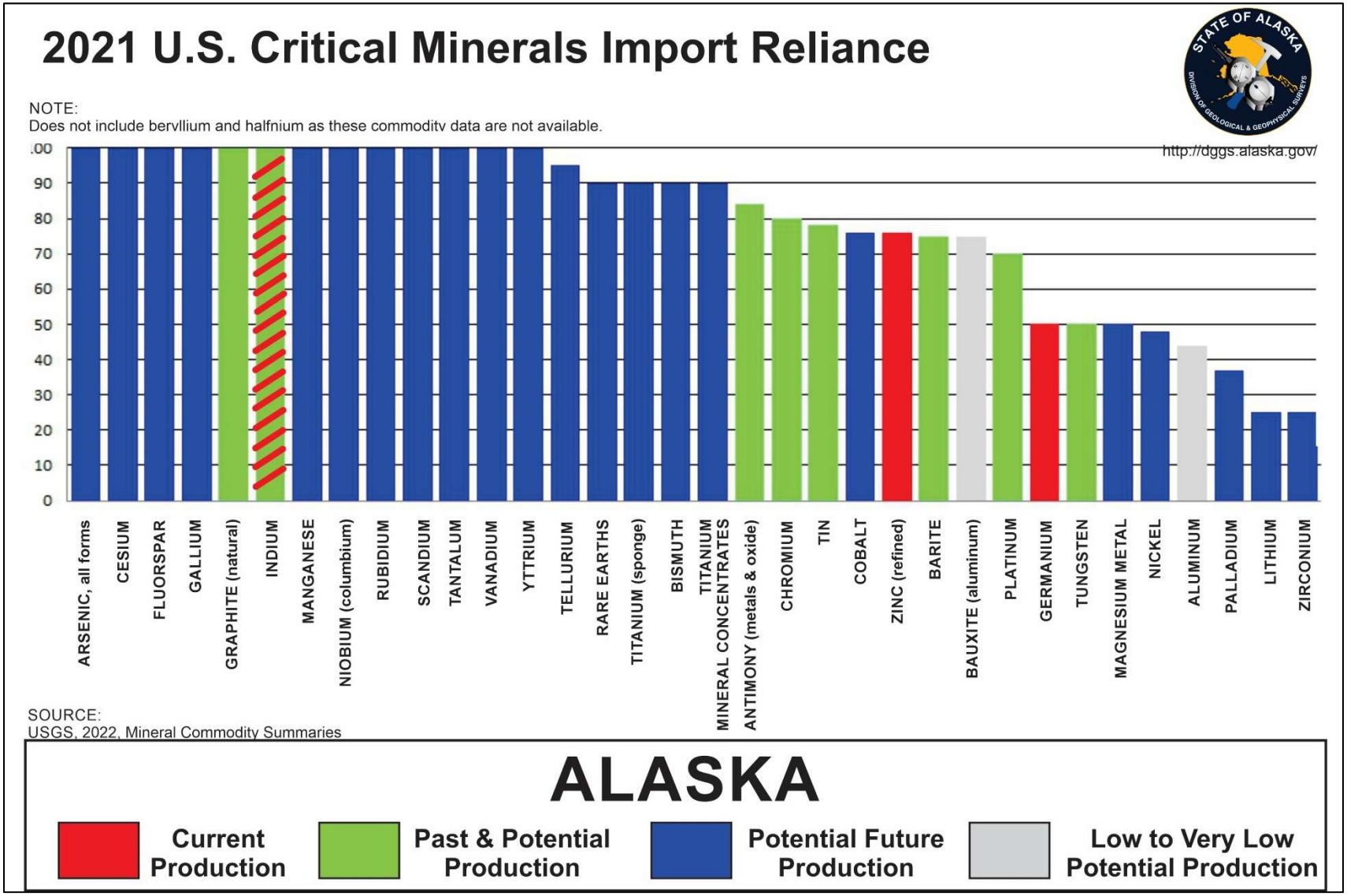
MINERAL RESOURCES



- AK's current mines and advanced mineral exploration projects
- Potential CM in red
- CM in bold font is the most abundant CM, with current data, at the respective property

BACKGROUND—ALASKA'S CRITICAL MINERAL POTENTIAL



APPLICATIONS/PRODUCTS

MAGNETICS

Computer Hard Drives
Disk Drive Motors
Anti-Lock Brakes
Automotive Parts
Frictionless Bearings
Magnetic Refrigeration
Microwave Power Tubes
Power Generation
Microphones & Speakers
Communication Systems
MRI

Nd Tb Dy Pr

METAL ALLOYS

NiMH Batteries
Fuel Cells
Steel
Super Alloys
Aluminum/Magnesium

Nd Y La Ce Pr

DEFENSE

Satellite Communications
Guidance Systems
Aircarft Structures
Fly-by-Wire
Smart Missiles

Nd Eu Tb Dy Y Lu Sm Pr La

CATALYSTS

Petroleum Refining
Catalytic Converter
Fuel Additives
Chemical Processing
Air Pollution Controls

Nd La Ce Pr

GLASS & POLISHING

Polishing Compounds
Pigments & Coatings
UV Resistant Glass
Photo-Optical Glass
X-Ray Imaging

Nd Gd Er Ho La Ce Pr

CERAMICS

Capacitors
Sensors
Colorants
Scintillators
Refractories

Nd Y Eu Dy Lu Gd La Ce Pr

PHOSPHORS

Display phosphors-
CRT,LPD,LCD
Fluorescents
Medical Imaging
Lasers
Fiber Optics

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Courtesy of DOE

CARBON ORE, RARE EARTH, & CRITICAL MINERALS

Vision: Bring Alaska's CORE-CM potential into perspective

Mission: Establish a CORE-CM industry in Alaska by working with industry and other stakeholders to ID opportunities & address challenges

BUDGET BY PHASE

Phase	Period of Performance	Period	DOE Share	Cost Share	Total Budget
Phase 1	2 yrs	Sep 2021 - June 2024	$2M	$0.51M	$2.5M
Phase 2	3 yrs	July 2024 - Feb 2026	$7.5M	$1.87M	$9.37M
Phase 3	5 yrs	Feb 2026 - Feb 2030	$10M	$2.5M	$12.5M
Total	10 yrs		$19.5M	$4.88M	$24.38M

OVERVIEW

NETL Objective from the FOA		UAF/DGGS Task Equivalent
1. Basinal Assessment of CORE-CM Resources	=	Task 2: Basinal Assessments
2. Basinal Strategies for Reuse of Waste Streams	=	Task 3: Waste Stream Reuse
3. Basinal Strategies for Infrastructure, Industries and Businesses	=	Task 4: Strategies for Infrastructure, Industries and Businesses
4. Technology Assessment, Development and Field Testing	=	Task 5: Technology Assessment, Development and Field Testing
5. Technology Innovation Centers	=	Task 6: AK-TIC
6. Stakeholder Outreach and Education	=	Task 7: Stakeholder Outreach & Education

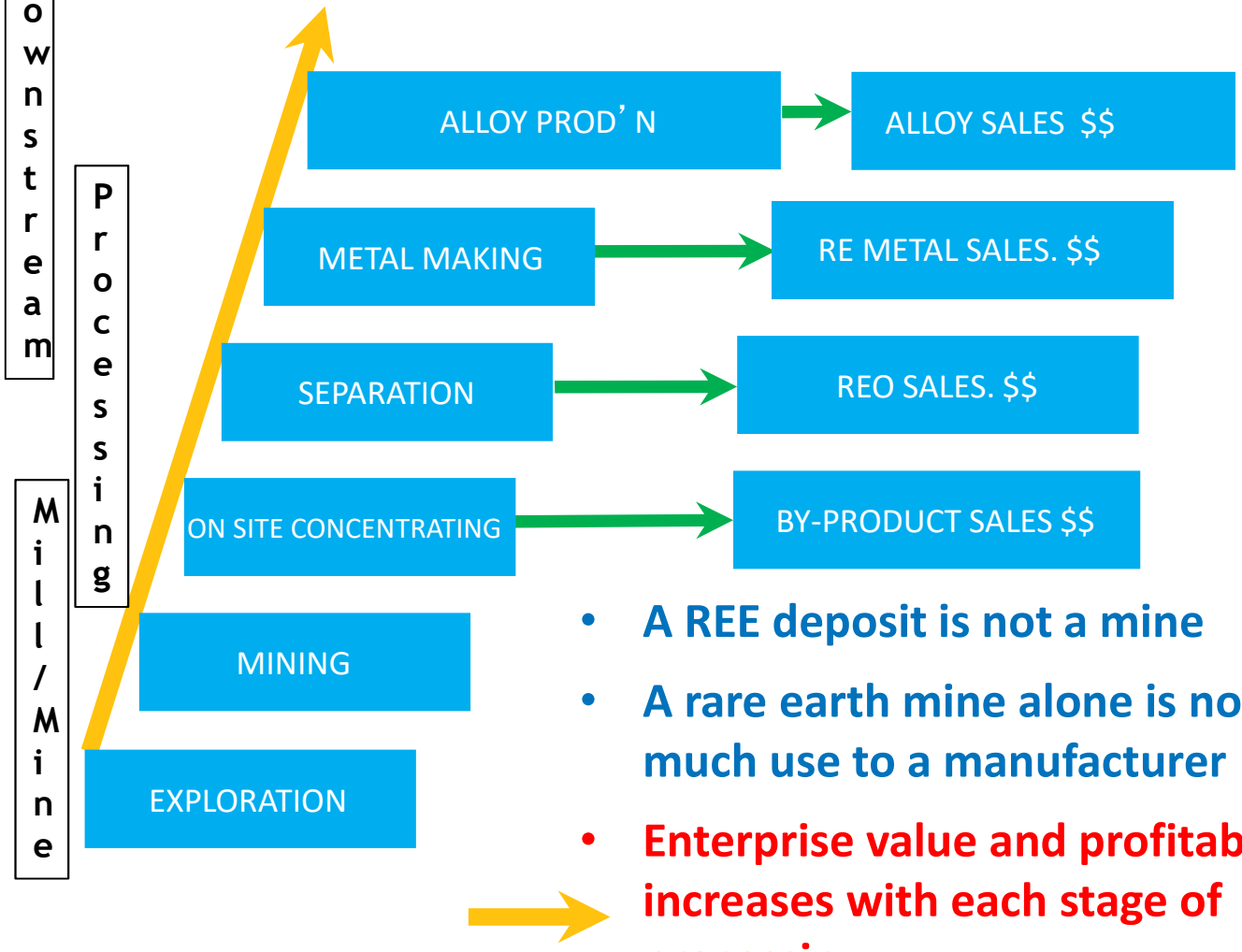
REE VALUE CHAIN

Where does a particular business fit into the value chain?

Downstream

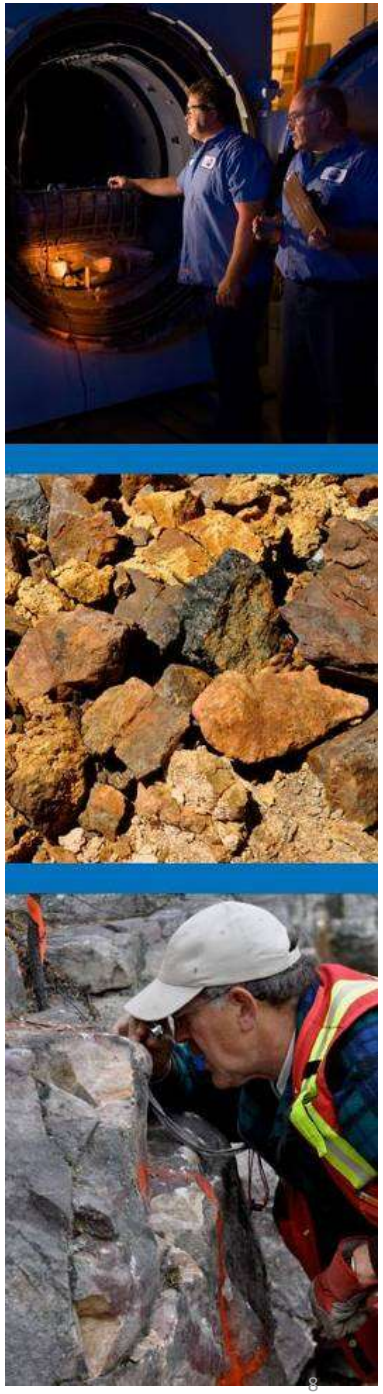
Processing

Mill/Mine



- **A REE deposit is not a mine**
- **A rare earth mine alone is not of much use to a manufacturer**
- **Enterprise value and profitability increases with each stage of processing**

Graphic Courtesy of Great Western Minerals Group, Ltd, Jack Lifton
Technology Metals Research, LLC (after ESP Research)



ADDITIONAL ASSETS

- UAF INE: Installing an ICP-MS
- UAF GI: Operates a hyperspectral imaging facility in the state
- UAF GI: Advanced instrumentation Laboratory
- UAA is developing bioreactors to separate elements from ores without the use of acids
- UAS and UAF are expanding their respective efforts to provide mine training

THANK YOU

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