

Stewardship. Integrity. Commitment.



Critical Mineral Resources Opportunities for Missouri

Midwest Environmental Compliance Conference 2022

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September 14, 2022*

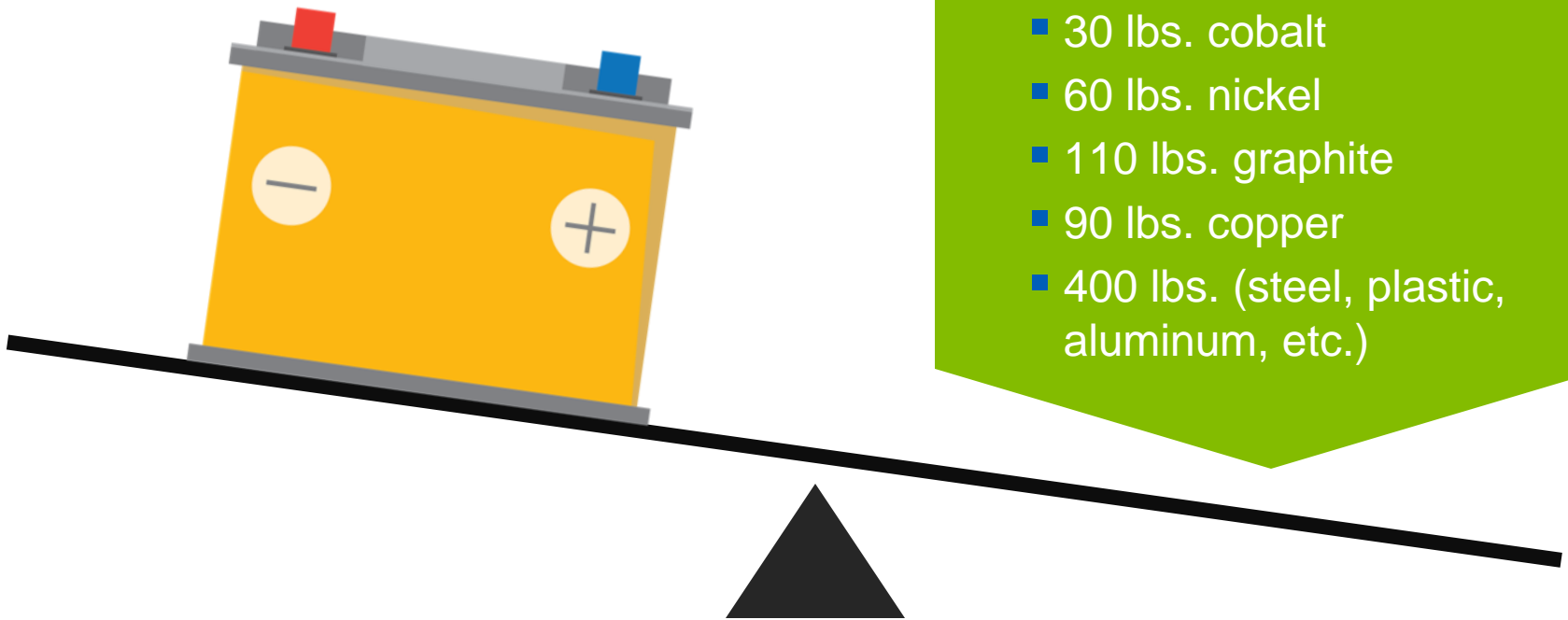


Minerals for a Low Carbon Future

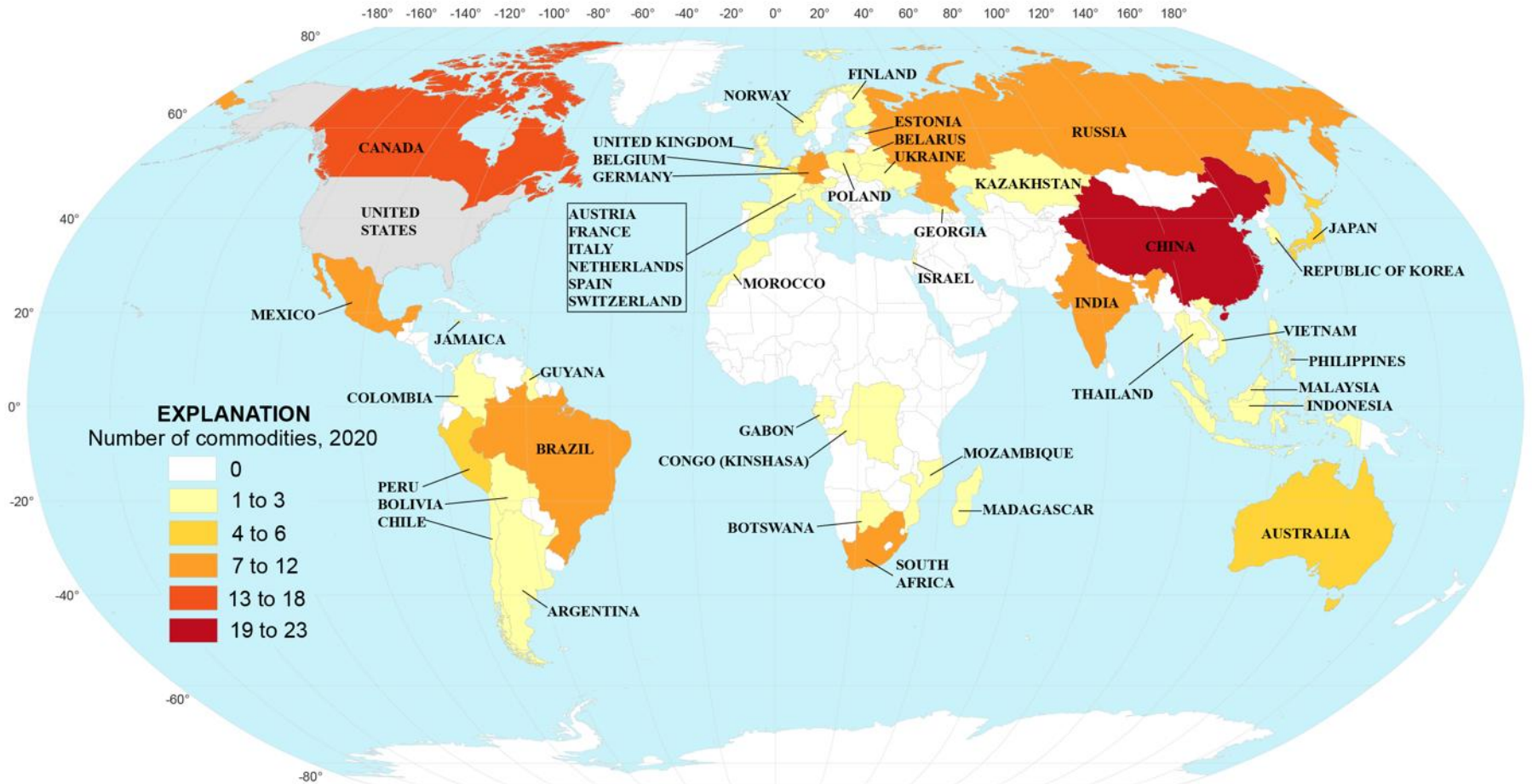


EV Lithium-Ion Battery Example

**One 1,000 lb.
EV battery**



U.S. Critical Minerals Sources

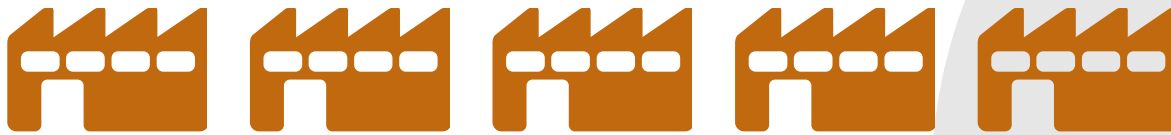


Source: U.S. Geological Survey

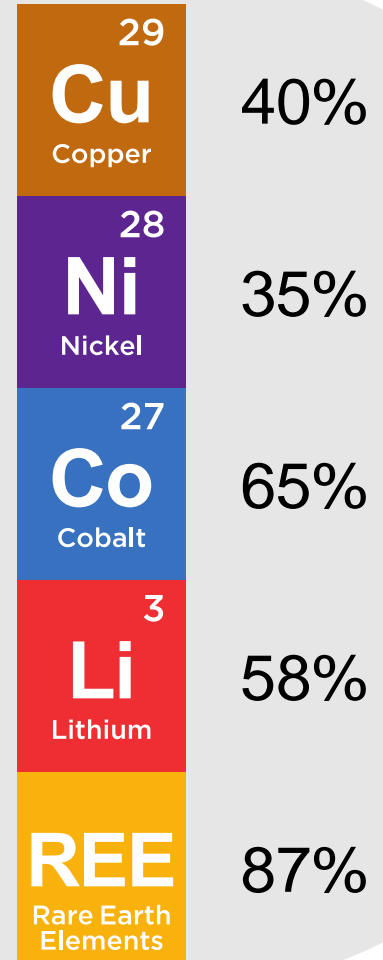
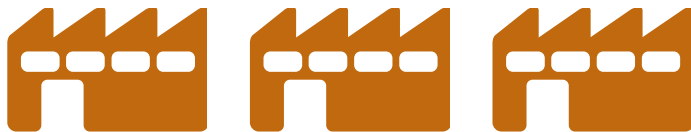
Mining & Mineral Production Today – U.S. #7 in Minerals Production

Mineral Processing


1990 / 48 metals facilities



2021 / 27 metals facilities



KEY

 = 10 smelters

Obstacles to Domestic Mining & Mineral Production



Mine Permitting

- 30+ regulatory programs on federal lands
- 7 – 10 years

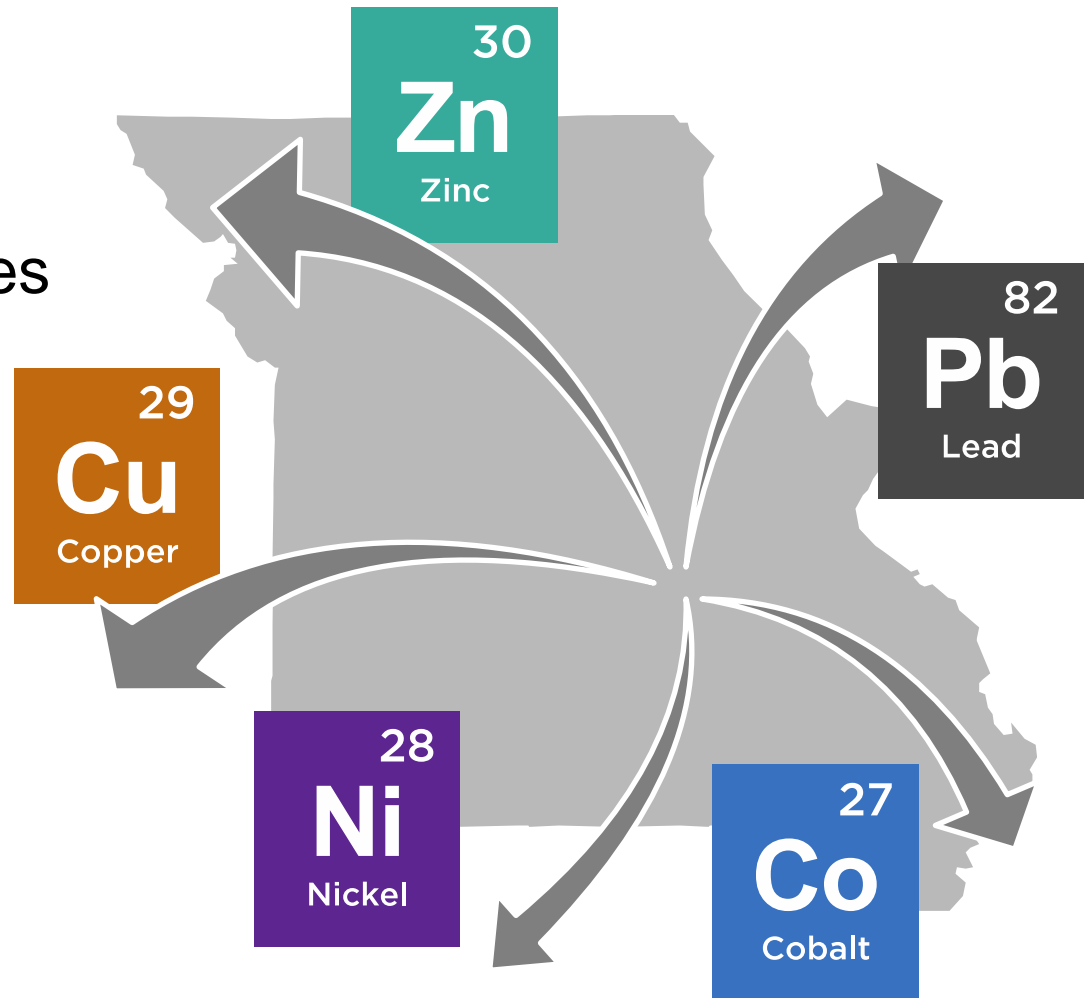


“...A typical mining project loses more than 1/3 of its value as a result of unexpected permitting delays. ... a prolonged process – can cut the expected value of a mine in half before production even begins.”

National Mining Association,
SNL Metals & Mining

Missouri Mining & Mineral Resources

- Mining Resources
 - Lead, copper, zinc
 - Cobalt, nickel
- Recycling Resources
 - Lead, tin, antimony
- Legacy Resources
 - Slag, chat, tailings



Hydrometallurgical Technology Solutions

- Doe Run has been actively pursuing a replacement for pyrometallurgical processes to produce metal with hydrometallurgy.
- The goals of the replacement processes are:
 1. Provide a high recovery of metal from ore and recycled products.
 2. Capture byproducts.
 3. Meet and outperform current and future anticipated US regulatory standards.
 4. Obtain rapid acceptance and permitting.
 5. Extract greater value associated with essential metals:
 - Copper, zinc, cobalt, nickel, tin, antimony

Thank You!