demand for [copper] is increasing significantly."[41] There is thus little indication that global copper demand will do anything but increase in the coming decades.

Copper has unique properties—namely, its ability to efficiently conduct electricity and withstand high temperatures, as well as its ductility and recyclability that make it an essential commodity. Copper is critical to the production of electric vehicles, batteries, renewable energy projects, conventional energy projects like hydroelectric, thermal, and nuclear power, and electrification infrastructure (e.g., transmission, distribution, charging).[42] Electric vehicles, in particular, require roughly 2.5 times as much copper as an internal combustion engine vehicle.[43] Copper is used in every major component of an electric vehicle, such as motors and inverters, such that an electric vehicle can use up to a mile of copper wire.[44] Similarly, solar and offshore wind will need, respectively, two and five times more copper per megawatt of installed capacity as compared to power generated using natural gas or coal.[45]

Importantly, the demand pressures arising from the global energy transition are in addition to non-energy transition needs. According to the United States Geologic Survey ("USGS"), in 2024, a little over 40 percent of copper and copper alloy products in the United States was used for building construction, while another 18 percent was used for transportation equipment, and another 7 percent for industrial machinery and equipment.[46] And S&P Global projects that demand from non-energy transition end markets such as building construction, appliances, electrical equipment, and brass hardware and cell phones, as well as expanding applications in communications, data processing, and storage—is also expected to continue to grow, rising at a compounded annual rate of 2.4 percent between 2020 and 2050.[47]

Of course, demand does not exist in a vacuum. On the supply side, there are growing concerns that global copper production will not be sufficient to meet growing demands. In the present term,

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[41] *See* DOE *Critical Materials Assessment*, *supra* n.35, at 148.

[42] *See Future of Copper*, *supra* n.37, at 10, 27 35; Int'l Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions* 5 8 (2021), https://perma.cc/TM48-BV8W; Jon Lynch, *Copper's Role in Growing Electric Vehicle Production*, CME Group (April 20, 2021), https://perma.cc/N72L-FJJH.

[43] *Future of Copper*, *supra* n.37, at 28.

[44] *See Powering Up the Electric Vehicle*, Wood Mackenzie (Aug. 13, 2019), https://perma.cc/E73G-G8HX; *see also* DOE *Critical Materials Assessment*, *supra* n.35, at 15 (explaining how and why copper is a prevalent material in electric vehicles).

[45] *Future of Copper*, *supra* n.37, at 33; *see also* DOE *Critical Materials Assessment*, *supra* n.35, at 36, 42 45 (discussion of prevalence of copper in wind energy components and electric grid technologies and components).

[46] U.S. Geological Survey, *Mineral Commodity Summary: Copper* 64 (2025), https://perma.cc/E3M4-BMBT [hereinafter *Mineral Commodity Summary*]; *Copper Statistics and Information*, U.S. Geological Survey, https://perma.cc/H2UF-HL8Y (last visited Mar. 27, 2025).

[47] *Future of Copper*, *supra* n.37, at 11.

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