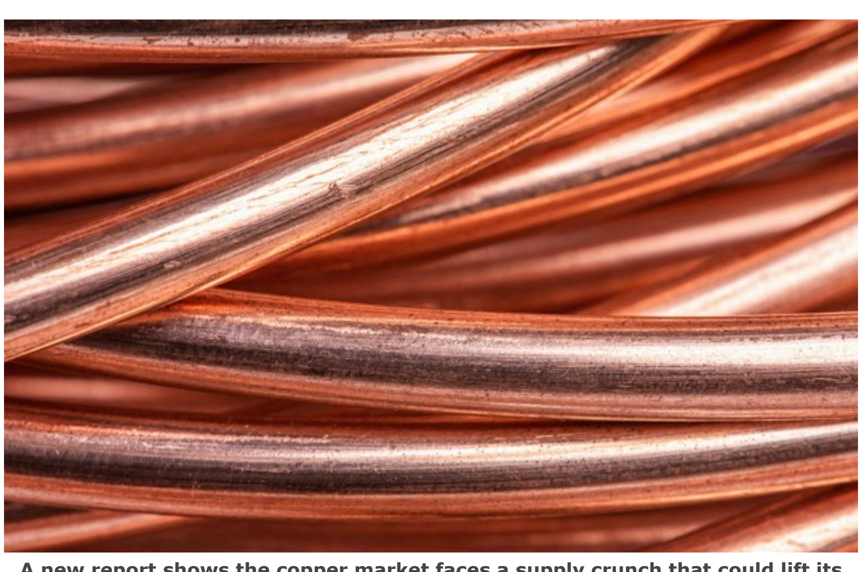
Copper to underpin renewable energy revolution, price set to hit $19,000/t by 2025

By **Imelda Cotton** - *April 20, 2021*



A new report shows the copper market faces a supply crunch that could lift its price by more than 60% in four years.

Global demand for copper is expected to soar to nearly US$15,000 per tonne (A$19,385/t) this decade, underpinned by a "critical role" the metal will play in achieving Paris Agreement climate change goals.

A report released last week by investment bank Goldman Sachs titled *Copper is the new oil* suggests the metal will be the most cost-effective option in the move towards capturing, storing and transporting renewable sources of energy.

It added that moving the global economy toward net zero emissions remains a core driver of the structural bull market in commodities demand, in which green metals such as copper are critical.

"Copper will be crucial in achieving decarbonisation and replacing oil with renewable energy sources," the report said.

"The market is facing a current supply crunch which could boost the commodity's price by more than 60% in four years."

Renewables revolution

Goldman believes copper will lead the way when it comes to the renewable energy revolution.

"Copper has the necessary physical properties to transform and transmit these sources of energy to their useful final state, such as moving a vehicle or heating a home," the bank said.

"By mid-decade, this growth in green demand alone will match, and then quickly surpass, the incremental demand China generated during the 2000s."

Research estimates that by 2030, copper demand from the transition to cleaner energy will grow nearly 600% to 5.4 million tonnes as a base case scenario and 900% to 8.7Mt in the case of a "hyper-adoption" (or rapid uptake) of green technologies.

Increased demand and likely low supply are set to drive the metal's price upwards from current levels of around US$9,000/t (A$11,630/t) to US$15,000/t (A$19,385/t).

Cost-effective metal

As a cost-effective metal, copper has the physical attributes needed for creating, storing and distributing clean energy from the wind, sun and geothermal sources.

It is already a key part of sustainable technologies including electric vehicle batteries and clean energy generation – markets which are expected to become stronger on the back of political and economic pushes as the deadline looms for the Paris Agreement international treaty on climate change.

By way of example, a standard electric vehicle currently has an average copper content of up to 83kg per car – four times higher than that of an internal combustion engine (ICE) vehicle, which averages up to 20kg of copper.

Copper is found inside the battery, motor coils, inverters and wiring.

The copper content inside the lithium-ion battery found in an electric vehicle ranges between 0.5kg per kilowatt-hour for a nickel-cobalt-aluminum oxide (NCA) battery type to 0.7kg/kWh for a NMC-811 (nickel-manganese-cobalt) type.

The remaining vehicle components – mainly the electric motor and the wiring system, which carries current to the electronic parts of the car – account for around 40kg per unit of copper.

Copper is also a crucial component for electric vehicle infrastructure and is required for the cabling of charging poles, with the metal's intensity ranging from 2kg for an AC level 1 charger, through to 25kg for a DC fast-charger.

Maximising the efficiency and performance of photo-voltaic panels using copper is believed to be the second driver of green demand after electric vehicles.

US infrastructure package

Earlier this month, United States president Joe Biden announced the US$2 trillion American Jobs Plan designed to overhaul the nation's economy by encouraging green energy technologies and new infrastructure projects.

Mr Biden said the plan would enable drivers across the country to find electric charging stations for their vehicles on the road, replace every lead pipe in the country, and give all Americans access to high-speed internet by the end of the decade.

In order to achieve this, new copper projects would be needed to inflate global supply; however, Goldman Sachs believes there has not been enough of a focus on this so far.

"In its current state, the copper market is not prepared for a demand environment – while the price has risen about 80% in the past year, it has not been matched by the prospect of increased supply from material greenfield project approvals," the bank said.

"The market is already tight as pandemic stimulus (particularly in China) has supported a resurgence in demand, set against stagnant supply conditions."

Coronavirus has compounded the dynamic, creating enough uncertainty to freeze corporate investment decisions and help bring the market the "closest it's ever been" to peak supply.

National security issue

Ivanhoe Mines (TSE: IVN) founder Robert Friedland echoed Goldman's sentiment to delegates at last week's virtual World Copper Conference, labelling the supply of copper a "national security issue".

The billionaire placed importance on the sustainable mining of copper for the new world economy, citing his company's mega Kamoa-Kakula project in the Katanga province in the Democratic Republic of Congo.

"We are just scratching the surface of what we think is actually there," he said.

"We are going to grow it as sustainably as we can at the right rate of speed… we are at the bottom of the world's cost curve and we are mining sustainable copper, so we are a part of the solution, not part of the problem."

At the 2019 Mines and Money London conference, Mr Friedland spoke of rising global copper demands, predicting electric vehicles would be a huge opportunity for his company, the mining industry and investors.

"The demand is going to be psychedelic and fuelled by a rise in electric vehicle production and sales," he said at the time.

A boom in consumer electronics, increased use of renewable energy sources and energy efficiency – coupled with the need for battery storage solutions – would also require significant amounts of the red metal.

"Copper is rare and hard to find, but without it we could not have a modern world," Mr Friedland said.

Long-cycle commodity

Copper is a predominantly 'long-cycle commodity', meaning it can take up to four years to extend an existing mine and as long as eight years to establish a new greenfield project.

Goldman Sachs' report said the long lead time to supply, combined with the mining industry's resistance towards new capital expenditure, would leave the copper market desperate to secure the quantities needed to meet demand in the second half of the decade.

"Copper prices must rise now to incentivise enough supply to solve prospective deficits, or risk chronic scarcity pricing," the report said.

"The immediate conclusion is that current prices (at US$9,000/t) are too low to prevent a near-term risk of inventory depletion, while our current long-term price (US$8,200/t) is not high enough to incentivise enough greenfield projects to solve the long-term gap.

"If copper remains at US$9,000/t through the next two years, we estimate the resultant deficits would generate a depletion of market inventories by early 2023."

Based on scrap and demand modelling, the bank said the most probable path for copper pricing which "avoids depletion risk and sharpens surplus swing" would be a trend into the mid-teens by 2025.

Not all gloom and doom

The copper supply scenario is not all gloom and doom though, with Goldman Sachs confirming there was not yet an absolute shortage of copper deposits.

Rather, the situation reflects the mining sector's focus on "de-leveraging and balance sheet conservatism" after the metal's price collapse of 2014-15.

This came after a surge in supply investment following the copper price rally of 2010-11.

"Committed copper-related growth capex is on a downward path from 2021 [and] there has been no indication of a pivot towards growth yet from the mining sector, despite the stronger copper price environment," the bank said.

"Given the long lead times [for extending and establishing] copper projects, we would note that the earliest mine level responses can emerge is into mid-decade [and] given the size of deficits starting from the same point, the approvals and investments in mine projects have to start now."

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Imelda Cotton has over 25 years experience as a journalist and communications professional. She has spent the bulk of her career in the resources sector, having also worked directly with oil and gas majors and as a journalist covering a vast array of ASX listed companies within the resources, energy, science and health sectors.

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