Copper Development Association Inc.

Copper Age 2.0 in America

Legal Disclaimer

The purpose of this presentation is to guide programs benefiting the copper industry and to provide attendees with information to make independent business decisions

Introduction

Marcus Elmer
Copper Development Association
Vice President

MARKET INTELLIGENCE

ADVOCACY

CODES & STANDARDS

Cu Copper Development Association Inc.

MARKET SUPPORT

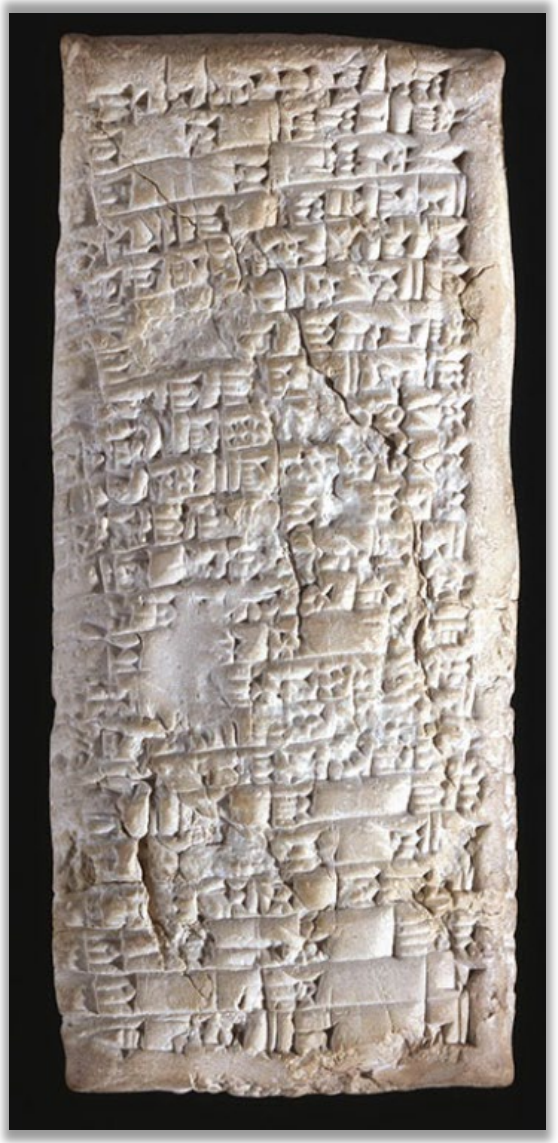
INDUSTRY NEWS & UPDATES

EVENTS & NETWORKING

Cu

The Enduring Importance of Copper

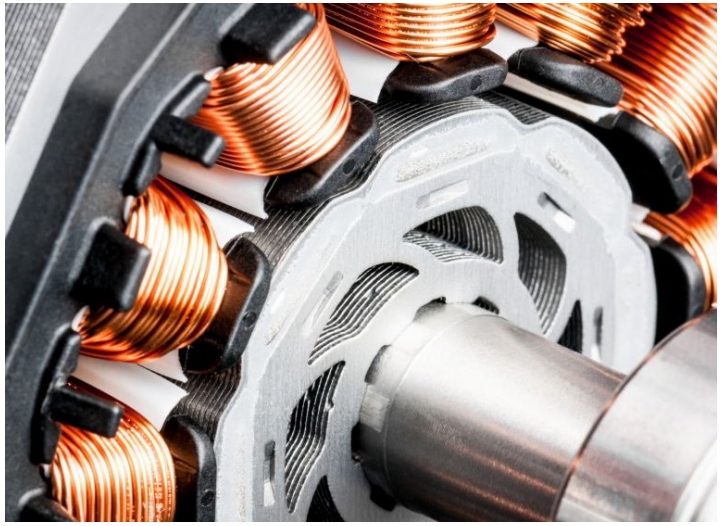
- Guinness World Record: Tablet to Ea-nasir is the **oldest recorded customer complaint**
- Currently resides in the British Museum
- 3,700+ years old
- **Customer service and issues with the wrong grade of copper being delivered**

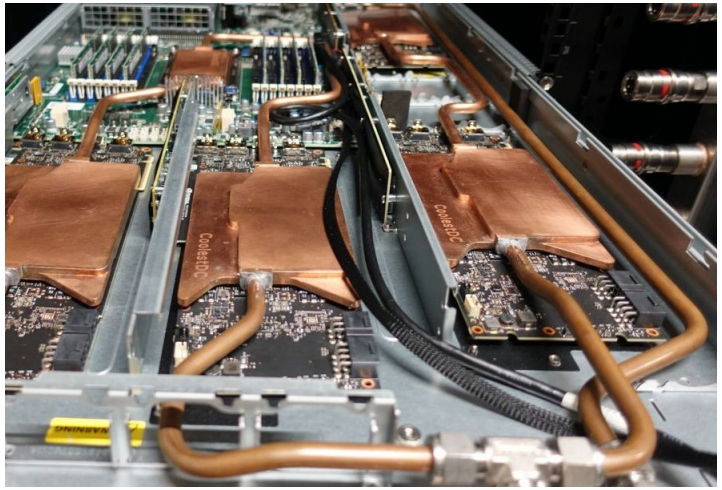


Oldest written customer complaint | Guinness World Records


Welcome to
Copper Age
2.0
Cu
Copper Development
Association Inc.

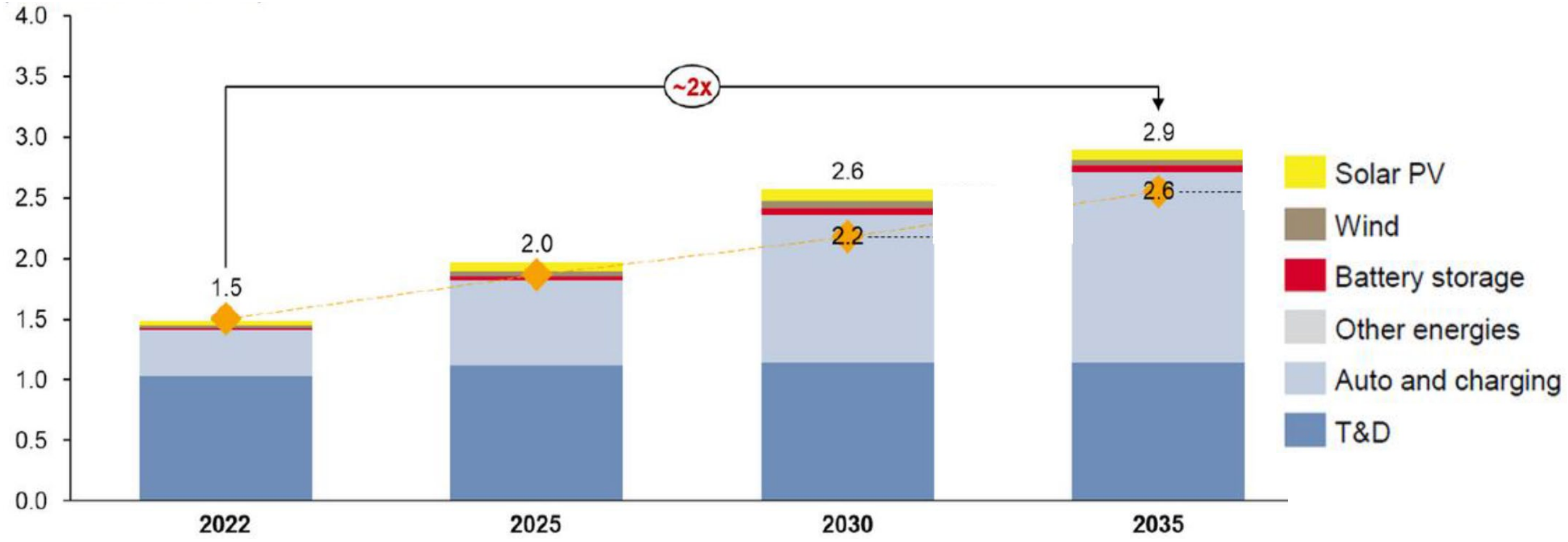
Copper & the U.S. copper industry are critical to America's policy goals





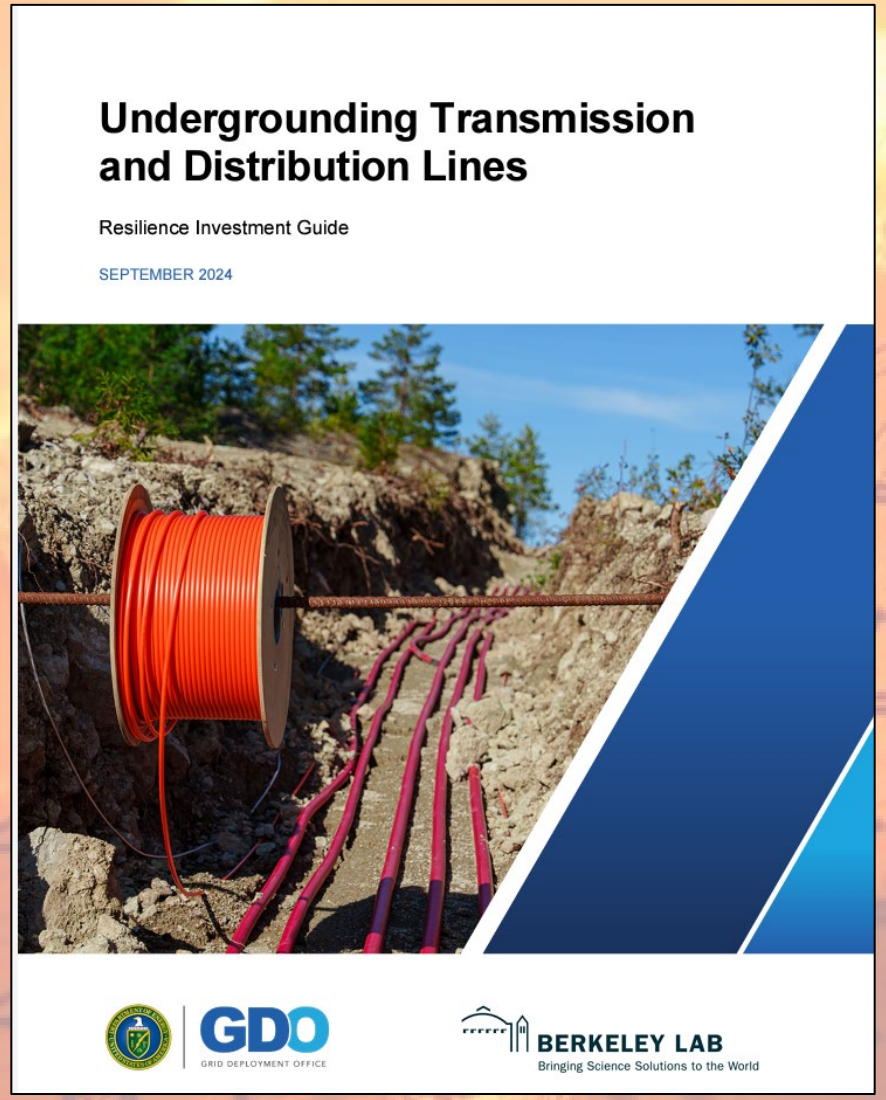
U.S. copper demand is projected to double by 2035, fueled by data centers, grid expansion/hardening, national energy strategy, defense, infrastructure & EVs

Million metric tons



Cu Source: S&P Global, 2024

Overhead aluminum transmission lines dominate the U.S., but climate disasters and grid upgrades present big opportunities for copper

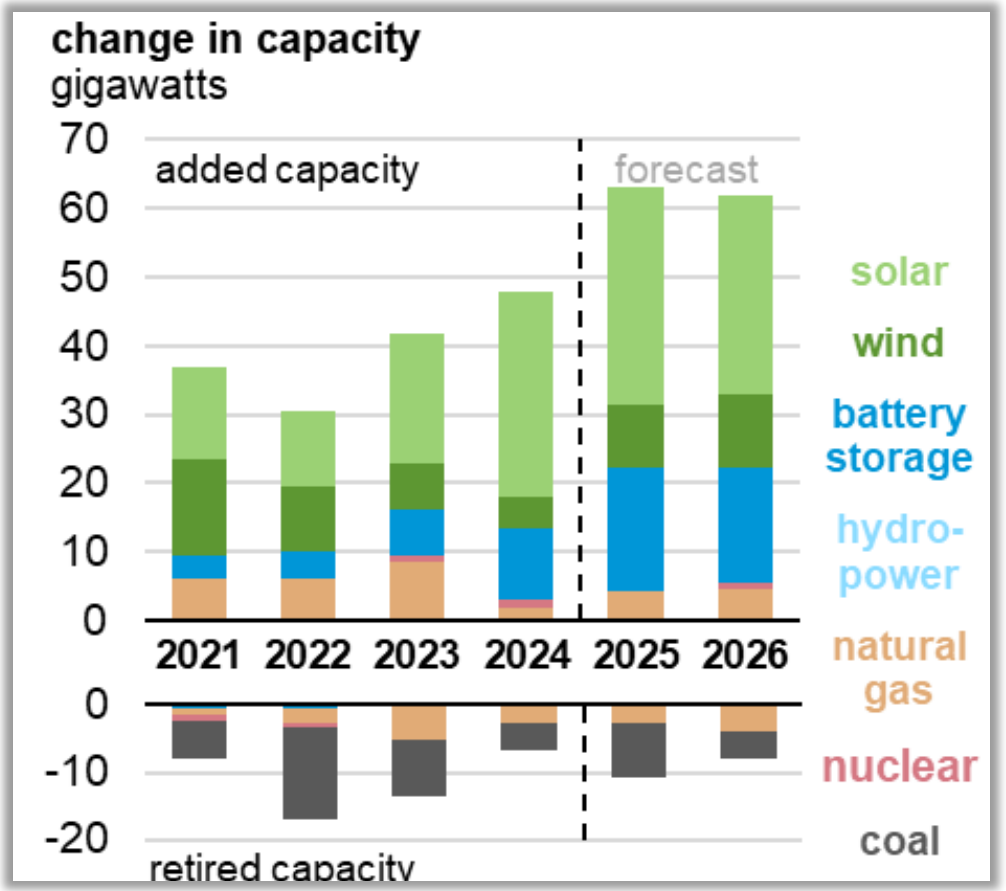


Transmission & Distribution (T&D) Cable Market

Key Factor: Increasing Energy Demand / Generation

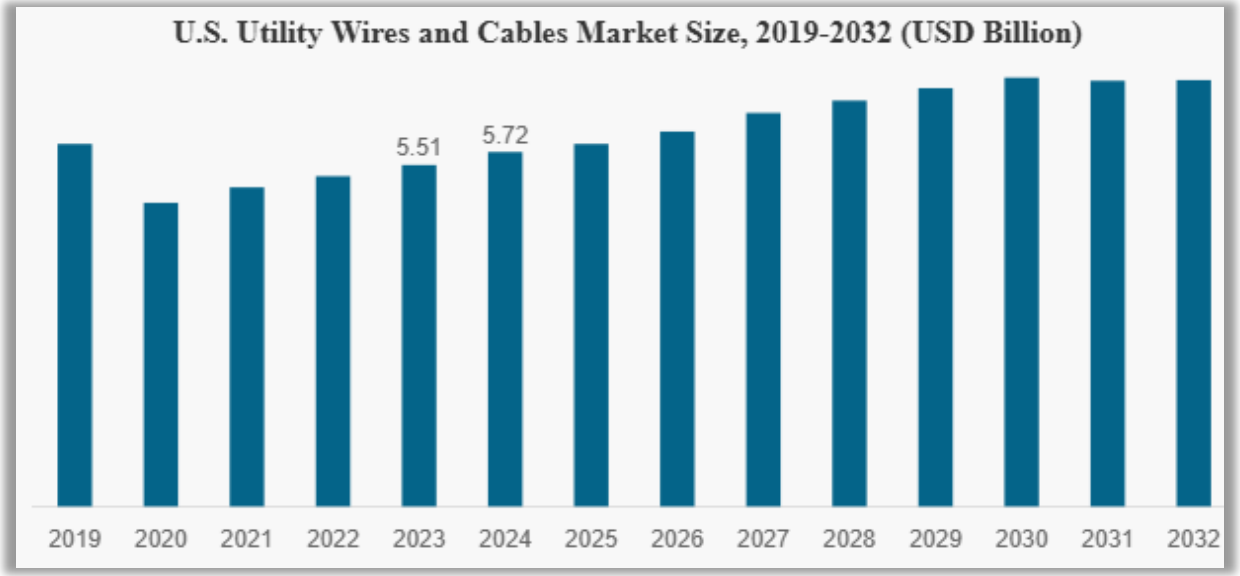
- The Energy Information Administration (division of DOE) increased their forecast of 3% growth in energy consumption
- Data from power plant developers indicates plans to add 32 GW of solar in 2025 compared to 30 GW in 2024, a 33% increase in solar generation
- A 35 GW increase in battery storage capacity is expected over the next 2 years

NOTE: 1 GW can power over 750,000 homes.



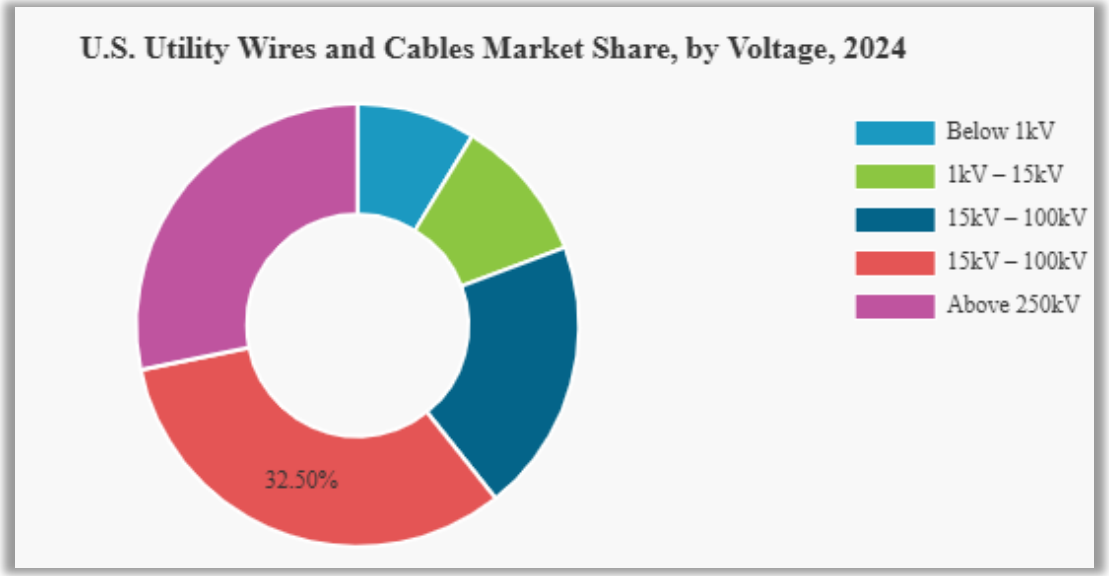
Source: U.S. Energy Information Administration, *Short Term Energy Outlook*, March 2025

Transmission & Distribution (T&D) Cable Market



Source: Fortune Business Insights

The U.S. utility wires and cables market was worth $5.72 billion in 2024 and is projected to grow at a CAGR of 3.2% through 2032.



Source: Fortune Business Insights

Might and medium voltage power cables represent the largest and fastest growing segments of the utility cable market.

Underground Power Cable

Growth Drivers

- Catastrophic Weather Events
- Wildfires
- Need for Increased Reliability (Datacenters, Healthcare Centers, etc.)
- Aesthetics

Copper Advantages in Undergrounding:

- High conductivity allows smaller gauges, minimum space requirement, lower boring costs
- Low expansion maintains cable integrity inside conduit
- High efficiency saves energy and costs over life of the system

Underground Power Cable Projects

Coastal Virginia Offshore Wind (CVOW) with 10 horizontal directional drills.

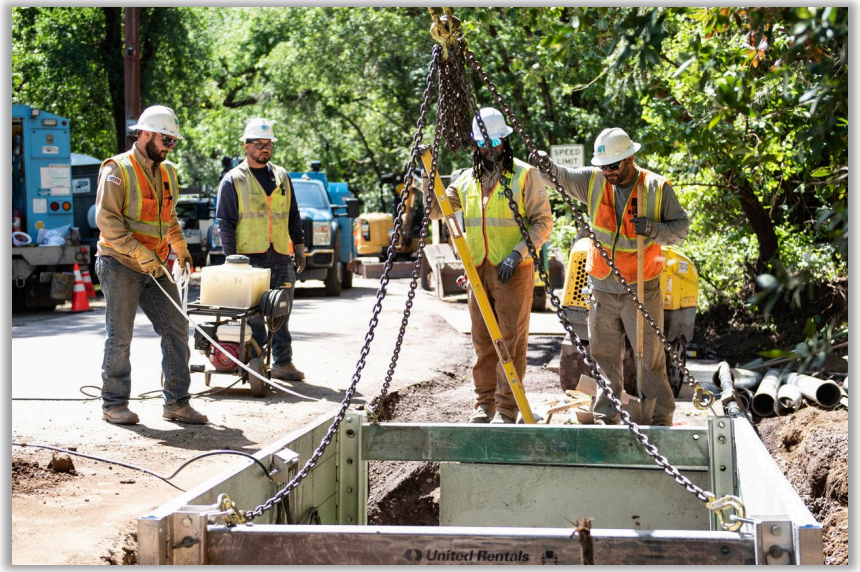
Pacific Gas & Electric (PG&E) is installing 10,000 miles of underground transmission lines.

Underground Power Cable Market

Current Market

- 54,000 tonnes copper (2025)
- Transmission lines (high voltage):
  - 0.5% to be underground
- Distribution lines (medium voltage):
  - 18% in 2009 to an estimated 20% in 2023.

  The percentage is expected to increase.



Opportunities

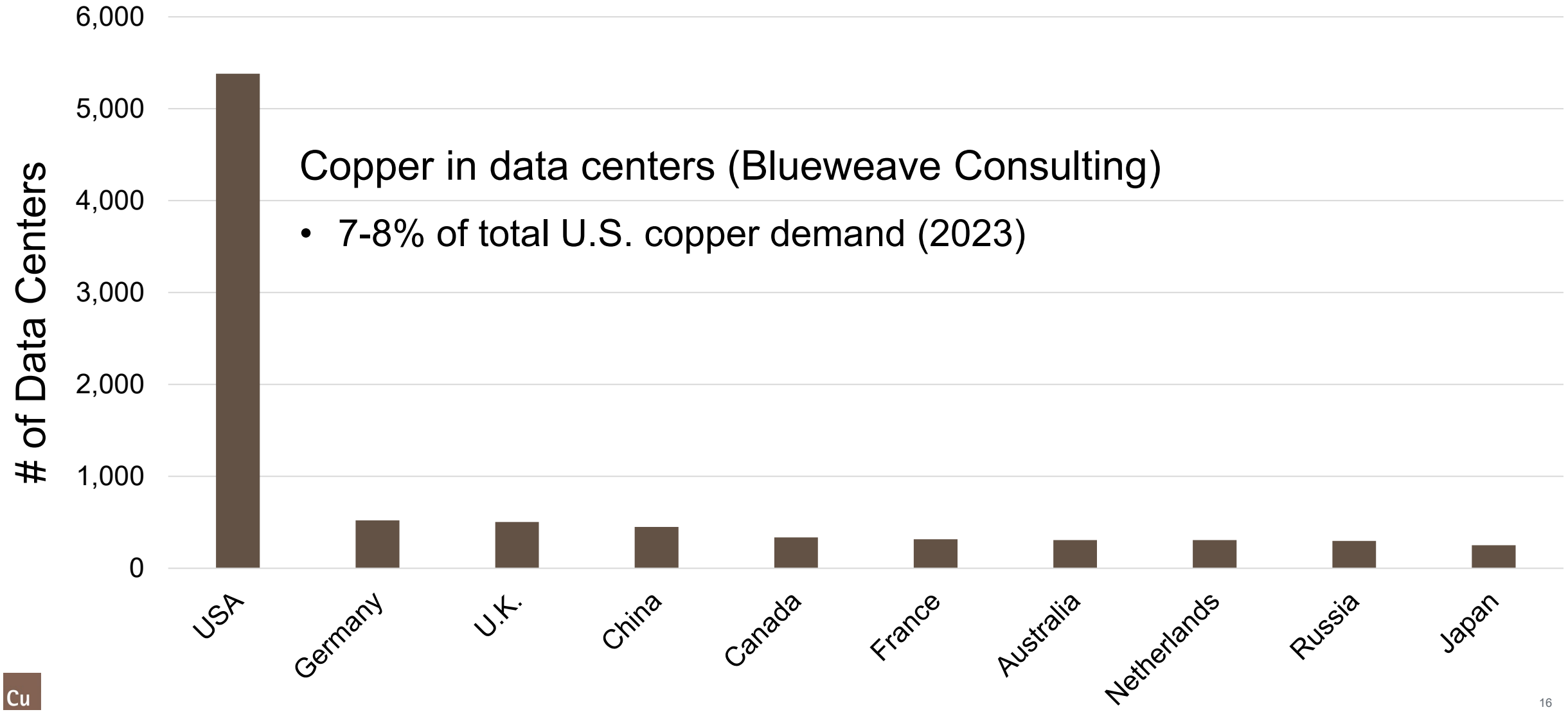
- Increased utility spending on underground T&D lines.
- Replacement of dated, fluid-filled lines with less expensive cross-linked polyethylene (XLPE) cables
- Replacement of paper-insulated lead-covered (PILC) cables.

Data Centers may consume close to 10% of global electricity by 2030 and more than 10% of global demand for copper by 2035

Source: Siemens

U.S. leadership in data centers

(CloudScene, U.S. Global Investors, March 2024)



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Copper Use in the Data Center

50-100 tons of copper per megawatt (MW)

Power — **70-75% copper**

1. Busbars and power distribution cable
2. Transformer

Cooling — **3-10% copper**

1. Air cooled
   a) Chillers (compressor/motor)
   b) Motor for fans
   c) Piping
2. Liquid Cooled
   a) Cold plate
   b) Heat exchangers
   c) Piping

Server and Switch — **1-2% copper**

1. Copper Ethernet cables
2. Power distributions cables & (in-server) busbars
3. PCB & connectors

Grounding — **10-20% copper**

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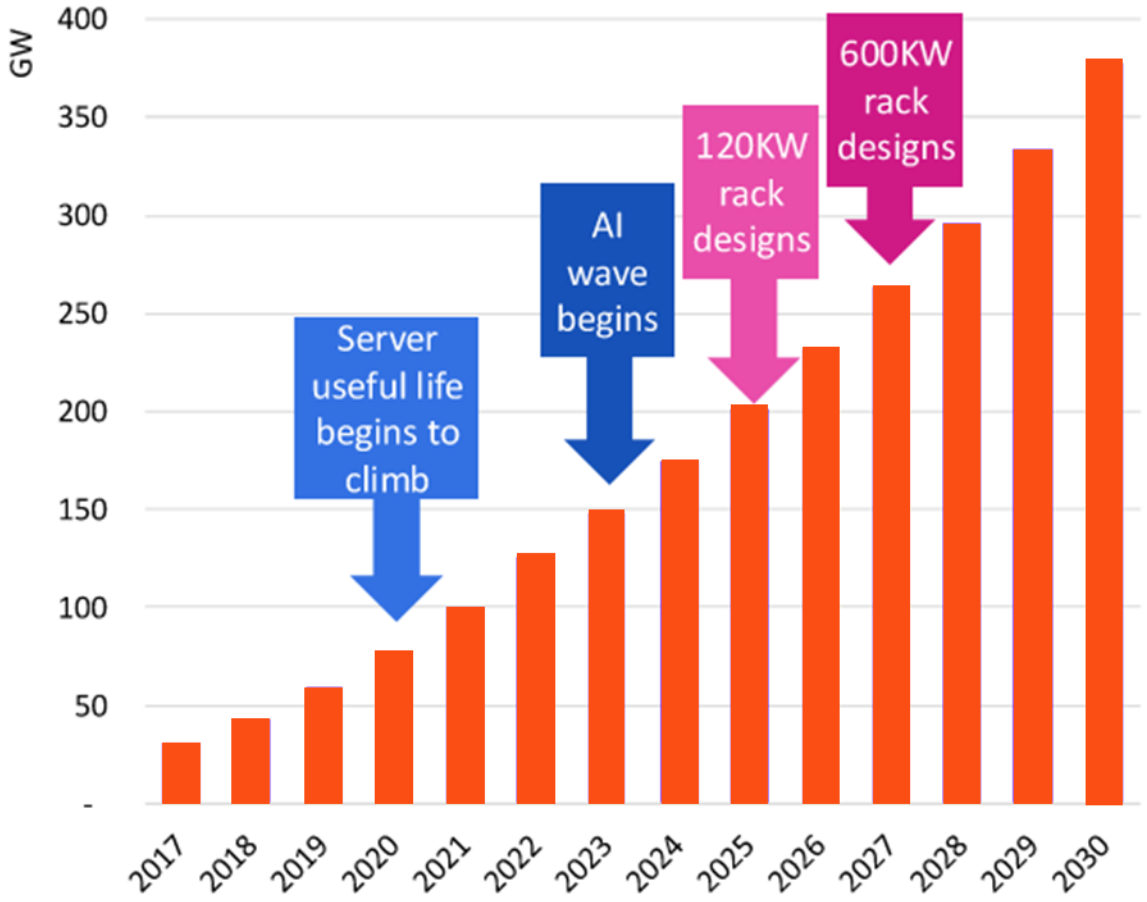
Data center power capacity: 0.5 terawatt is in line of sight

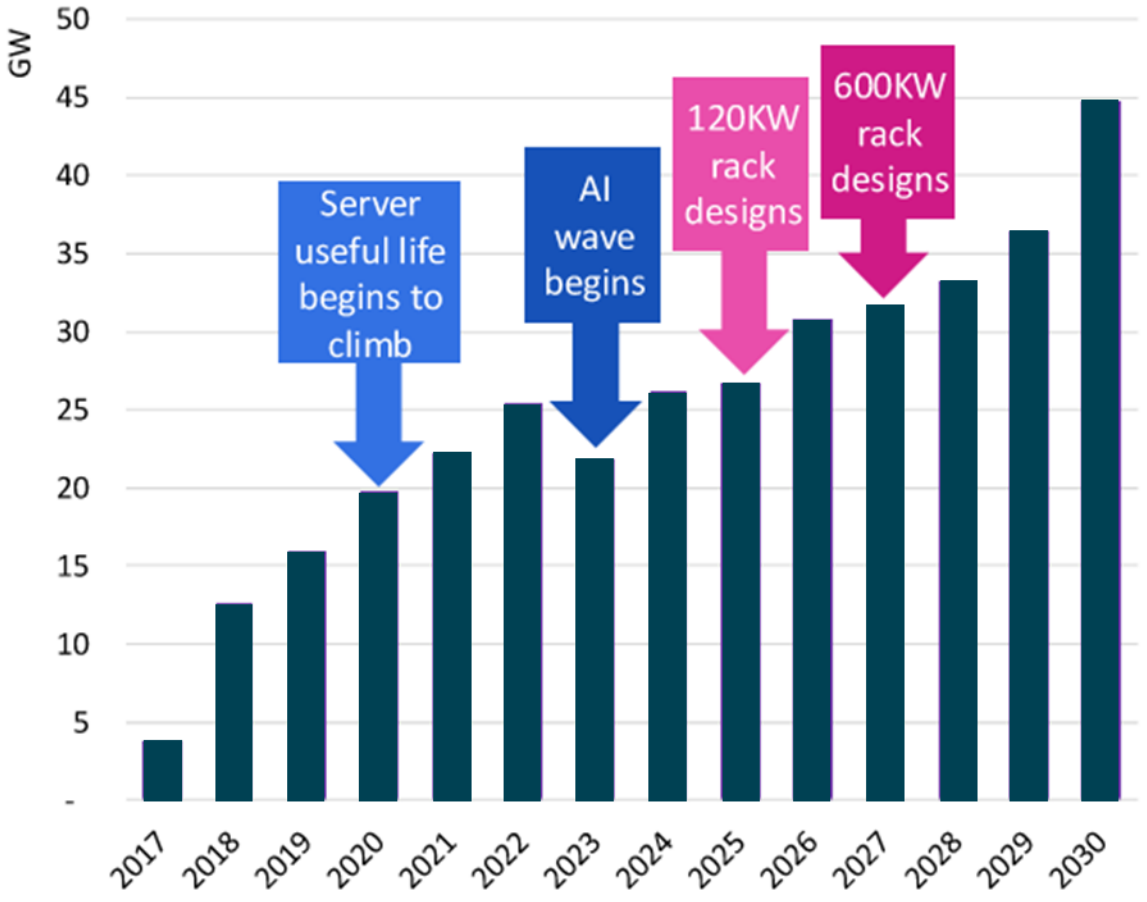
Cumulative

Installed data center power capacity in MW



Change by year

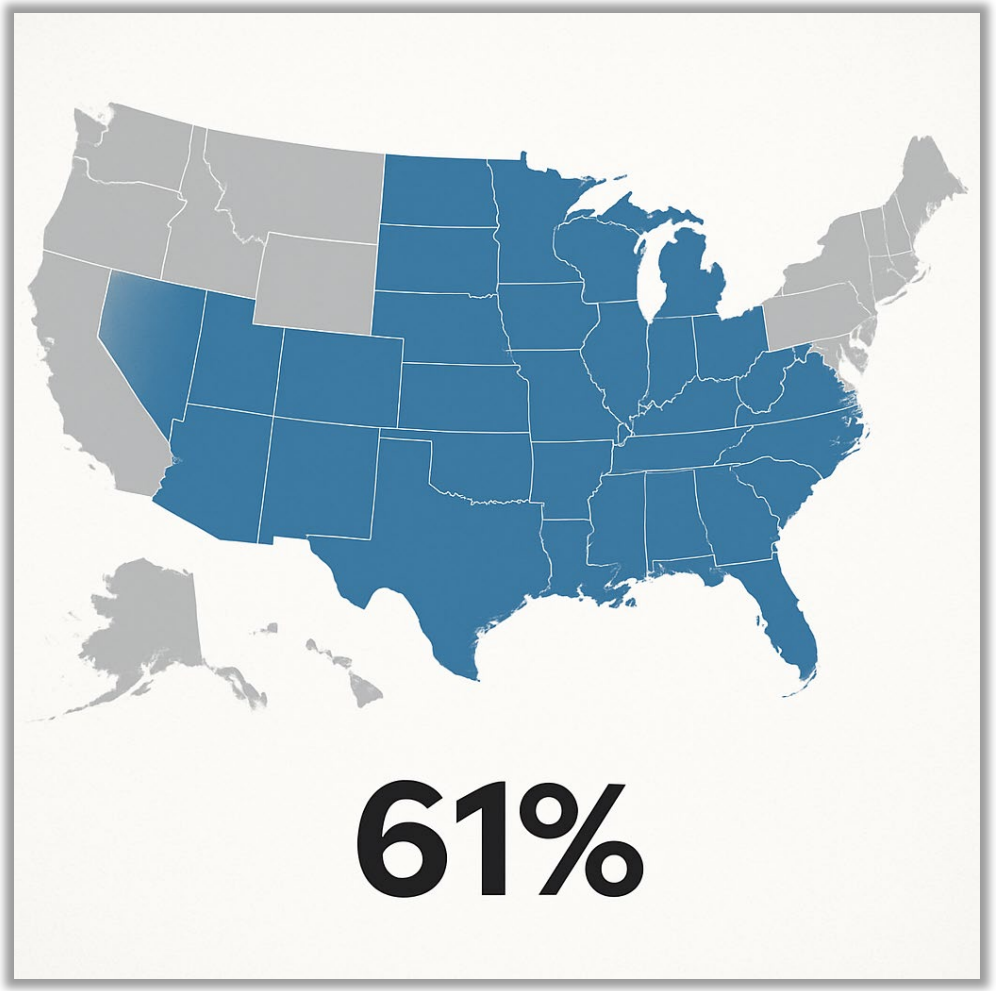
New data center installations in MW



Source: Omdia

How much is 0.5 terawatt?

- 61% of homes in the US for an hour (50 million single-family homes)
- The entire state of California for about 5 days
- 2 billion miles in an EV (to Pluto and back three times)
- Fully charge 50 billion iPhones (6x the world's population



Source: Making Sense of Energy Units – Sustainable Choice

Stargate Project: estimated *(conservative)* copper demand

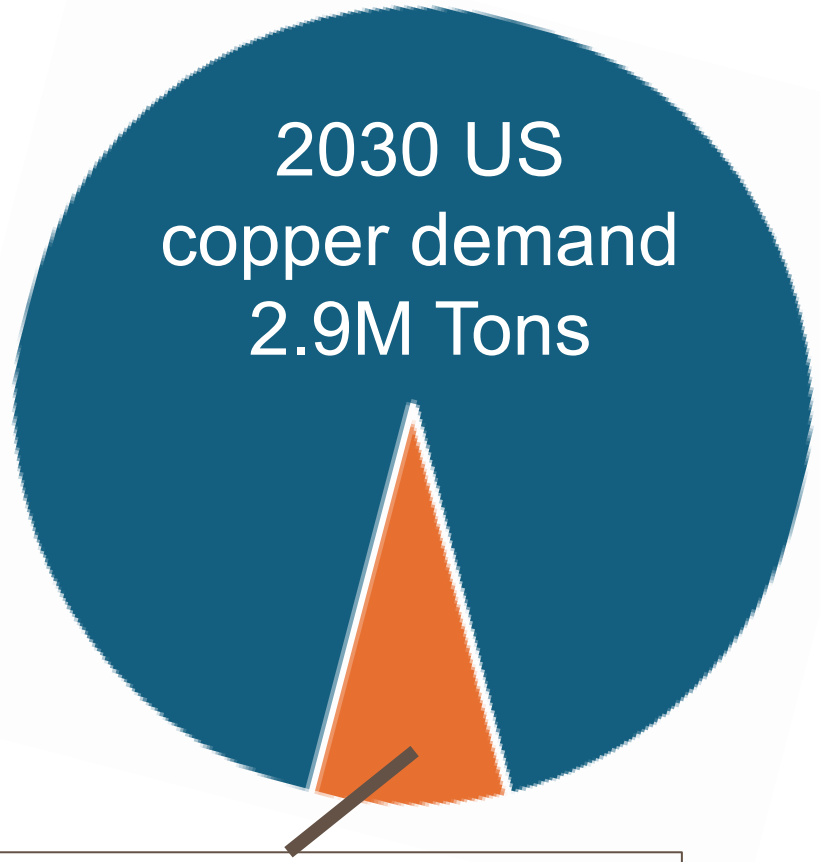
- Estimated around 20 centers (#1 underway in Abilene, TX)
  - 5-15 GW of power across all it's locations

5,000 MW

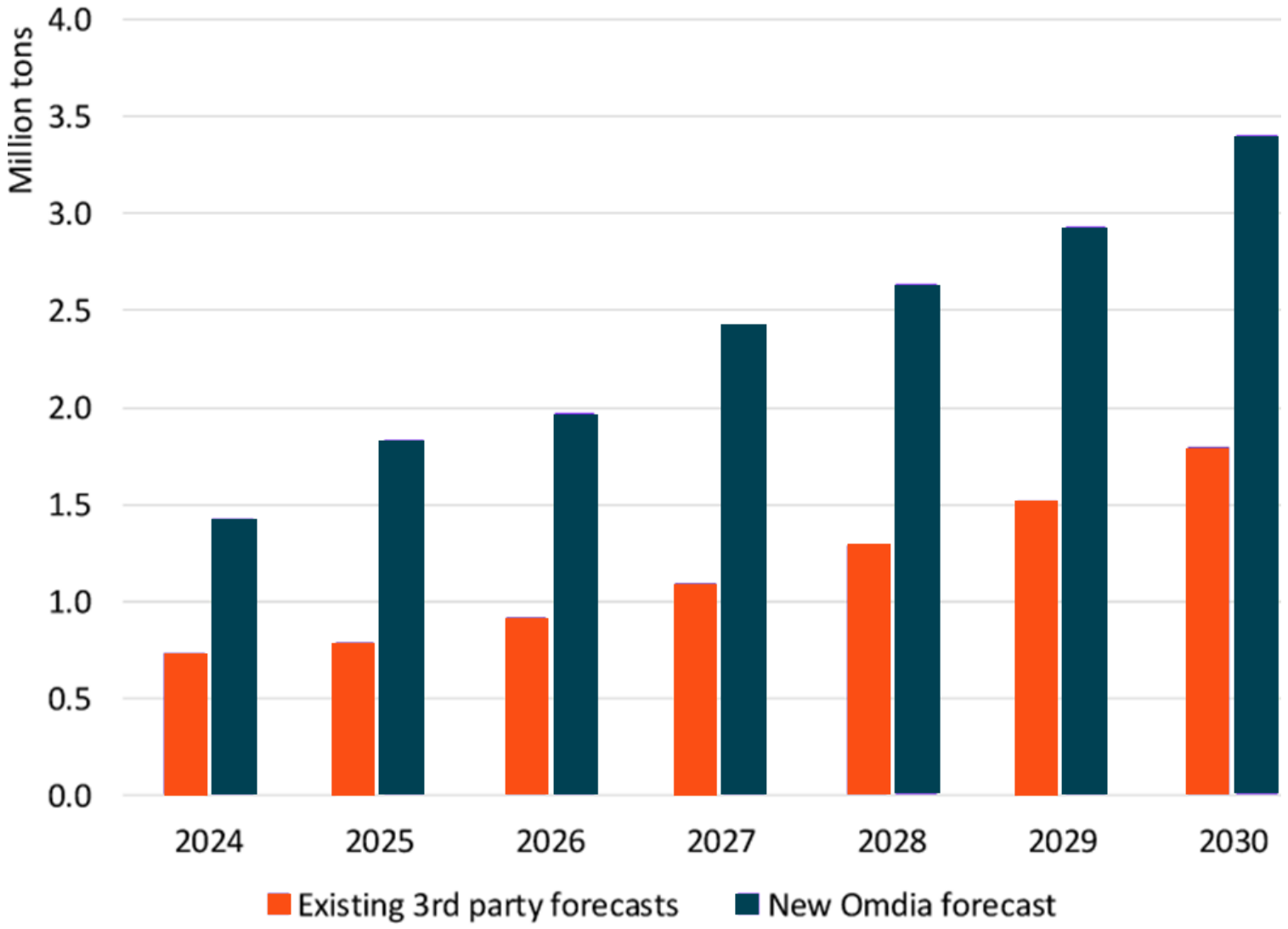
x50 tons Cu/MW

=250,000 tons Cu

=9% of Cu demand 2030

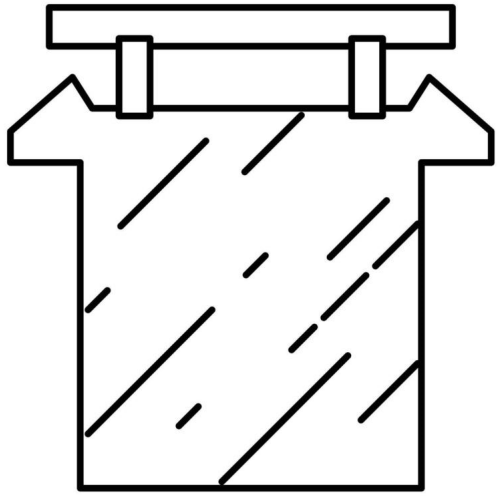


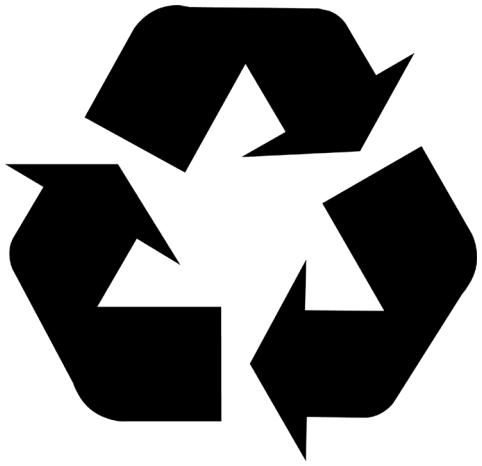
Data Center Copper Demand

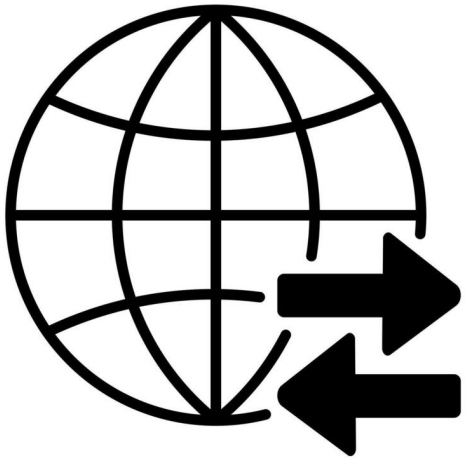


Source: Omdia

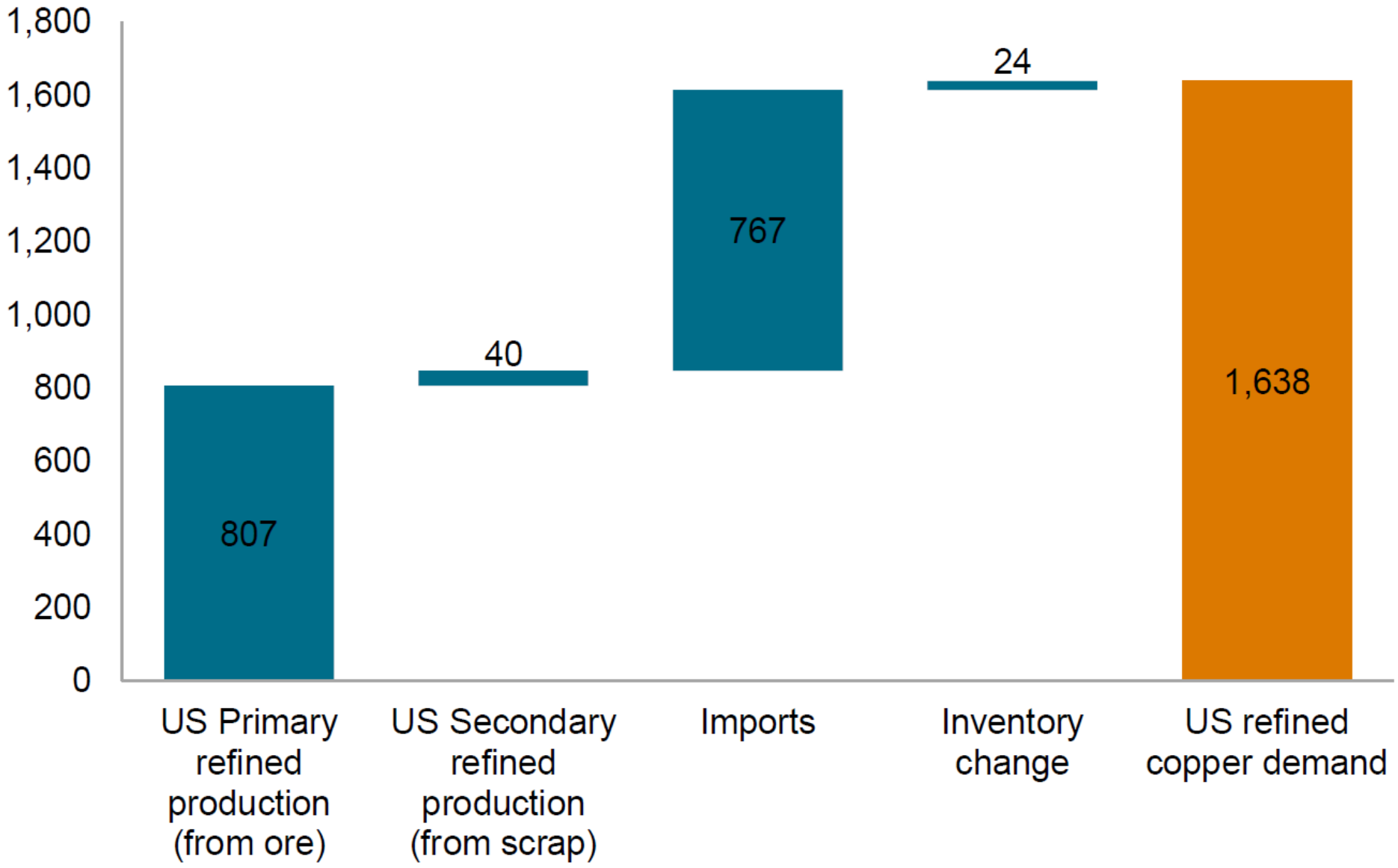
U.S. will need an ‘all-of-the-above’ copper sourcing strategy to meet the projected doubling of demand by 2035







High import reliance on refined copper
(S&P Global, U.S. Refined Supply & Demand)



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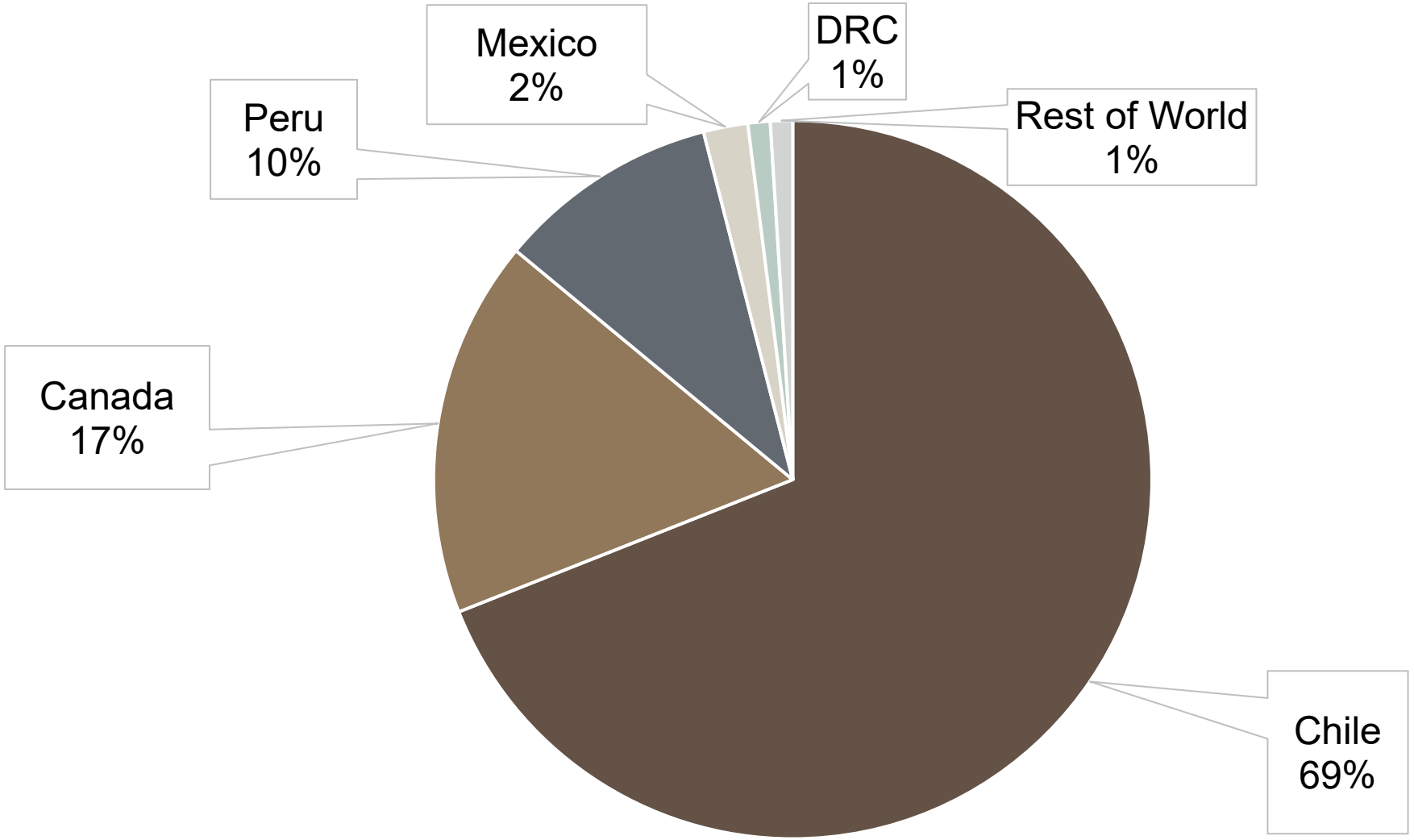

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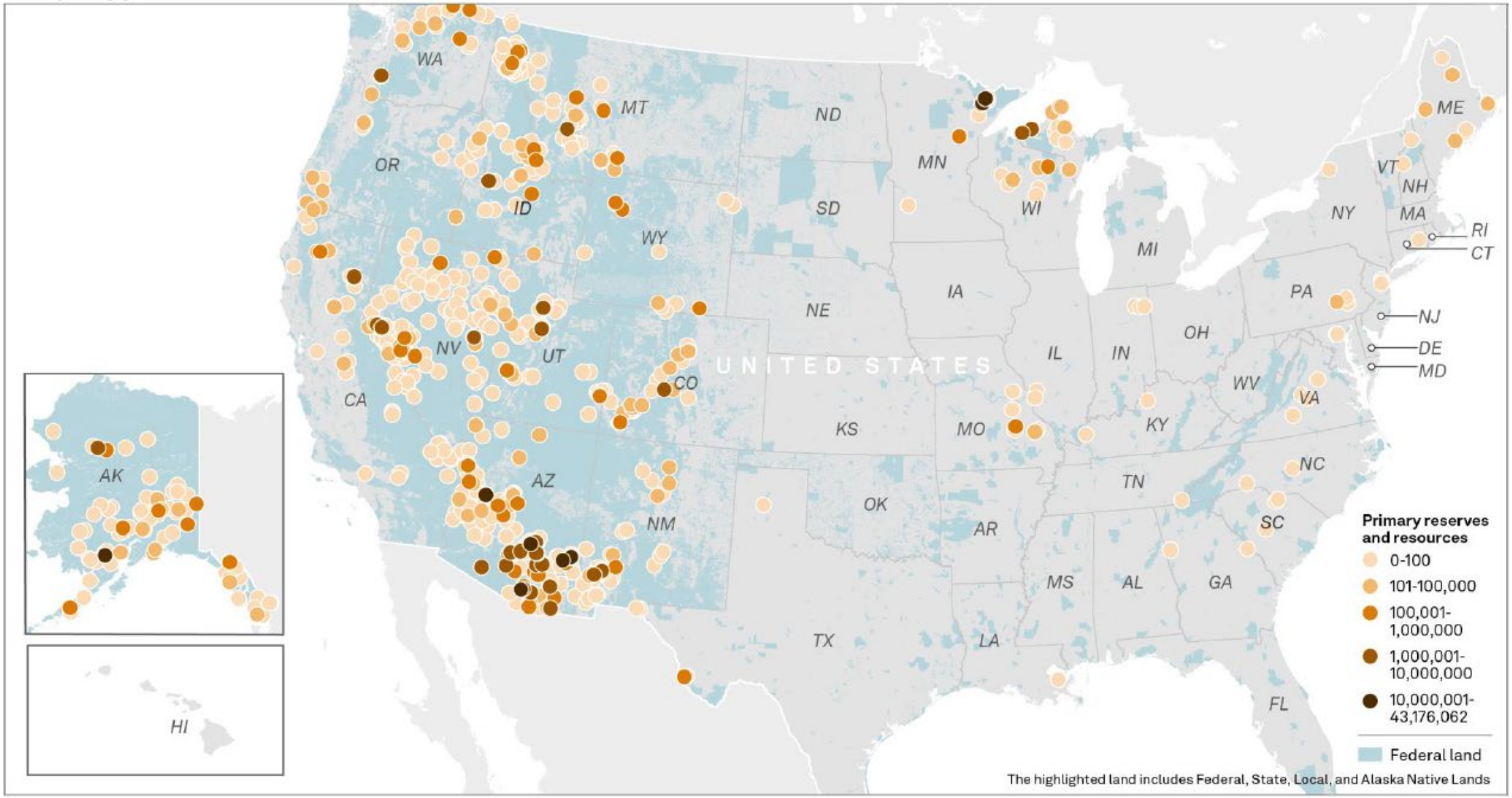
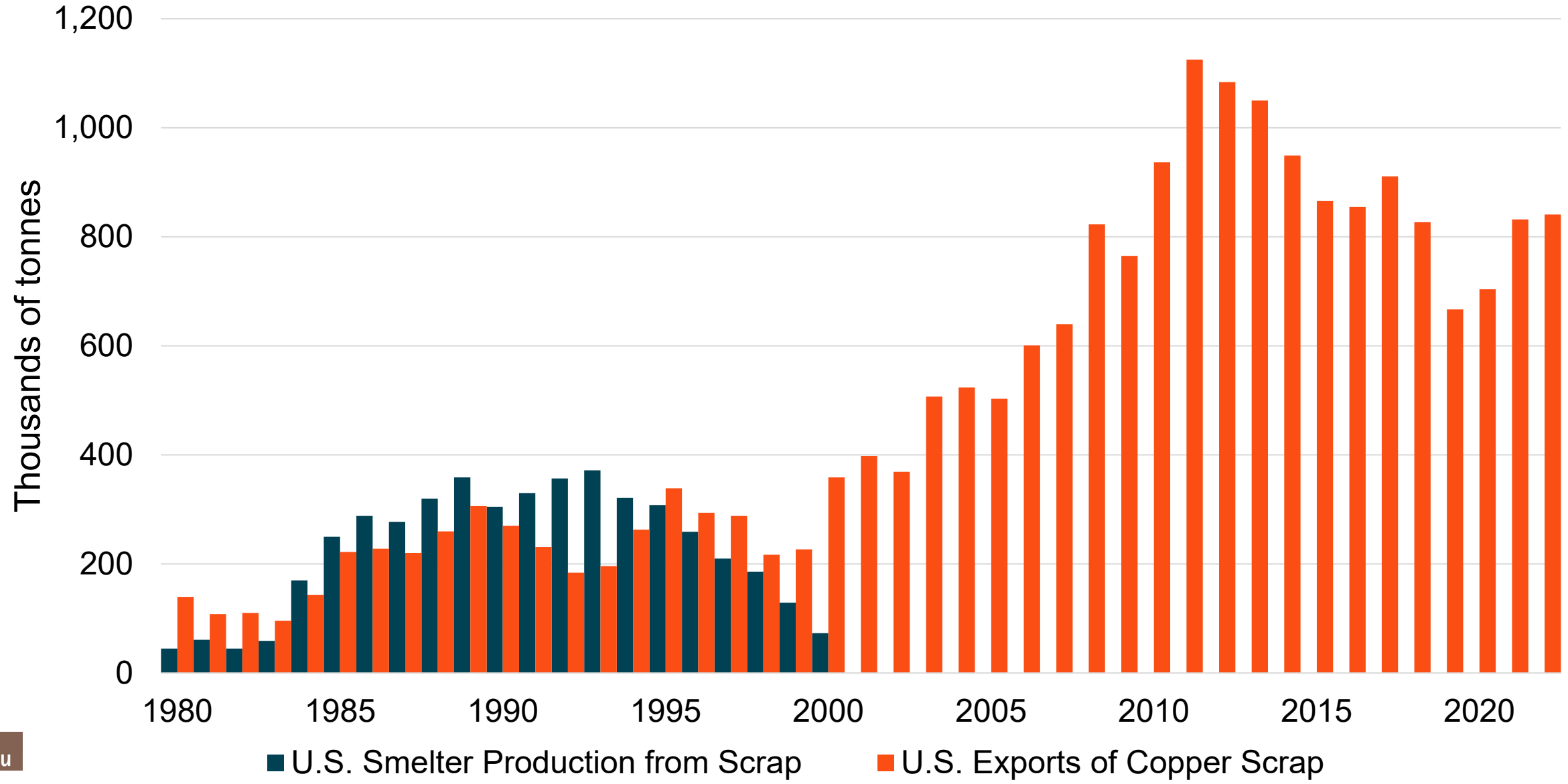
Permitting challenges stymie access to America's 275Mt copper endowment



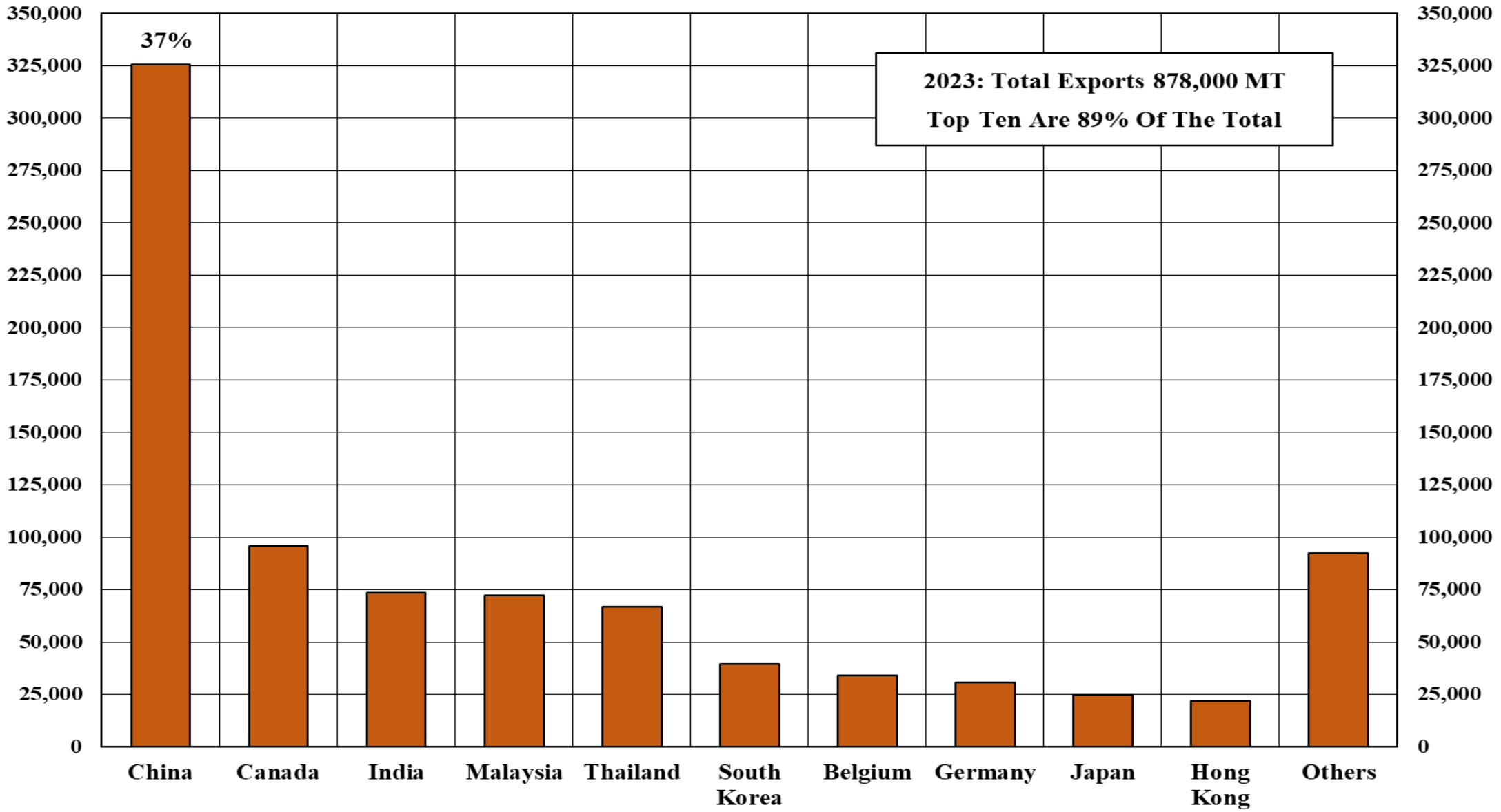
Data compiled Dec 4, 2023.
Sources: The United States Bureau of Land Management; S&P Global: 2014135.

Scrap in focus: U.S. smelter production from scrap vs. scrap exports

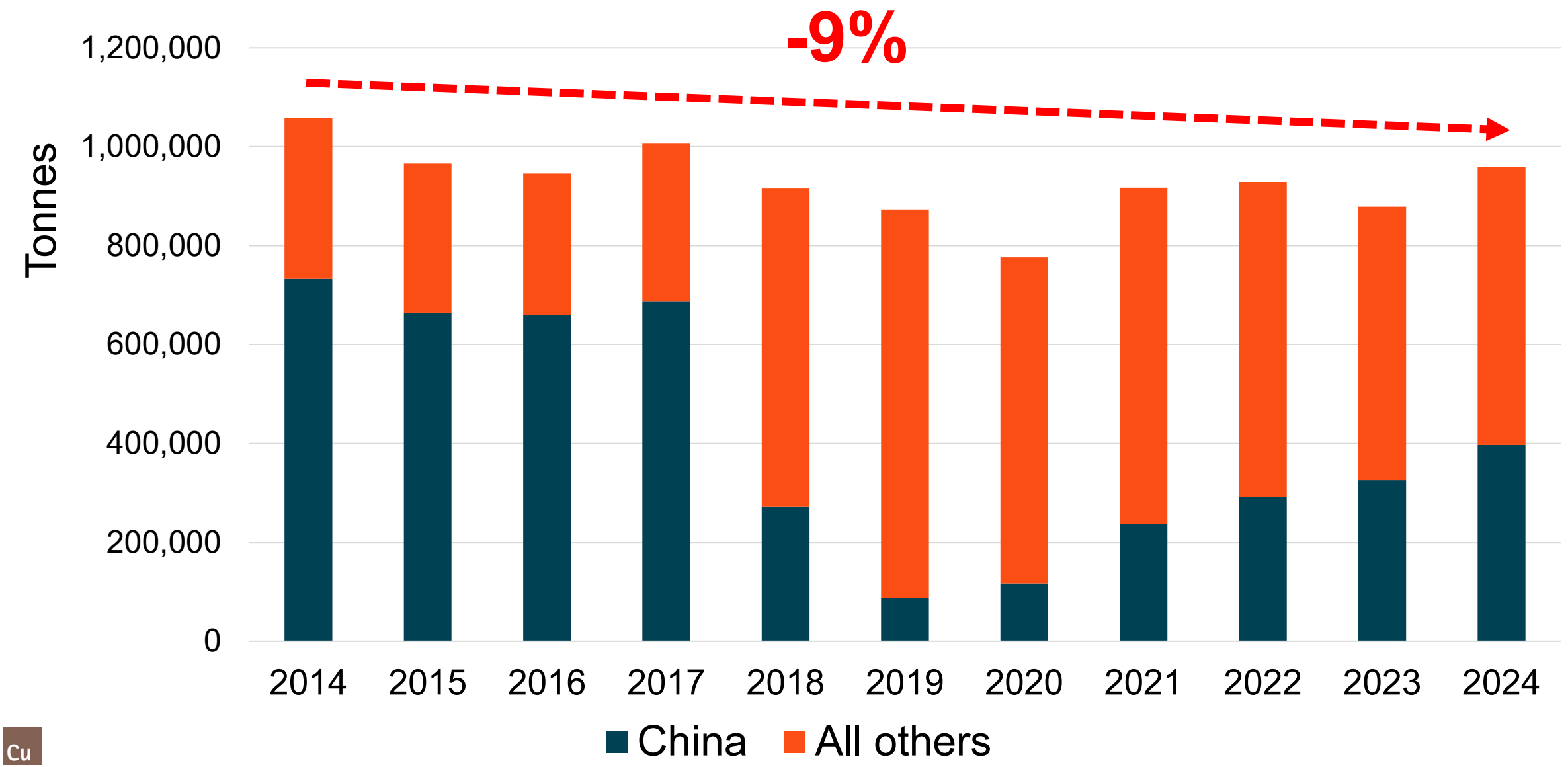


U.S. is the largest copper scrap exporter & China is the largest importer

(U.S. International Trade Commission & U.S. Department of Commerce, 2023)

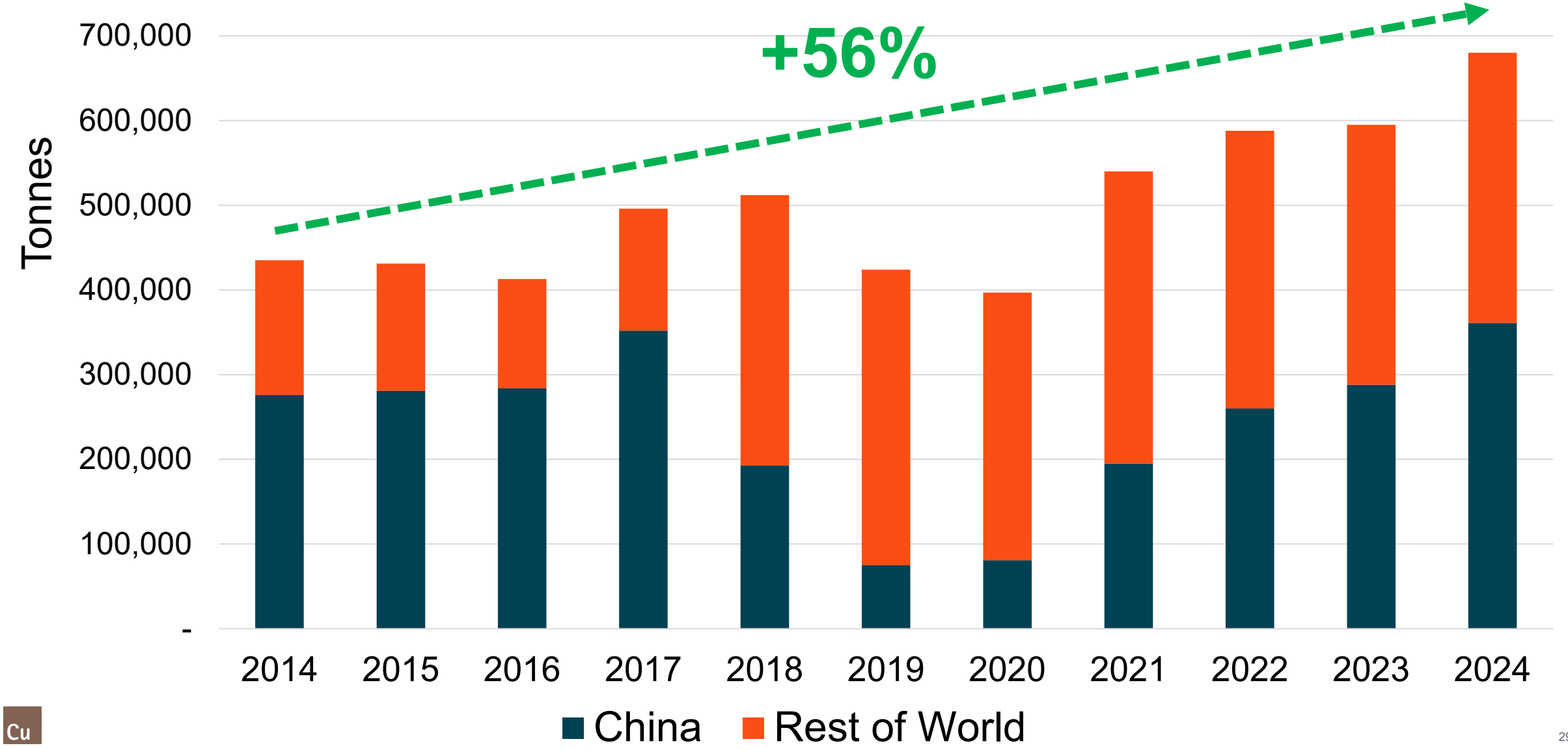


U.S. Total Exports of All Copper-Base Scrap (7404)



Source: USITC; U.S. Census Bureau, 2023

U.S. Total Exports of Unalloyed Scrap (recyclable now in U.S.)



Source: USITC; U.S. Census Bureau, 2023

Copper tariffs?

THE WHITE HOUSE

Fact Sheet: President Donald J. Trump Addresses the Threat to National Security from Imports of Copper

SECURING AMERICA'S COPPER SUPPLY: Today, President Donald J. Trump signed an Executive Order launching an investigation into how copper imports threaten America's national security and economic stability.

- The Order directs the Secretary of Commerce to initiate a Section 232 investigation under the Trade Expansion Act of 1962.
- This investigation will assess the national security risks arising from the United States' increasing dependence on imported copper, in all its forms, and the potential need for trade remedies to safeguard domestic industry.
- The investigation will culminate in a report identifying vulnerabilities in the copper supply chain and providing recommendations to enhance the resilience of America's domestic copper industry.

ADDRESSING THE THREAT TO NATIONAL SECURITY: President Trump recognizes that an overreliance on foreign copper, in all its forms, could jeopardize U.S. defense capabilities, infrastructure development, and technological innovation.

- Copper is an essential material for national security, economic strength, and industrial resilience.
  - Copper plays a vital role in defense applications, infrastructure, and emerging technologies like clean energy, electric vehicles, and advanced electronics.
  - Copper is the Defense Department's second-most utilized material.
- Despite possessing ample copper reserves, America's smelting and refining capacity lags behind global competitors like China, which controls over 50% of global smelting.
  - The United States isn't even in the top five nations in copper smelting capacity.
- America's reliance on copper imports has surged from virtually 0% in 1991 to 45% of consumption in 2024, heightening risks to supply chain security.
- Foreign overcapacity in smelting and refining, coupled with potential export restrictions from other nations, threaten to disrupt copper availability for U.S. defense and industry needs.

Image credit: ChosunBiz

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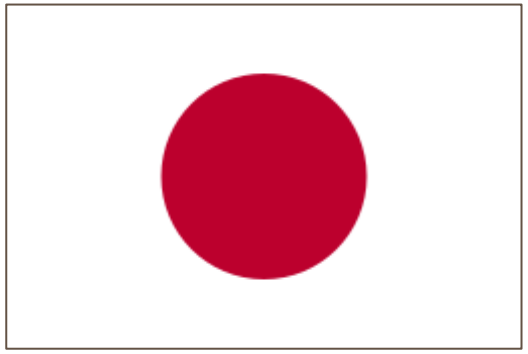
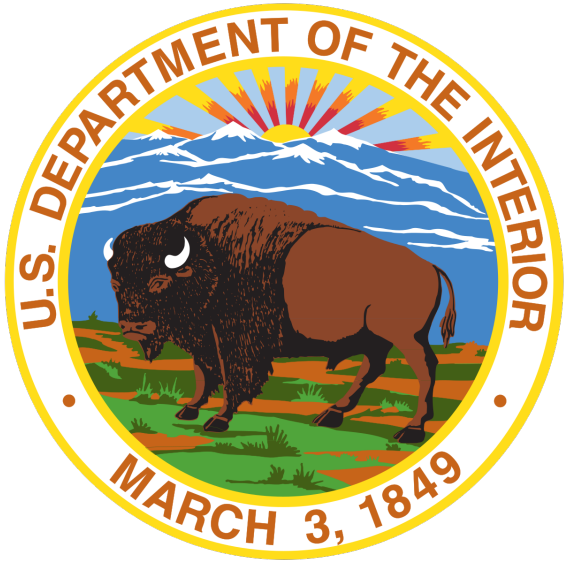
Countries around the world are developing their own “critical” lists to both support increased domestic production as well as keep important minerals within their borders








U.S. Critical Minerals – supporting supply AND demand



USGS
science for a changing world

IRA 45X Advanced Manufacturing Clean Energy Tax Credit

DOE Title 17 Clean Energy Financing Program

IRA EV Tax Credit Domestic Content Requirements

Fast-41 Permitting Dashboard

Defense Production Act Support

Congressional Legislation to Support Domestic Supply Chains

48C Qualifying Advanced Energy Project Credit

Copper and the *Critical Minerals List*

The USGS defines a Critical Mineral as having three components, and copper meets each one:

- It is essential to ***economic*** and ***national security***
- It plays a key role in ***energy technology, defense, consumer electronics,*** and other applications
- Its ***supply chain is vulnerable to disruption***

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2022 Critical Minerals List: Copper did not meet scoring criteria

	USGS Calculations				Copper Development Association Calculations				
	2015	2016	2017	2018	2019	2020	2021	2022 H1	2022E
Economic Vulnerability	0.932	0.921	0.933	0.922	0.931	0.933	0.978	0.968	0.968
Disruption potential	0.103	0.101	0.145	0.119	0.141	0.146	0.161	0.163	0.163
Trade exposure	0.309	0.307	0.380	0.318	0.367	0.367	0.493	0.479	0.477
Annual Supply Risk	**0.310**	**0.306**	**0.372**	**0.327**	**0.364**	**0.368**	**0.427**	**0.423**	**0.422**
Recovery Weighted 4-Year Supply Risk				**0.334**	**0.349**	**0.359**	**0.387**	**0.407**	**0.407**

Based on a study by the Copper Development Association using the USGS' methodology, copper meets the cutoff score for inclusion on the Critical Minerals list.

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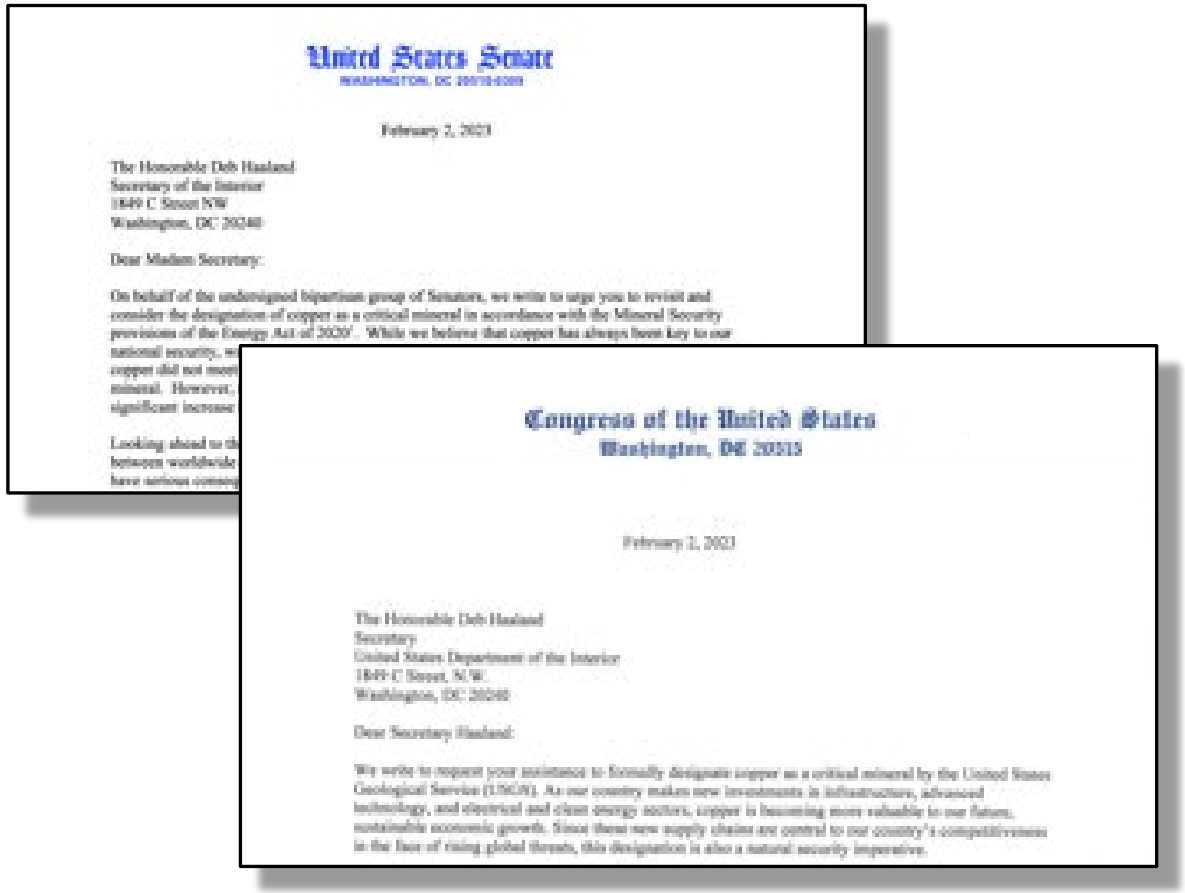
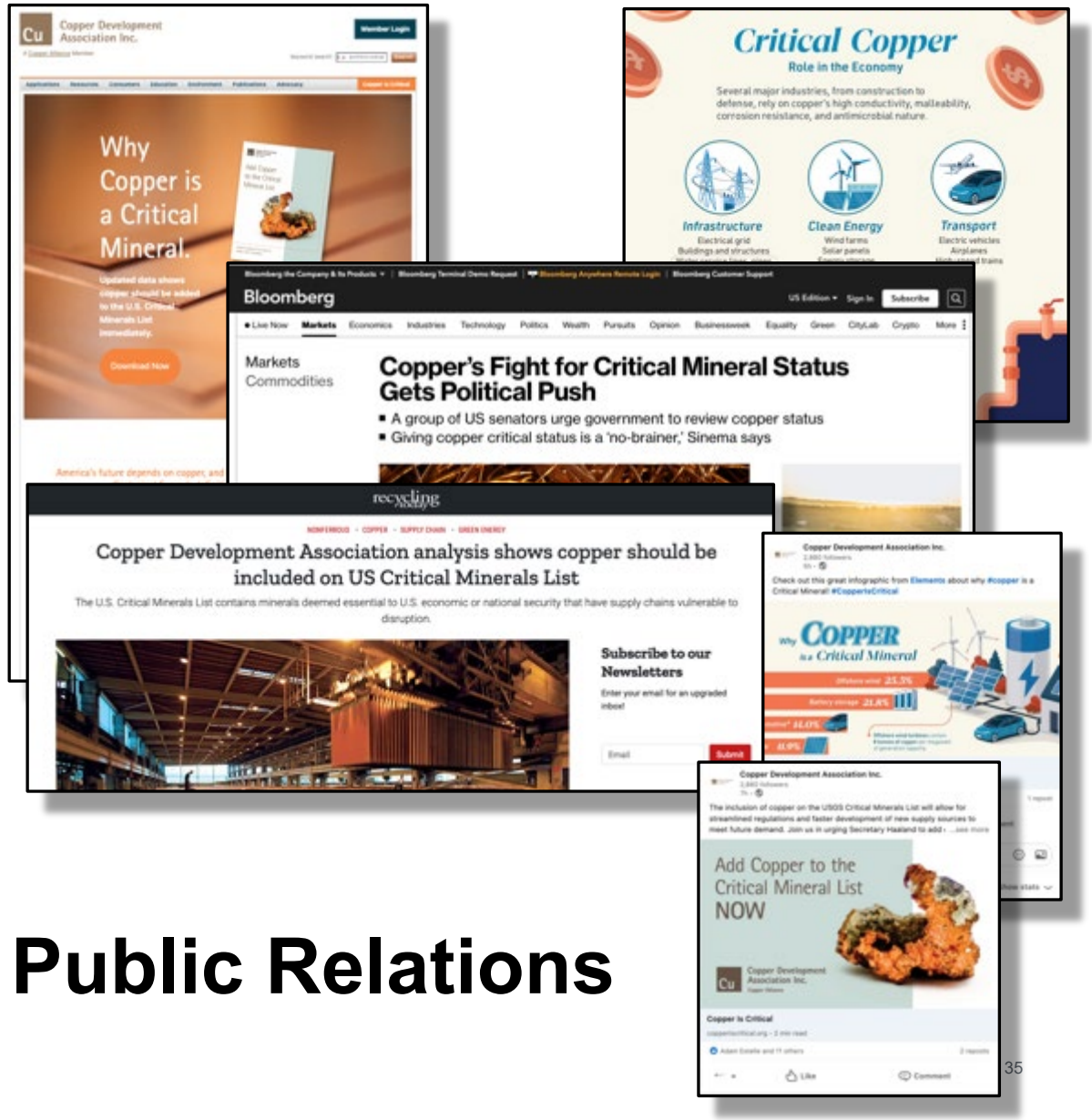
Copper is Critical Campaign

Launched February 2023

www.CopperIsCritical.org



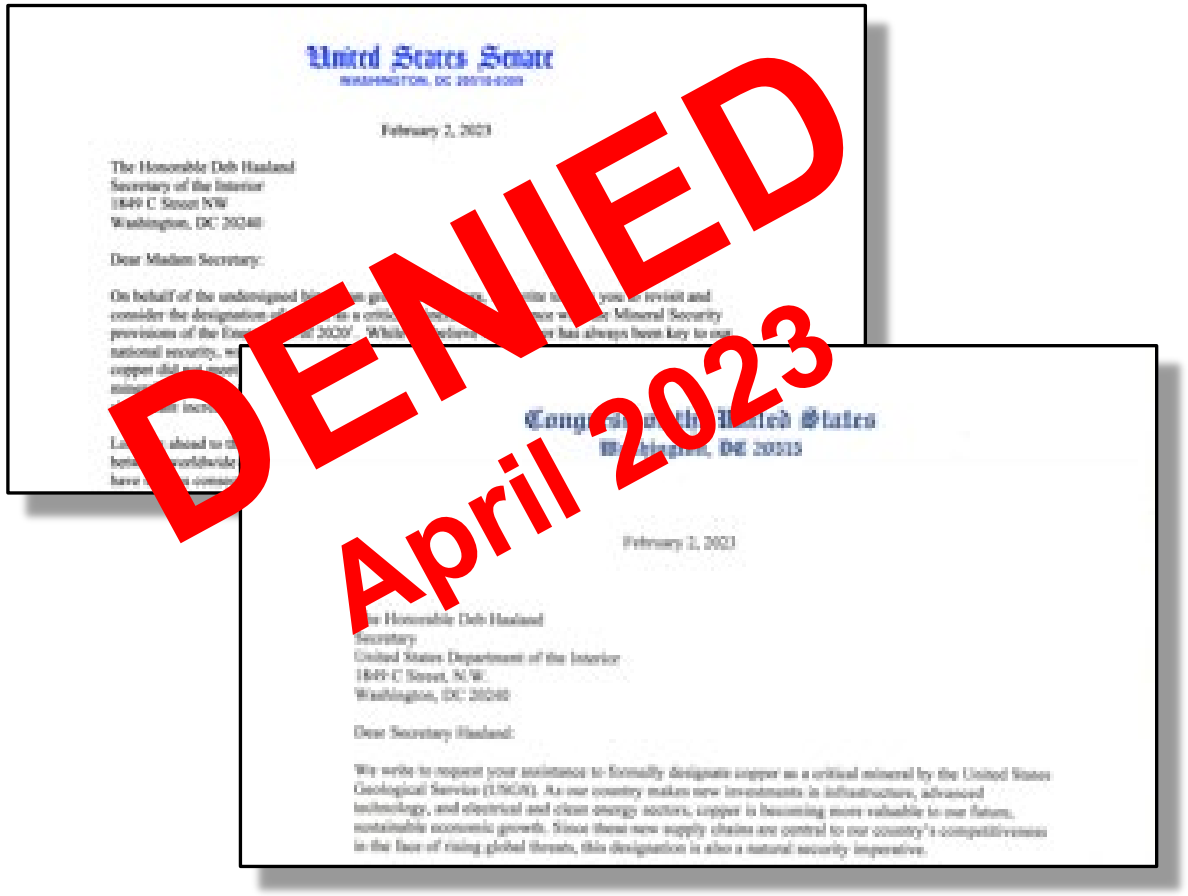
Government Advocacy



Public Relations

Copper is Critical Campaign

Launched February 2023



Government Advocacy

United States Department of the Interior
U.S. Geological Survey
Office of the Director
Reston, Virginia 20192

April 13, 2023

The Honorable Kyrsten Sinema
United States Senate
Washington, DC 20510

Dear Senator Sinema:

Thank you for your letter to Secretary Haaland dated February 2, 2023, requesting that copper be reconsidered for inclusion on the list of critical minerals. I am pleased to respond on behalf of the U.S. Geological Survey (USGS). In this response, we briefly review the approach the USGS follows in leading the interagency development of the list of critical minerals, address the concerns raised in your letter, and highlight the latest data and some specific considerations regarding USGS studies related to copper.

Methodology

The list of critical minerals is based on a methodology developed over several years under the leadership of the USGS and with interagency input coordinated by the White House Office of Science and Technology Policy's National Science and Technology Council (NSTC) Critical Minerals Subcommittee. Minerals were included on the 2022 list of critical minerals[1] based on three evaluations: (1) a quantitative evaluation wherever sufficient data were available, (2) a semi-quantitative evaluation of whether the supply chain had a single point of failure, and (3) a qualitative evaluation when other evaluations were not possible[2]. The quantitative methodology is based on an approach that defines supply risk as the confluence of the following three factors: (1) the likelihood of a foreign supply disruption, (2) the dependency of the U.S. manufacturing sector on foreign supplies (i.e., net import reliance), and (3) the vulnerability of the U.S. manufacturing sector to a supply disruption. The consideration of these factors to assess criticality is consistent with the definition of a "critical mineral" from the Energy Act of 2020.

For both accuracy and completeness, the list is based on the most recent data for actual consumption and production of mineral commodities. Your letter notes that data from 2018 were the most recent used in developing the 2022 list of critical minerals. Development and publication of the new methodology and the associated quantitative analysis was completed in 2020–2021, using data from 2018, the most recent year for which complete datasets (both USGS and external) were available for inclusion in the analysis. Subsequently, the methodology and draft list were subject to a rigorous review process including peer review required of all USGS

[1] https://www.federalregister.gov/documents/2022/02/24/2022-04027/2022-final-list-of-critical-minerals

[2] Nassar, N.T., and Fortier, S.M., 2021, Methodology and technical input for the 2021 review and revision of the U.S. Critical Minerals List: U.S. Geological Survey Open-File Report 2021–1045, 31 p., https://doi.org/10.3133/ofr20211045.

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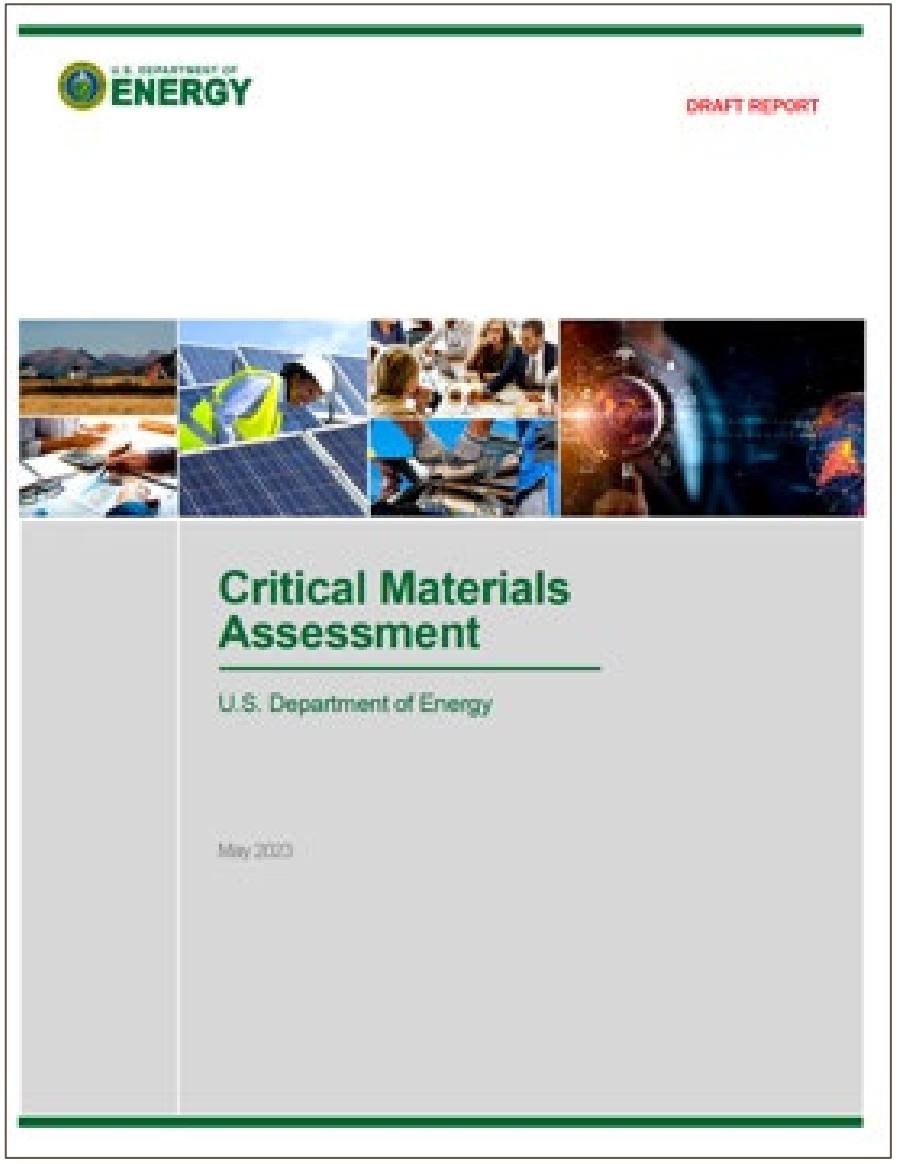
U.S. Dept of Energy Critical Materials List – Cu Added July 2023

Figure 3.2 Medium-term (2025–2035) criticality matrix



DOE Critical Material Disadvantage

Cu

Legislative strategy: Critical Mineral Consistency Act

ENERGY ACT OF 2020

DIVISION Z—ENERGY ACT OF 2020

* * * * * * *

TITLE VII—CRITICAL MINERALS

* * * * * * *

SEC. 7002. MINERAL SECURITY.

(a) DEFINITIONS.—In this section:

(1) BYPRODUCT.—The term "byproduct" means a critical mineral—

(A) the recovery of which depends on the production of a host mineral that is not designated as a critical mineral; and

(B) that exists in sufficient quantities to be recovered during processing or refining.

(2) CRITICAL MATERIAL.—The term "critical material" means—

(A) any non-fuel mineral, element, substance, or material that the Secretary of Energy determines—

(i) has a high risk of a supply chain disruption; and

(ii) serves an essential function in 1 or more energy technologies, including technologies that produce, transmit, store, and conserve energy; or

(B) a critical mineral.

(3) CRITICAL MINERAL.—

[(A) IN GENERAL.—The term "critical mineral" means any mineral, element, substance, or material designated as critical by the Secretary under subsection (c).]

(A) IN GENERAL.—The term "critical mineral" means—

(i) any mineral, element, substance, or material designated as critical by the Secretary under subsection (c); and

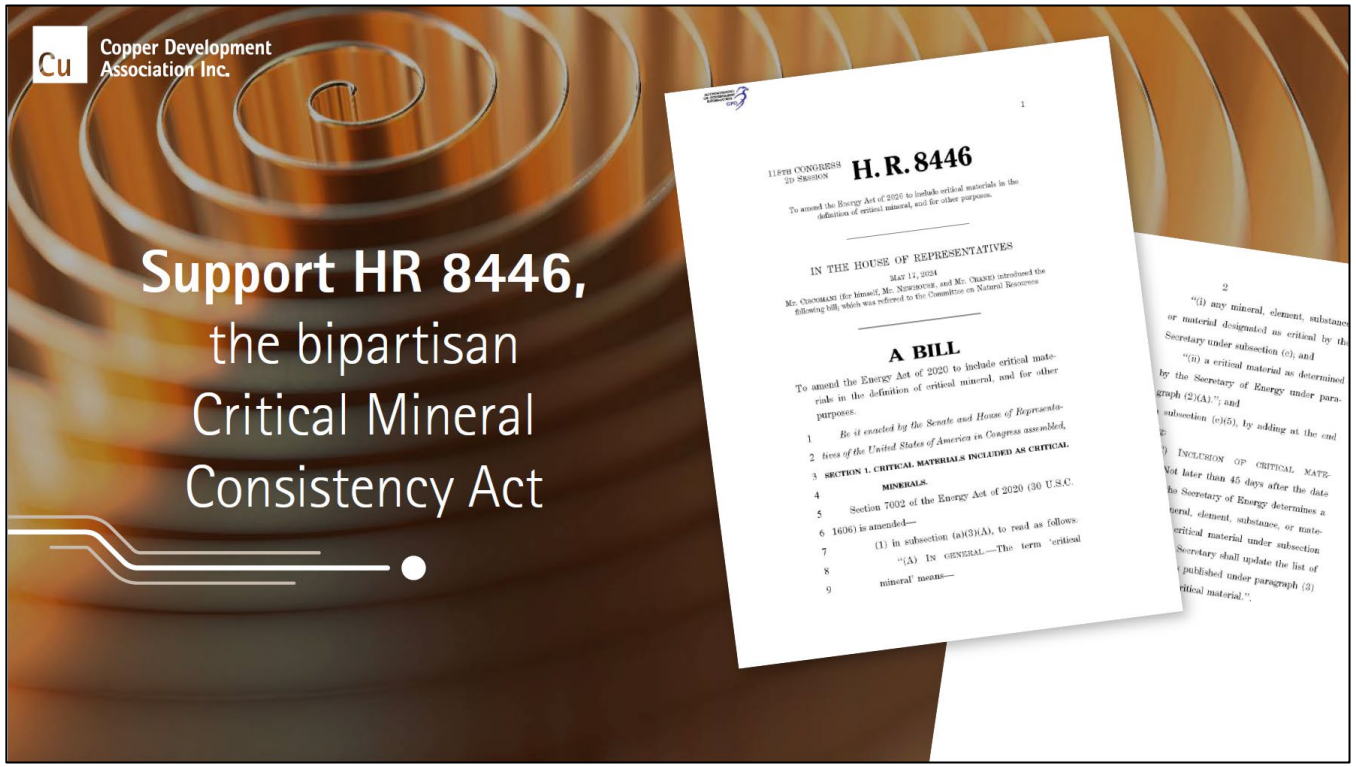
(ii) a critical material as determined by the Secretary of Energy under paragraph (2)(A).

(B) EXCLUSIONS.—The term "critical mineral" does not include—

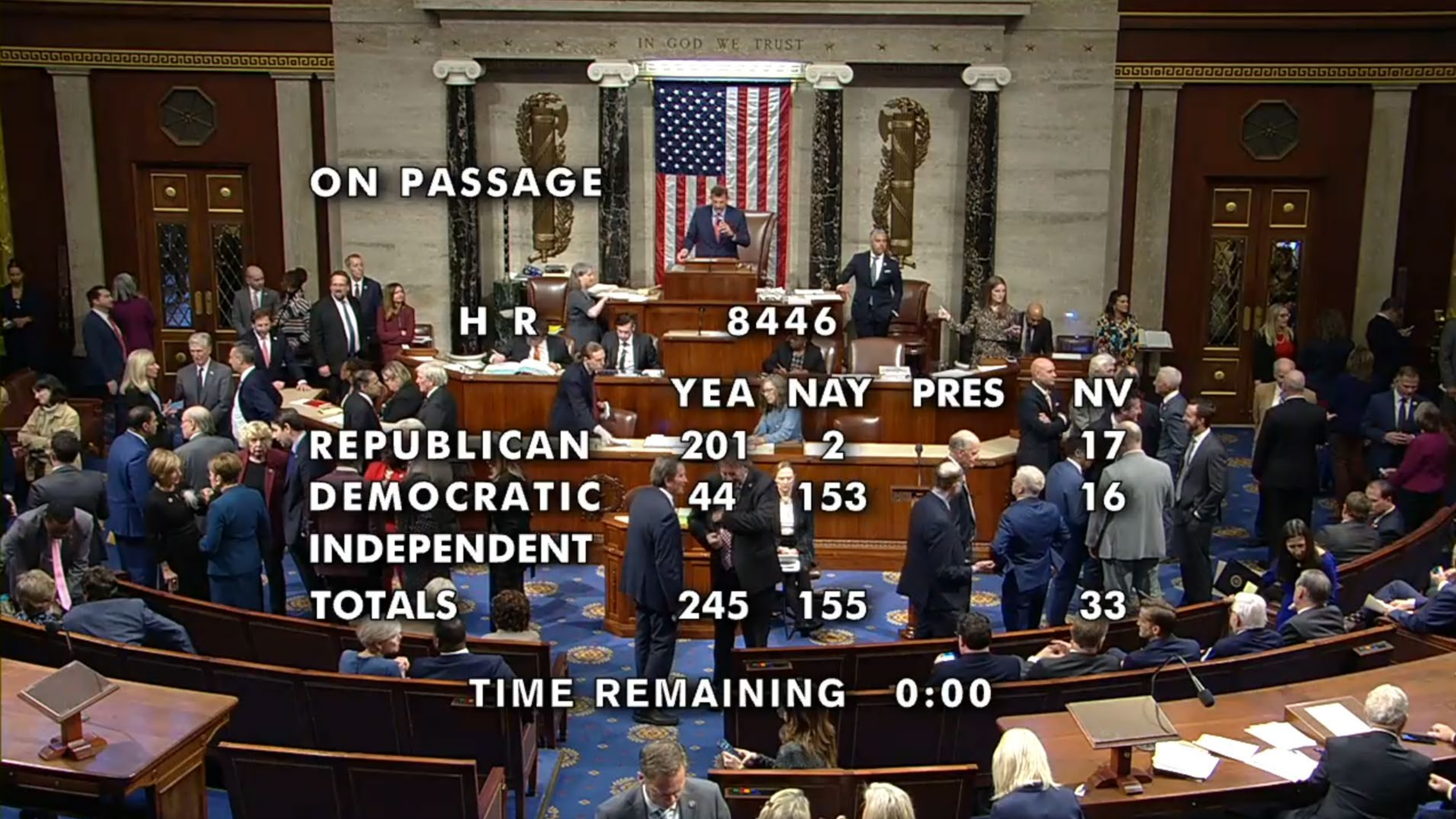
(i) fuel minerals;

(ii) water, ice, or snow;

(iii) common varieties of sand, gravel, stone, pumice, cinders, and clay.



USGS Critical Minerals automatically on DOE list, but not the reverse


IN GOD WE TRUST
ON PASSAGE
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YEA NAY PRES NV
REPUBLICAN 201 2 17
DEMOCRATIC 44 153 16
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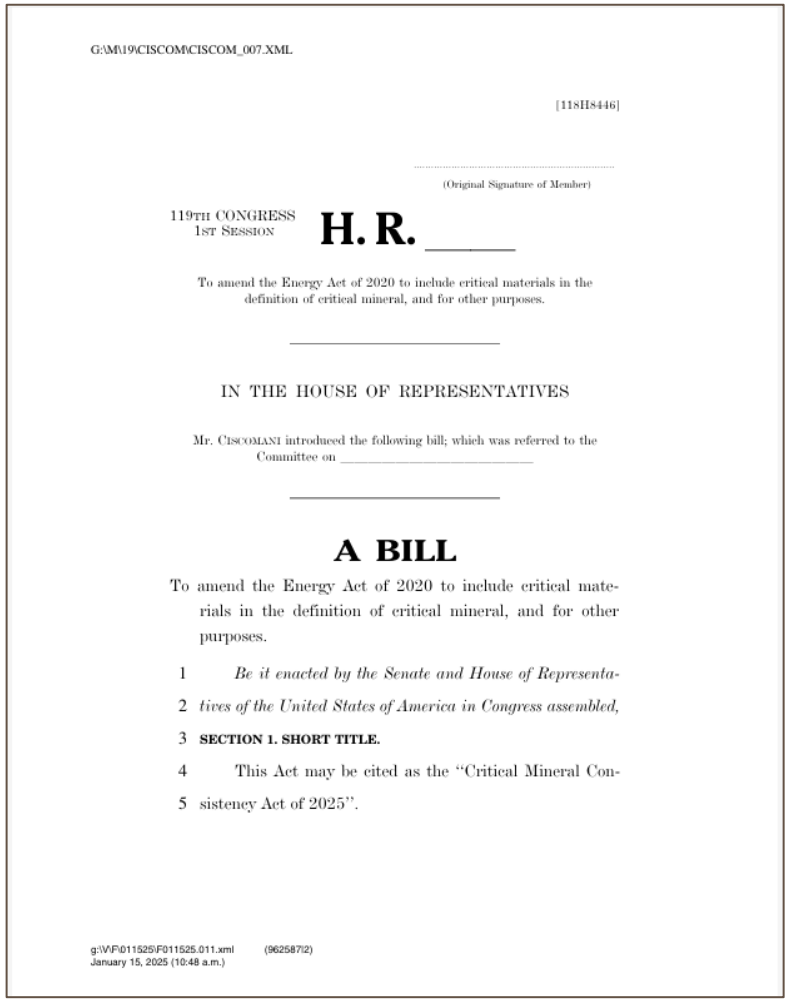
Bipartisan House Members of Congress reintroduced the Critical Mineral Consistency Act (CMCA) in the 119th Congress on January 29; Senate Companion Bill introduced on February 25 with bipartisan co-sponsors.



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[118H8446]

(Original Signature of Member)

119TH CONGRESS
1ST SESSION

H. R. _____

To amend the Energy Act of 2020 to include critical materials in the definition of critical mineral, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

Mr. CISCOMANI introduced the following bill; which was referred to the Committee on _____

A BILL

To amend the Energy Act of 2020 to include critical materials in the definition of critical mineral, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Critical Mineral Consistency Act of 2025".

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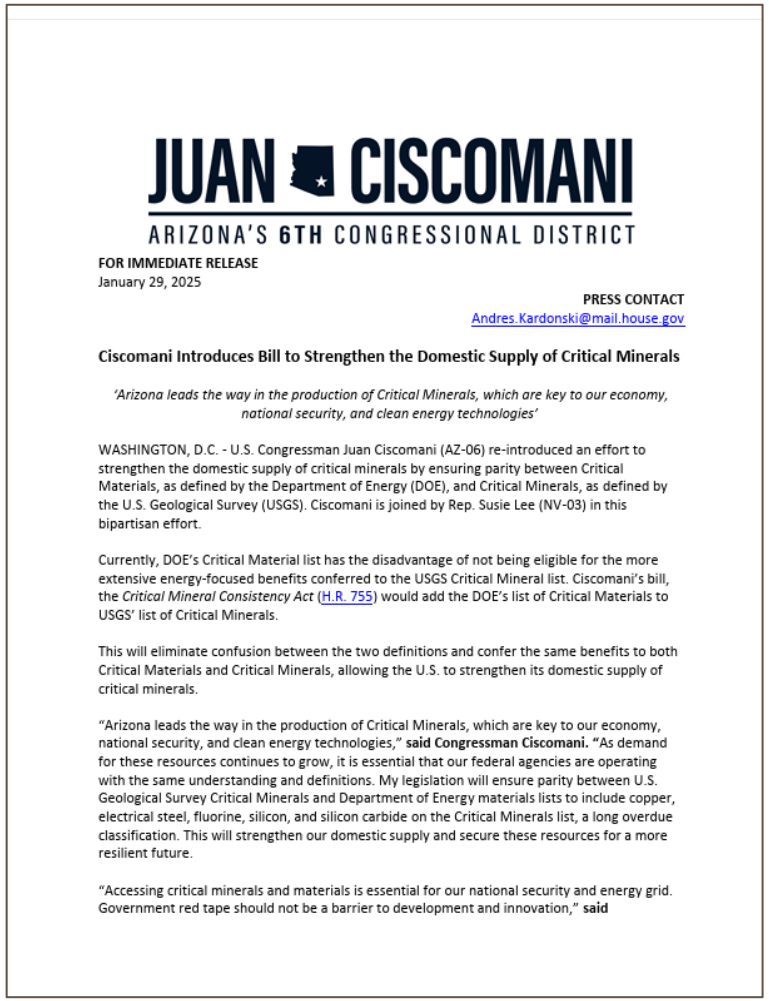
January 15, 2025 (10:48 a.m.)



JUAN CISCOMANI
ARIZONA'S 6TH CONGRESSIONAL DISTRICT

FOR IMMEDIATE RELEASE
January 29, 2025

PRESS CONTACT
Andres.Kardonski@mail.house.gov

Ciscomani Introduces Bill to Strengthen the Domestic Supply of Critical Minerals

'Arizona leads the way in the production of Critical Minerals, which are key to our economy, national security, and clean energy technologies'

WASHINGTON, D.C. - U.S. Congressman Juan Ciscomani (AZ-06) re-introduced an effort to strengthen the domestic supply of critical minerals by ensuring parity between Critical Materials, as defined by the Department of Energy (DOE), and Critical Minerals, as defined by the U.S. Geological Survey (USGS). Ciscomani is joined by Rep. Susie Lee (NV-03) in this bipartisan effort.

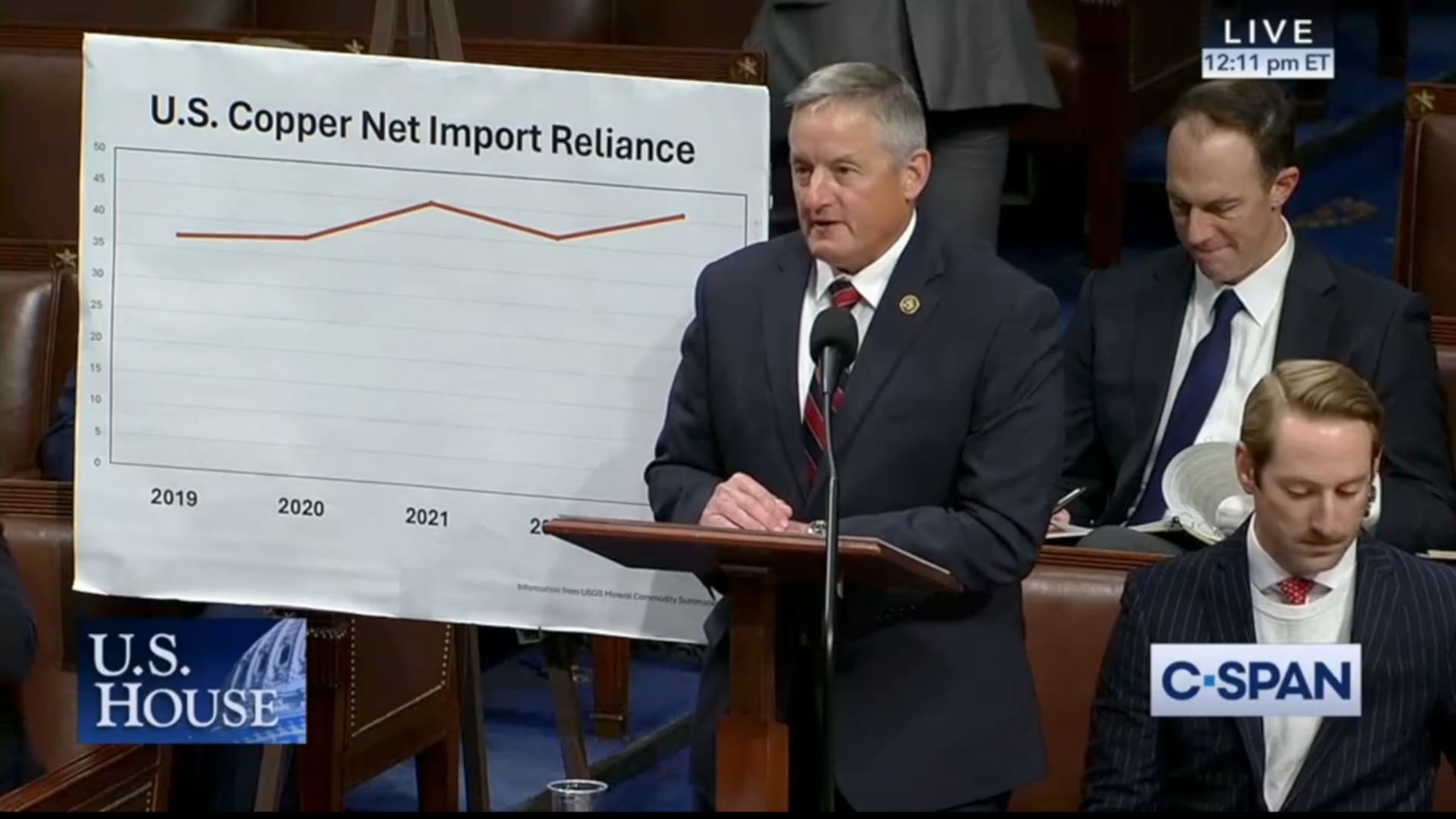
Currently, DOE's Critical Material list has the disadvantage of not being eligible for the more extensive energy-focused benefits conferred to the USGS Critical Mineral list. Ciscomani's bill, the *Critical Mineral Consistency Act* (H.R. 755) would add the DOE's list of Critical Materials to USGS' list of Critical Minerals.

This will eliminate confusion between the two definitions and confer the same benefits to both Critical Materials and Critical Minerals, allowing the U.S. to strengthen its domestic supply of critical minerals.

"Arizona leads the way in the production of Critical Minerals, which are key to our economy, national security, and clean energy technologies," **said Congressman Ciscomani.** "As demand for these resources continues to grow, it is essential that our federal agencies are operating with the same understanding and definitions. My legislation will ensure parity between U.S. Geological Survey Critical Minerals and Department of Energy materials lists to include copper, electrical steel, fluorine, silicon, and silicon carbide on the Critical Minerals list, a long overdue classification. This will strengthen our domestic supply and secure these resources for a more resilient future.

"Accessing critical minerals and materials is essential for our national security and energy grid. Government red tape should not be a barrier to development and innovation," **said**

Call to action: Help us secure copper's inclusion on the list!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U.S. HOUSE
C-SPAN

Copper Development Association Inc.

Thank you!

marcus.elmer@copperalliance.us