# Energy Transition Commodities – Spotlight on Copper

Published 4 March 2024

**Mobeen Tahir**
Director, Macroeconomics and Thematic Research

## Key Takeaways

- Copper is at the core of the core of the energy transition as an irreplaceable commodity and stands to benefit from the push towards clean technologies
- At the United Nations Climate Change Conference (COP28), world leaders have pledged to triple global renewable energy capacity by 2030. We believe this will create a surge in copper demand which will push prices higher and thereby incentivise more investment in primary (mining) and secondary (recycling) supply
- Copper is looking to redefine itself from being a cyclical commodity to one that has a structural tailwind from the energy transition behind it

The HMS Beagle, the naval vessel used by Charles Darwin for his voyages around the world, was built in 1825 with copper skins below the water line. The purpose of this copper sheathing was to protect the hull of the ship from biofouling, i.e., the attachment of unwanted organisms that can slow the vessel down and affect its longevity. Today, boats and ships often use copper-based paints to provide the same function.

Humans have been familiar with the qualities and diverse applications of copper for over 10,000 years. Around 4000 BC to 3500 BC, the science of metallurgy emerged in Egypt when copper was heated, moulded into shapes and alloyed to create bronze – giving rise to the Bronze Age[1].

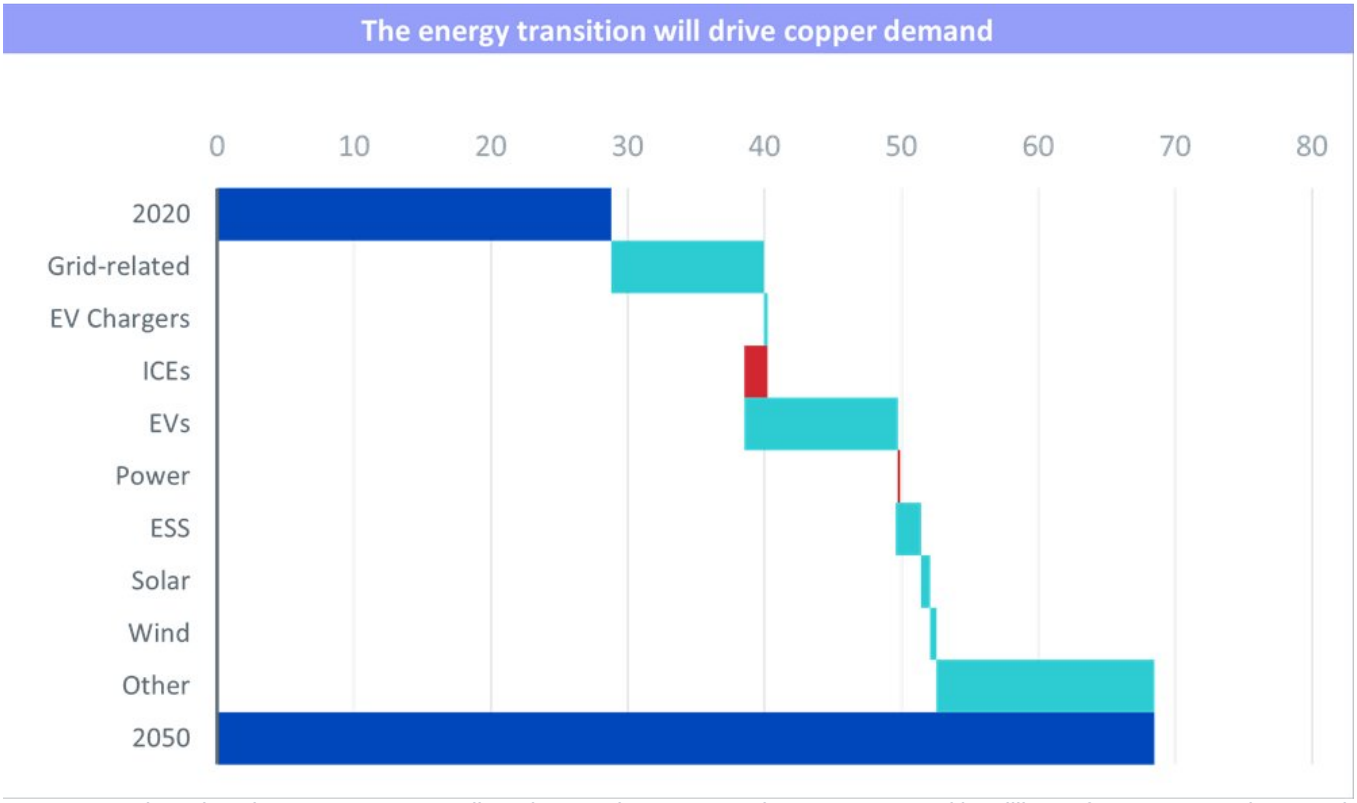
Today, copper is often referred to as the bellwether for the global economy, with its demand signalling how well the economy is doing. However, it is its strong electrical conductivity, energy efficiency, and its ability to be moulded into shapes and drawn into wires that have made copper a core energy transition commodity.

In this blog, we discuss copper's role in the energy transition and key considerations related to its demand and supply.

## Importance in the energy transition

Being an enabler of electrification, copper is at the heart of the energy transition. According to our energy transition industry expert partners Wood Mackenzie, copper's annual demand is expected to rise from around 28 million tonnes in 2020 to over 68 million tonnes[2] by 2050 – driven almost entirely by emerging

sources of demand like electric vehicles, charging infrastructure, renewable energy, and energy storage systems.

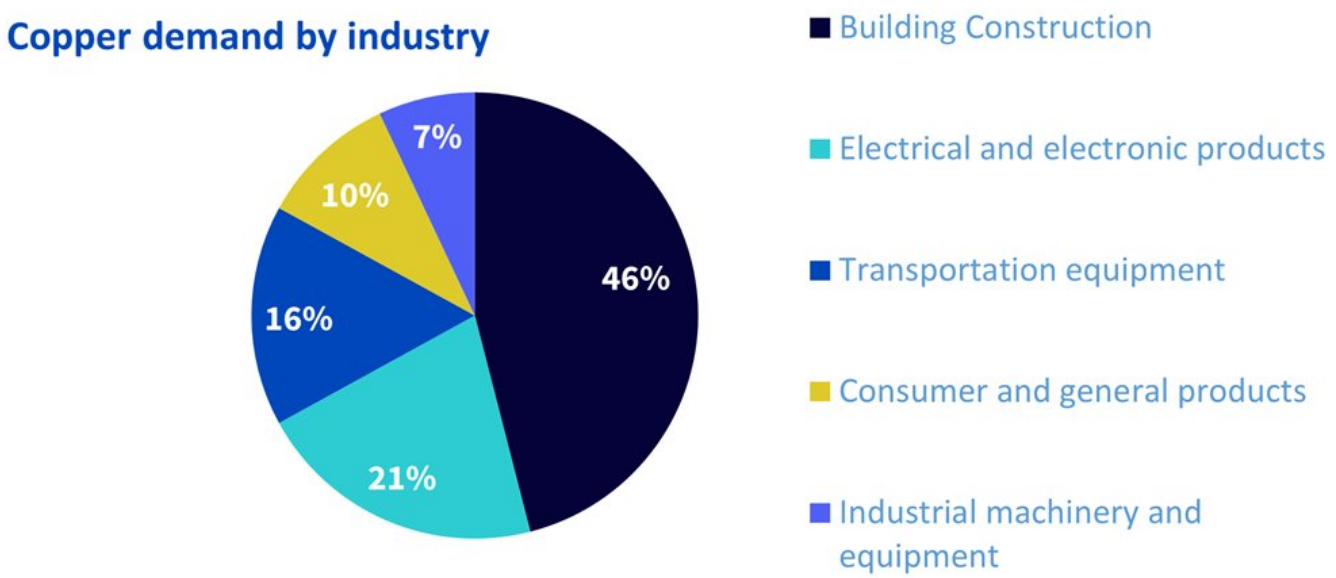



Source: Wood Mackenzie, 2023. Forecasts aligned to 1.5-degree scenario. Data presented in Millions of Tonnes. Negative growth in red. **Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.**

At the United Nations Climate Change Conference (COP28), world leaders have pledged to triple global renewable energy capacity by 2030. This audacious goal is only achievable through greater quantities of key raw materials like copper. But the production of copper through new mines takes time. According to S&P Global's 2023 report, that studied 34 copper mining projects, going from discovery to production took an average of 16 years. At WisdomTree, we believe the push for green technologies will create a surge in copper demand which will push prices higher and thereby incentivise more investment in primary (mining) and secondary (recycling) supply. But supply could be playing catch-up with demand in the coming years. This is where the opportunity lies for investors.

## Sources of demand

Today, copper and copper alloy products are used across a wide range of industries. Data from the US Geological Survey about copper's domestic use illustrates this (see figure below):




Source: US Geological Survey Mineral Commodity Summaries, 2023. Data shows domestic use for the US.

In terms of countries, China is by far the biggest consumer of copper with an estimated consumption of 6.75 million metric tons in 2023. The United States ranks at number two with an estimated 2023 consumption of 3.8 million metric tons – out of a total global consumption of around 28 million metric tons[3].

Because of China's dominance as the biggest source of demand, manufacturing activity in the country is often used as a heuristic to gauge the cyclical prospects of copper. Moreover, given copper is deeply embedded across multiple industrial applications, it is seen as a cyclical asset with its fate tied to the ebb and flow of the economy. We believe the new structural source of demand growth from the energy transition is currently underappreciated by markets, which presents investors with an opportunity to view copper as a potential thematic investment.

In 2023, weak sentiment towards China's economic growth was a drag on copper prices. But China is transitioning from using copper just for its traditional purposes like consumer electronics and construction to buying large quantities of the metal for electrifying its energy system. China is leading the world in its deployment of renewable energy, battery storage, electric vehicles, and charging infrastructure.

## Sources of supply

Chile and Peru are the biggest suppliers of copper worldwide. Chile's share of global supply stands at around 27% while Peru's share is around 11%[4]. The Democratic Republic of Congo, China, and the United States are other key copper producers.

Five out of the 10 biggest copper mines are in either Chile or Peru. The largest mine in the world is the Escondida Mine in Antofagasta, Chile, which produced an estimated 1.06 million tonnes of copper in 2022[5]. The mine is expected to operate until 2078.

This expected life of mines underscores another key point about copper supply. Copper is available in abundance in the earth's crust. Global copper reserves – deposits that have been discovered, evaluated, and assessed to be profitable, currently stand at around 870 million metric tons. Copper resources – discovered deposits that are potentially profitable and undiscovered deposits based on preliminary geological surveys – currently stand at around 5,000 million metric tons[6]. However, in the decade after the global financial crisis, mining investment for commodities needed in the energy transition largely trended downwards[7]. We believe a tailwind behind commodities from the energy transition will incentivise more investment across the value chain of metals like copper.

Copper's current supply concentration creates a risk to copper output. In recent years, miners in Chile and Peru have faced resistance from the masses for further expansion in mining activity, due to environmental concerns creating political pressure on the governments. With demands to produce more on the rise from the energy transition, if the countries move to tighten approval processes for expansion in mining activity, supply deficits in copper could widen despite the abundant availability of the metal in the earth. This issue can be exacerbated by declining ore grades (the quality of raw material extracted from the earth that is processed and purified), a constant challenge faced by miners that requires more investment to overcome.

*Copper can be recycled repeatedly without losing its physical properties. Currently around a third of total copper supply comes from recycled metal[8].*

The silver lining for copper, to reduce its dependence on primary supply from mining, is recycling. Copper's recyclability makes a compelling case for scaling up the recycling industry. More recycled metal will foster sustainable growth in copper supply and reduce the world's dependence on new mining.

## Conclusion

Thus, overall, copper is looking to redefine itself from being a cyclical commodity to one that has a structural tailwind from the energy transition behind it. We believe demand growth is expected to outpace supply growth in the years to come creating an opportunity for investors to consider copper, among other similar industrial metals, a thematic investment opportunity.

## WisdomTree's investment solutions

At WisdomTree, we offer a range of solutions for investors interested in copper. WisdomTree Copper (COPA) gives investors exposure to the metal through commodity futures. WisdomTree also offers a range of commodity futures baskets that feature copper. Notably, WisdomTree Energy Transition Metals and WisdomTree Battery Metals have been developed in partnership with industry experts Wood Mackenzie to identify the most important commodities in the energy transition and battery themes, respectively, and weigh them in appropriately.

## Sources

[1] Copper.org, 2024.

[2] Some sources of data refer to tonnes and others refer to metric tons. Both are used interchangeably in industry and refer to 1000kg of mass.

[3] Statista, January 2024.

[4] Statista, March 2023 based on production numbers from 2021.

[5] Mining-technology.com

[6] Copper Alliance, 2024.

[7] FD Intelligence, 2023.

[8] Copper Alliance, 2024.

## Important Risks Related to this Article

# IMPORTANT INFORMATION

**Marketing communications issued in the European Economic Area ("EEA"):** This document has been issued and approved by WisdomTree Ireland Limited, which is authorised and regulated by the Central Bank of Ireland.

**Marketing communications issued in jurisdictions outside of the EEA:** This document has been issued and approved by WisdomTree UK Limited, which is authorised and regulated by the United Kingdom Financial Conduct Authority.

WisdomTree Ireland Limited and WisdomTree UK Limited are each referred to as "WisdomTree" (as applicable). Our Conflicts of Interest Policy and Inventory are available on request.

**For professional clients only. Past performance is not a reliable indicator of future performance. Any historical performance included in this document may be based on back testing. Back testing is the process of evaluating an investment strategy by applying it to historical data to simulate what the performance of such strategy would have been. Back tested performance is purely hypothetical and is provided in this document solely for informational purposes. Back tested data does not represent actual performance and should not be interpreted as an indication of actual or future performance. The value of any investment may be affected by exchange rate movements. Any decision to invest should be based on the information contained in the appropriate prospectus and affer seeking independent investment, tax and legal advice. These products may not be available in your market or suitable for you. The content of this document does not constitute investment advice nor an offer for sale nor a solicitation of an offer to buy any product or make any investment.**

An investment in exchange-traded products ("ETPs") is dependent on the performance of the underlying index, less costs, but it is not expected to match that performance precisely. ETPs involve numerous risks including among others, general market risks relating to the relevant underlying index, credit risks on the provider of index swaps utilised in the ETP, exchange rate risks, interest rate risks, inflationary risks, liquidity risks and legal and regulatory risks.

The information contained in this document is not, and under no circumstances is to be construed as, an advertisement or any other step in furtherance of a public offering of shares in the United States or any province or territory thereof, where none of the issuers or their products are authorised or registered for distribution and where no prospectus of any of the issuers has been filed with any securities commission or regulatory authority. No document or information in this document should be taken, transmitted or distributed (directly or indirectly) into the United States. None of the issuers, nor any securities issued by them, have been or will be registered under the United States Securities Act of 1933 or the Investment Company Act of 1940 or qualified under any applicable state securities statutes.

This document may contain independent market commentary prepared by WisdomTree based on publicly available information. Although WisdomTree endeavours to ensure the accuracy of the content in this

document, WisdomTree does not warrant or guarantee its accuracy or correctness. Any third party data providers used to source the information in this document make no warranties or representation of any kind relating to such data. Where WisdomTree has expressed its own opinions related to product or market activity, these views may change. Neither WisdomTree, nor any affiliate, nor any of their respective officers, directors, partners, or employees accepts any liability whatsoever for any direct or consequential loss arising from any use of this document or its contents.

This document may contain forward looking statements including statements regarding our belief or current expectations with regards to the performance of certain assets classes and/or sectors. Forward looking statements are subject to certain risks, uncertainties and assumptions. There can be no assurance that such statements will be accurate and actual results could differ materially from those anticipated in such statements. WisdomTree strongly recommends that you do not place undue reliance on these forward-looking statements.

**WisdomTree Commodity Securities Limited**

The products discussed in this document are issued by WisdomTree Commodity Securities Limited (the "Issuer"). The Issuer is regulated by the Jersey Financial Services Commission. Investors should read the prospectus of the Issuer before investing and should refer to the section of the prospectus entitled 'Risk Factors' for further details of risks associated with an

investment in the securities offered by the Issuer.

Securities issued by the Issuer are direct, limited recourse obligations of the relevant Issuer alone and are not obligations of or guaranteed by Citigroup Global Markets Limited (“CGML”), Citigroup Global Markets Holdings Inc. (“CGMH”), Merrill Lynch International ("MLI"), Bank of America Corporation ("BAC") or any of their affiliates. Each of CGML, CGMH, MLI and BAC disclaim all and any liability whether arising in tort, contract or otherwise which they might have in respect of this document or its contents otherwise arising in connection herewith.

“Bloomberg®” and the Bloomberg Commodity Index(es)SM referenced herein are service marks of Bloomberg Finance L.P. and its affiliates, including Bloomberg Index Services Limited (“BISL”), the administrator of the indices (collectively, “Bloomberg”) and have been licensed for use for certain purposes by WisdomTree UK Limited and its permitted affiliates including WisdomTree Commodity Securities Limited (together, WisdomTree). Bloomberg is not affiliated with WisdomTree, and Bloomberg does not approve, endorse, review, or recommend the exchange-traded product(s) referenced herein. Bloomberg does not guarantee the timeliness, accurateness, or completeness of any data or information relating to the index(es).

**WisdomTree Multi Asset Issuer**

WisdomTree Multi Asset Issuer PLC (the “Issuer”) issues products under a Prospectus (“WTMA Prospectus”) approved by the Central Bank of Ireland, drawn up in accordance with the Directive 2003/71/EC.

The WTMA Prospectus has been passported to various European jurisdictions including the UK, Italy and Germany and is available on this document.

**For Investors in Switzerland**

This document constitutes an advertisement of the financial product(s) mentioned herein.

In Switzerland, this communication is only targeted at Qualified Investors.

The prospectus and the key investor information documents (KID) are available from WisdomTree's website: **https:** //www.wisdomtree.eu/en-ch/resource-library/prospectus-and-regulatory-reports

**For Investors in Monaco**

This communication is only intended for duly registered banks and/or licensed portfolio management companies in Monaco. This communication must not be sent to the public in Monaco.