

growth in global copper production has been described as “sluggish.”⁴⁸ Longer term, S&P Global projects that under its most ambitious outlook for supply (i.e., one that contemplates expansions in mining capacity, improved mining and production efficiencies, and increased recycling), there is still an expected shortfall of 1.6 MMt in 2035.⁴⁹ Its much less optimistic outlook, moreover, expects a shortfall close to 10 MMt in 2035.⁵⁰ S&P Global’s findings align with those of others.⁵¹ With respect to copper cathodes, recycling and the addition of secondary copper smelting capacity is unlikely to close expected shortfalls—recycling provides only about 32 percent of current and likely future cathode supply.⁵²

Ensuring and expanding efficient production of copper is critical for national security and the U.S. economy. Primary copper smelting capacity in the United States is critically low and has long been in decline. As noted previously, the Miami Smelter is one of only two primary copper smelters left in operation in the United States and is a key asset that supports Freeport-McMoRan Inc.’s production of some 70 percent of the nation’s domestic copper. ***An inability to maintain or increase throughput at the Miami Smelter—a potential outcome given the Copper Rule’s radical cost ineffectiveness, see supra Section II.A—would have significant impacts on the domestic copper supply chain to the detriment of the national security interests of the United States.***

Domestically, the United States produces some fifty percent of the refined copper it consumes each year.⁵³ The remaining amount is imported, largely from Chile, Canada, and Peru. Notably, however, the U.S. copper supply chain typically results in significant quantities of copper-bearing ores and copper concentrates from domestic mining operations being exported for processing at foreign smelters, typically located in China. Refined copper is then imported back into the United States.⁵⁴ This reflects the reality that while copper mining is often geographically concentrated in a manner that favors the United States, the subsequent stages in the copper production process (i.e., smelting, refining, fabrication, and manufacture of finished goods) are presently, and increasingly, concentrated outside the United States, particularly in China.⁵⁵ A Wood Mackenzie report on the topic confirms that “China has continued to dominate investment in the [copper] supply

⁴⁸ See Int’l Energy Forum, *How Copper Shortages Threaten the Energy Transition* (Jan. 10, 2024), <https://perma.cc/8ZHV-C9AA>; see also Yusuf Khan, *Copper Shortages Threatens Green Transition*, Wall St. J. (Apr. 18, 2023), <https://tinyurl.com/2sm3zh8n> (reporting from industry professionals that the global copper market “is pretty tight” and that “there’s no slack in the system, no buffer”).

⁴⁹ *Future of Copper*, *supra* n.37, at 46.

⁵⁰ *Id.*

⁵¹ See *Bridging the Copper Supply Gap*, *supra* n.39; see also Dr. Kwasi Ampofo, *Copper Prices May Jump 20% by 2027 as Supply Deficit Rises*, BloombergNEF (Oct. 12, 2023), <https://perma.cc/NTY6-7F4P>.

⁵² Int’l Copper Study Grp., *The World Copper Factbook 2024*, at 53 (2024), available at <https://tinyurl.com/ysz47jau>.

⁵³ *Mineral Commodity Summary*, *supra* n.46, at 64.

⁵⁴ *Id.*

⁵⁵ See *Securing Copper Supply*, *supra* n.40, at 3.