NICKEL AND COPPER: BUILDING BLOCKS FOR A GREENER FUTURE

Wood Mackenzie – Wood Mackenzie
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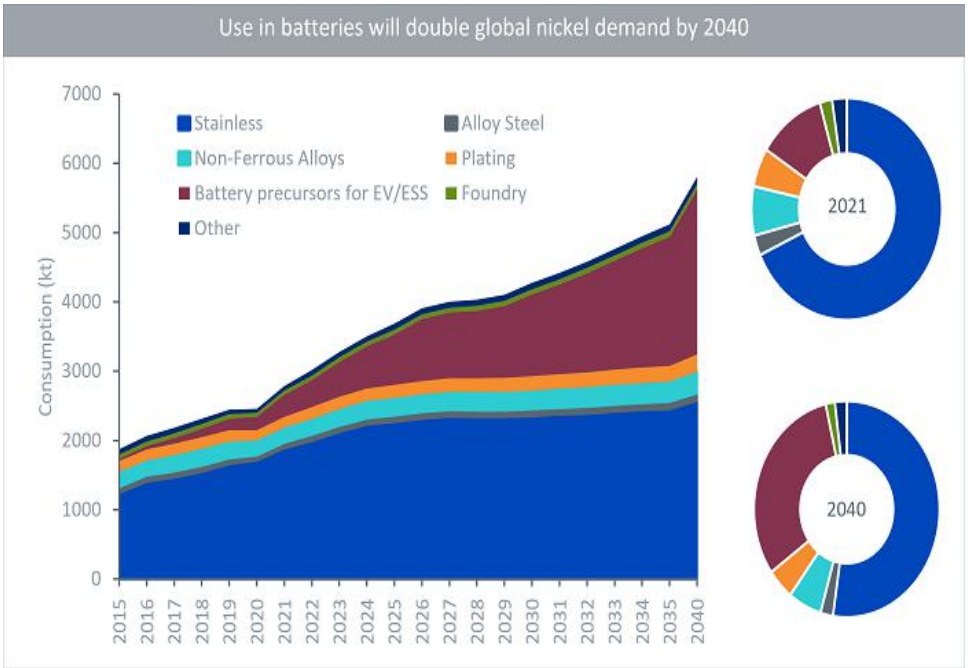
Both nickel and copper possess properties that give them a central role in the drive for a greener future. While demand from the prevailing end-uses will continue to grow steadily, electric vehicle (EV) and energy storage applications will underpin a huge increase in long-term demand.

There are significant challenges for the industry to overcome to increase supply of nickel and copper in the coming years. These challenges are likely to require innovative solutions to bridge supply gaps and keep the costs to established and emerging end uses down.

Global nickel demand growth: the future is batteries

While stainless steel will continue to be the main first use for nickel, the major engine of demand growth over the next two decades will be batteries. From only 7% of the total market in 2021, we expect battery use to grow to 40% of nickel consumption by 2040. That will push nickel demand to double in size from current levels to six million tonnes per year by 2040.

Industry expectations for nickel use in batteries have increased over the last year, mainly due to greater net zero commitments from governments and automakers. The increasing importance of energy storage to enable wider use of renewables will also be an important factor in driving demand.



Source: Wood Mackenzie, 2022.

Forecasts are not an indicator of future performance and any investments are subject to risks and uncertainties.

Supplying the nickel required will be challenging in an Environmental, Social & Governance (ESG)-constrained world

Our current forecast indicates the need for an additional 1.65 million tonnes of nickel to be brought into production between 2026 and 2038. Given that an additional 1.8 million tonnes of nickel will have been brought online between 2011 and 2023, that ought to be feasible.

However, the vast majority of new capacity development over the past decade has been in Indonesia and has had significant environmental side effects. Recent pledges by Indonesia to reverse deforestation and cease coal-fired power station development would make repeating these growth rates extremely challenging.

The time taken to develop a nickel project, secure finance, build the plant and ramp it up, is typically been eight to ten years (at least outside Indo-China developments). Therefore, if the market is going to get the nickel it needs, investment and development in these projects needs to be underway now.

Regionality and legislation will drive nickel recycling

There is a growing focus on using locally-produced raw materials in Europe and the US. However, the lack of new project development for nickel mining outside Asia means battery manufacturers will need to turn to recycling to plug the gap.

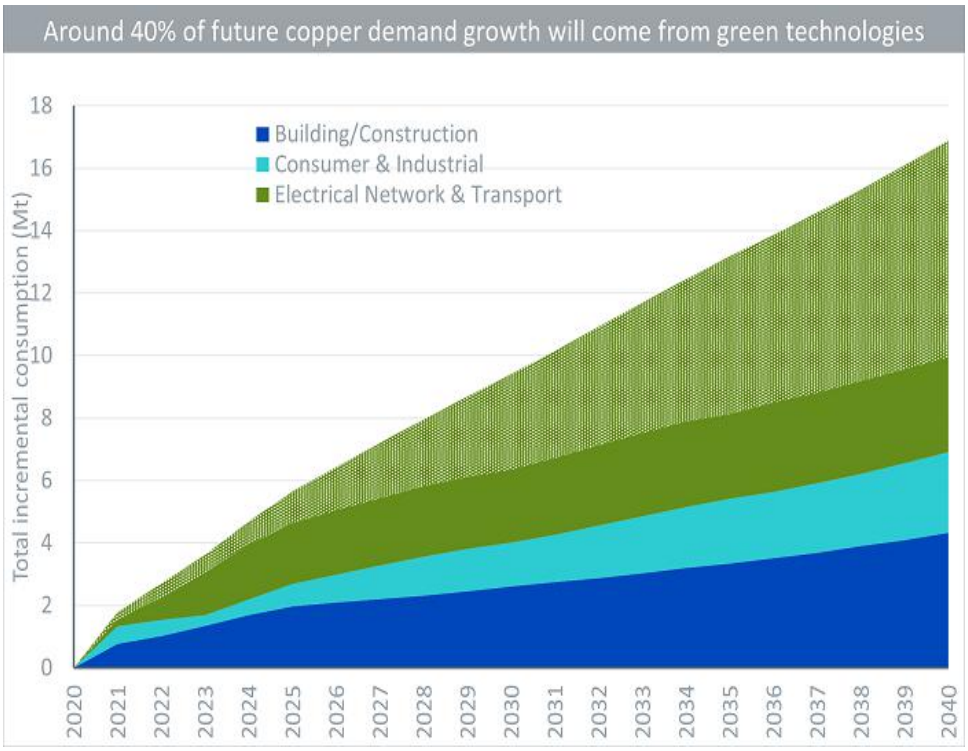
US battery recyclers are setting up plants close to cell scrap generation. However, government initiatives and legislation will be needed to support recycling and really drive it forward.

Wood Mackenzie's projection is that 20% of nickel demand for EVs (420,000 tonnes) will be recovered from EV recycling by 2040.

Copper: a traditional metal finds significant new uses

Humans have used copper for thousands of years, both for its aesthetic qualities and for its malleability, heat transfer and antibacterial properties. But it is the red metal's abilities as an electrical conductor that will be the main driver of increased demand over the next 20 years and beyond.

We expect 40% of future demand growth to come from electrical applications in green technologies, including EVs, offshore wind and solar.



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Copper: why the red metal is a green solution

Copper's green credentials aren't limited to its role in low-carbon end uses. The carbon intensity to produce finished copper is just a quarter that of aluminium due to being less energy-intensive.

What's more, a large proportion of planned copper mining projects globally intend to use low carbon intensity power sources. For example, in the Copperbelt of Zambia and the Democratic Republic of Congo, power comes almost exclusively from hydro. Meanwhile, in Chile up to 50% of power used is hydro, wind or solar, with over 90% of new capacity set to be renewable.

Copper and aluminium are interchangeable in many use cases, so the lower tax burden for more carbon-efficient copper could make it extremely attractive on a like-for-like basis.

Future copper requirements will be partly met by scrap

While its ESG profile is good for future copper demand, the current pool of around 2.5 million tonnes of advanced mining projects is smaller than a decade ago. This will create a 10-year supply gap of up to five million tonnes to 2031.

Developing mines is not getting any easier for a number of reasons. There is a lack of sizeable, well-advanced projects in low-risk jurisdictions which are ready to be green-lighted with high confidence of delivery. In addition, ESG measures have gone from being a 'nice to have' to an essential requirement, extending project lead times and risks.

As with nickel, given the rapid scaling of demand we expect much of the future requirement for copper will need to be met through recycling. There are signs of significant investment in new processing capability in North America and Europe as well as Asia. That gives us confidence that as much as six million tonnes of the 16 million tonnes of additional total copper demand over the next 20 years will be met by recycled feedstock.

Innovative solutions needed to increase supply

Nickel and copper are critical for the energy transition. Boosting supply will be key for both metals and it's clear that the industry will need to adapt to bridge looming supply gaps.

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