CIBC ASSET MANAGEMENT

Copper crunch: Data centres, AI and the new supply squeeze

STRATEGIC OPPORTUNITY FOR LONG-TERM INVESTORS

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Key takeaways:

- While the trajectory of AI uptake remains fluid, investing in copper provides a means to sustainably benefit from the upside while hedging against the uncertainty.
- Data centers (DC) represent an inelastic demand source that will drive up prices.
- Copper markets were headed towards a deficit even prior to DC demand. AI/DC demand pulls this deficit forward and amplifies it.
- At the same time, copper availability is setting-up to be a major bottleneck for AI/DC growth.
- Scarcity is likely to prompt substitution. Aluminum will be a second order beneficiary of DC load growth.

Through the end of the decade, demand for data centres (DC) is projected to grow 3.5x. Up to 219 GW of new capacity is estimated to come online over the next five years, skewed towards AI workloads[1] (71%). Much of the focus to date has been on the implications for power demand and the energy mix. Data centres are power hungry, prompting a slew of deals among energy, utilities and technology companies. DCs are projected to consume an additional 2,200 TWh of electricity by 2035 – this is tantamount to installing the entire current generation capacity of India or ~2.5x that of Japan.

While there is broad consensus around the trajectory of power demand, we consider the implications for something more fundamental – Copper. The next few years we believe, are likely to see an increasing call on copper from a structurally-inelastic demand source (DCs), that could drive up prices and potentially hamstring regular economic development (including energy transition-related electrification) due to scarcity. As the supply-demand imbalance comes into full view, higher copper prices will be needed to incentivize new development. Aluminum stands to directly benefit from this scarcity by replacing copper in growth driving, development projects.

The Cu- DC dynamic: a critical opportunity for long-term investors

Copper (its element symbol being Cu) is extensively used within data centres, from electrical cables and busbars to connectors, distribution strips and heat exchangers. Every MW requires approximately 27 tons[2] of copper which, implies **5.9 Mt of incremental direct demand from DCs through 2030**. For context, this amounts to the combined annual production of the top 5 producers globally. Despite its ubiquity, copper represents less than 0.5% of the overall project cost of a data centre[3]. **As such, well capitalised developers like hyperscalers are insensitive to the price of the metal**.

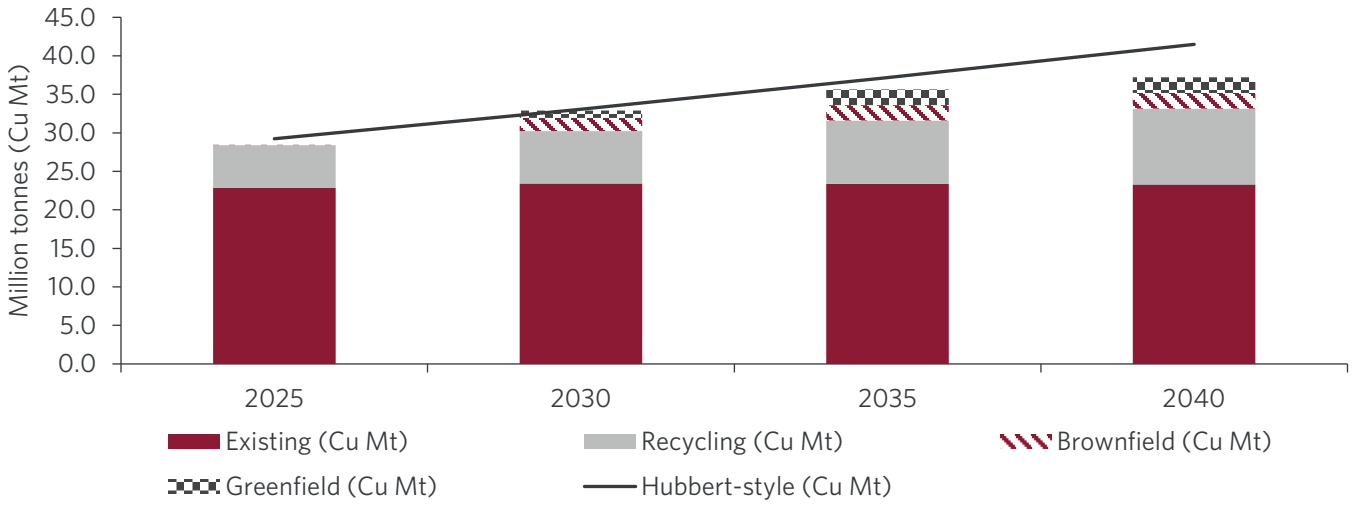
Enabling infrastructure for data centre-related load growth presents an additional source of copper demand. Wood Mackenzie estimates that 1.1 Mtpa of copper will be needed towards grid infrastructure to support data centres by 2030[4]. The exact outturn demand will be a function of generation (behind-the-meter vs. utility scale), technology and siting. Nonetheless, **transmission alone could present a cumulative call on copper north of 5 Mt.**

The deficit amplified: Current price far below forecast market clearing price

The question that follows is whether supply can service this ballooning demand. We explore this by combining top-down third-party modelling with bottom-up mapping of major mines, brownfield expansions and greenfield development. We map 65% of current global output, covering all major mines. The remaining 35% production from State owned (with the exception of Codelco) and smaller mines where copper is a byproduct, is kept constant at 2024 levels. To create a time series, we include capacity additions from brownfield and greenfield development where expected production and timelines are disclosed.

Based on current production, sanctioned brownfield and greenfield pipeline, and our recycling assumptions[5], we find that total copper supply is likely to remain below a Hubbert[6]-style steady-state extrapolation level through 2040 (Figure 1). Essentially, actual copper production growth is set to fall well behind levels we would expect from historical trends and steady operations. This underscores the challenges related to ageing mines, declining production as well as insufficient investment in primary capacity.

Figure 1. Copper production - bottom-up mapping vs. Hubbert-style steady state level



Source: CIBC Asset Management based on internal research and third party estimates.

Copper is closely tied to general economic growth and the rise of the middle class:

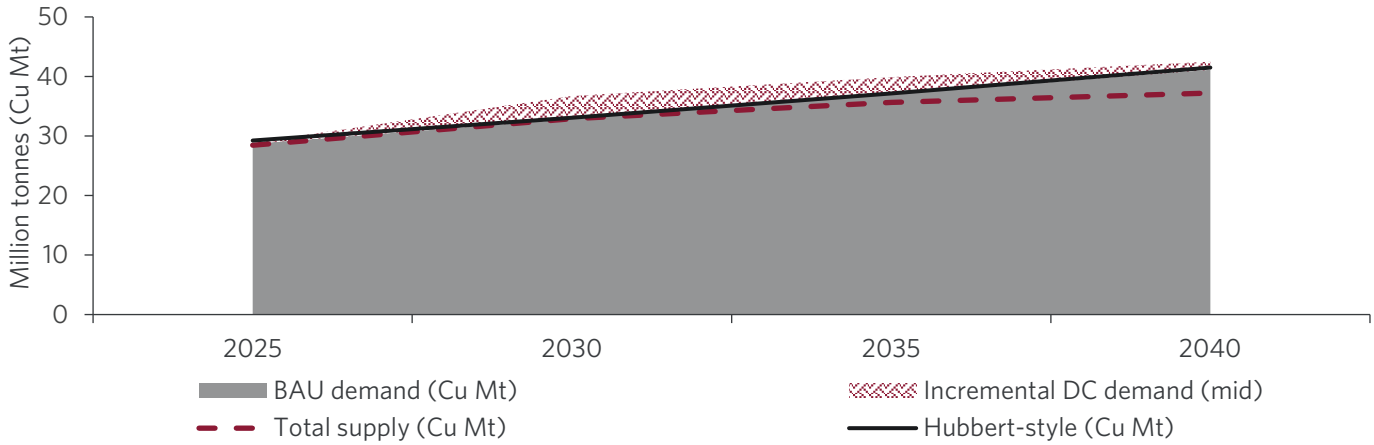
Baseline uses for copper

- Electrical wiring
- Electronics
- Renewable energy
- Plumbing
- Roofing and gutters
- Alloys
- Transportation
- Medical

The next step is to compare the supply with projected demand. We rely on academic research for baseline economic demand[7] (BAU demand). We add to that our estimate of incremental DC-related copper requirement, based on a range of industry forecasts for DC installed capacity in 2030 and an extrapolation of energy consumption estimates from the IEA.

Our estimates reveal supply lagging demand by 9% through 2040 on average (Figure 2). This is conditional on current prices and state of development, permitting timelines and mining methods. We also identify 1.95Mt of potential greenfield supply in various stages of assessment, with no timelines ascribed. This additional output, should it come on-line, could narrow the deficit to ~4%. As we explain later in this paper, a deficit of 4-9% is enough to significantly affect the market clearing price for copper.

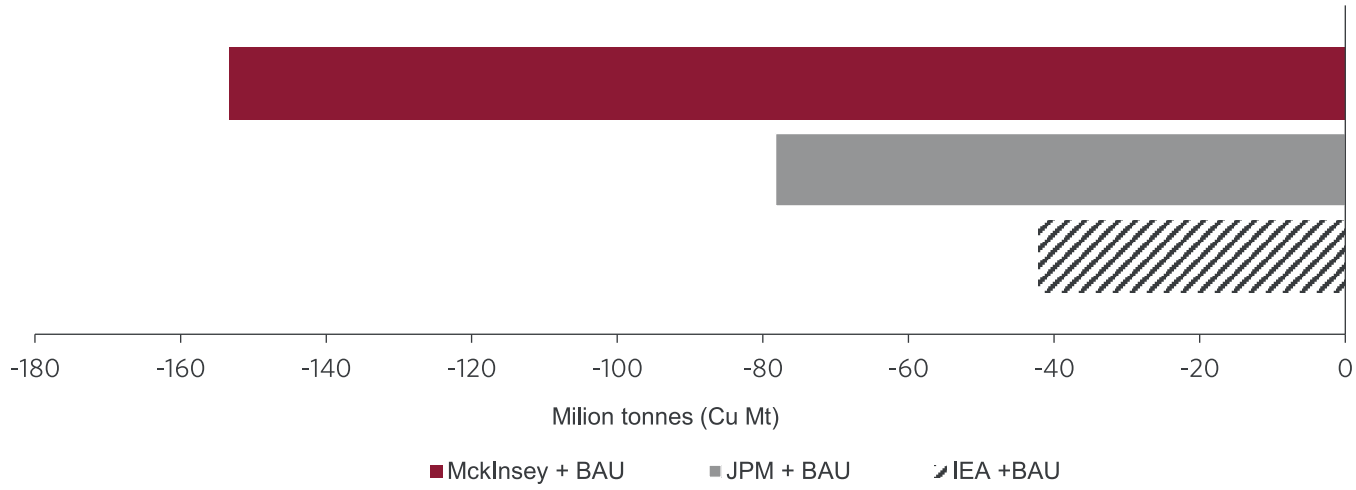
Figure 2. Copper demand-supply 2025-2040



Source: CIBC Asset Management based on internal research and third party estimates

Homing in on the near-term (2030), a range of third-party estimates reinforces the message (Figure 3). **Copper supply, as it stands today, will be a major bottleneck to realizing the forecast around data centres and AI**.

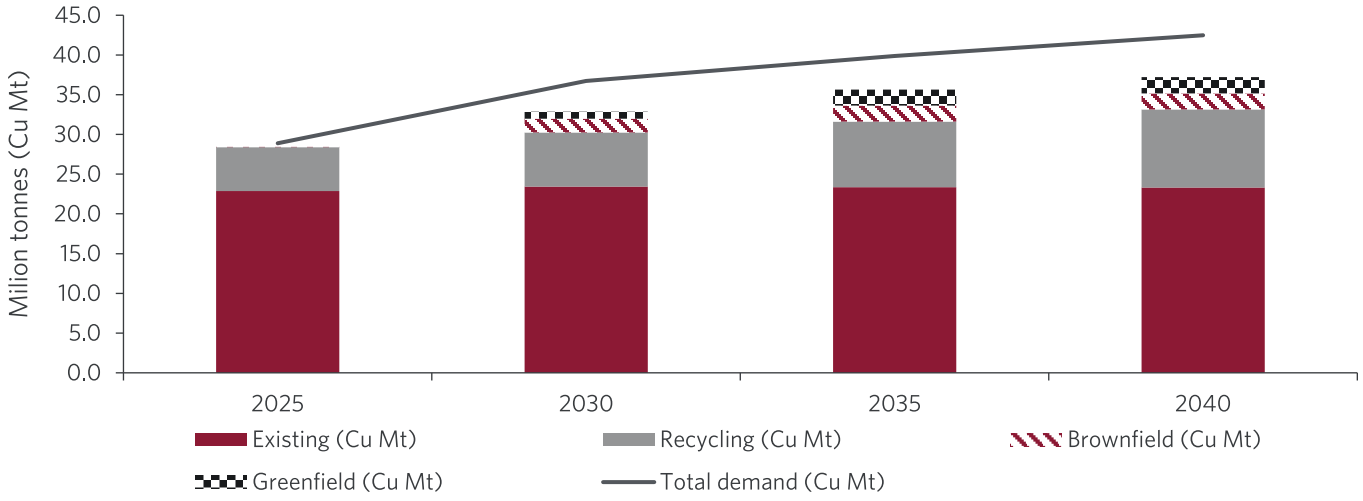
Figure 3. Copper supply shortfall (Cu Mt) in 2030 under different DC growth scenarios



Source: CIBC Asset Management based on internal research and third party estimates.

Faster reserve growth and/or breakthroughs in extraction methods will be required to erase or narrow this gap. This is a tall order given development timelines for new copper mines and declining grades in existing ones. Instead, inability to grow production will drive higher prices. Capital intensity of recent projects [8] points to an incentive price much higher than current copper prices. Some literature suggests that future copper price must exceed $20,000/ton for significant new mines to be economically viable and worth putting into production[9]. By contrast, over the last 5 years LME copper price has averaged a little over $9,000/ton. While we don't attempt to predict a specific incentive price, the underlying message is clear – **copper fundamentals demand and will dictate significantly higher prices.**

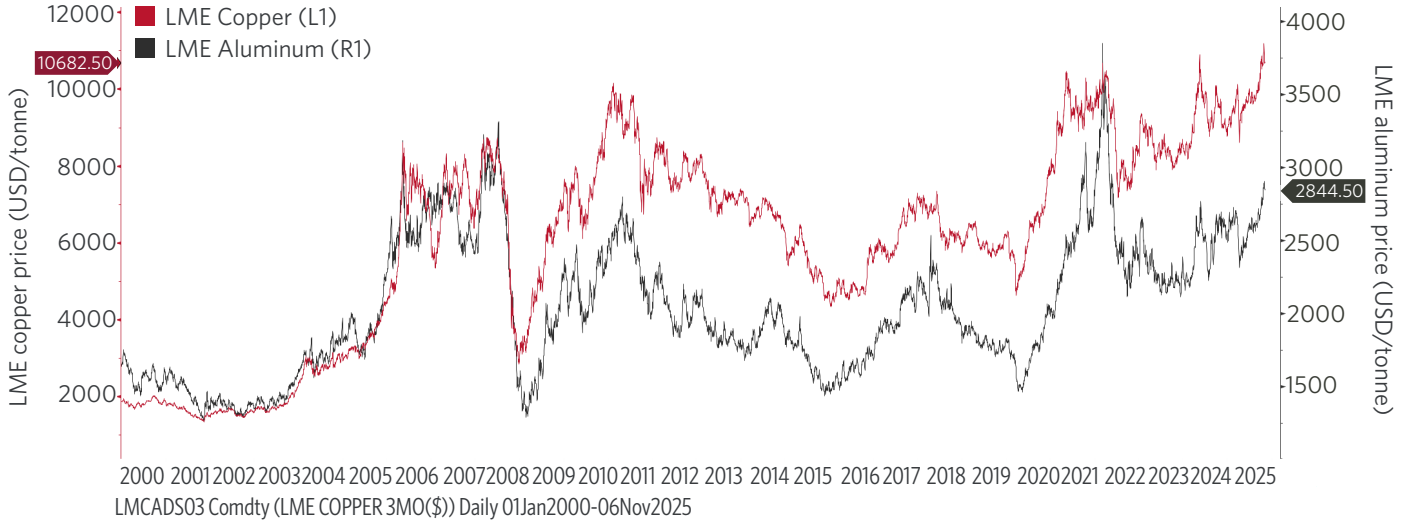
Figure 4. Copper balances- deficit likely in full view by 2030, pulled forward by DC growth



Source: CIBC Asset Management based on internal research and third party estimates

Aluminum: The second order play

A corollary of the above is a substitution effect. The dynamic of scarcity and rising prices, though may cause some temporary demand destruction, is likely to encourage substitution away from copper. Aluminum, with ~60% of copper's conductivity at ~30% of the cost, is a prime candidate to replace copper[10] in transmission and other electrical applications (busbars, cabling, transformer windings etc.). The historical experience demonstrates aluminum's parallel price performance during periods of high copper demand: From the Chinese super-cycle between 2003-2006, to the GFC stimulus boom (2009-2011) and post pandemic rebound, periods of copper deficit have propped aluminum demand. As such, we propose that **aluminum producers could be second-order beneficiaries of the boom in data centre-related demand growth.**



Source: Bloomberg, as of November 7, 2025.

Copper deficit amplified by, but not dependent on, AI buildout

With billions being spent on data centres without a commensurate ROI (yet), there is increasing concern around market exuberance. We don't seek to litigate DC projections in this paper, primarily because **our thesis is not contingent upon DC/AI build out.** We are faced with copper deficits even for regular economic development (Figure 2). **AI/DC demand pulls this deficit forward and amplifies it rather than causing it.** As circular financing and concerns around overbuild provide pause for reflection, we argue that even the more conservative estimates of DC build-out would exert pressure on prices due to inelasticity.

We view copper as a constraining factor and a first-order beneficiary of the AI theme. The lofty DC forecasts need not fully materialise for the metal to rally. The case for copper investing is supported by a bevy of secular themes beyond artificial intelligence. These include, but are not limited to, rising military spending, electrification and India's economic development (albeit over the medium to long-term)[11]. CIBC Asset Management Global Research forecasts global GDP growth in the area of 3.2% pointing to continued positive momentum for copper. We anticipate that demand for the metal will exceed its traditional correlation with global growth. As such, rising demand and tightening supply lay out a clear path for prices.

Accessing the opportunity

Given this backdrop, CIBC Global Asset Management's Credit Research Team is on the lookout for opportunities that are poised to benefit from this set-up. Our fundamental screen balances high asset quality, low cash cost, operational stability and organic growth potential.

Names we like in the investment-grade space include Glencore, Southern Copper and Antofagasta. First Quantum screens well among high-yield peers while we view Ivanhoe as a high-risk/high reward opportunity. In terms of jurisdictions, we find the Americas account for 88% of additional output through 2040, led by Chile, Peru and Argentina.

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[1] https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/the-cost-of-compute-a-7-trillion-dollar-race-to-scale-data-centers

[2] Copper content is higher based on data-centre architecture. AI training clusters for instance, use denser racks with higher copper content per MW (40-60t/MW) as do Tier IV facilities and N2 redundancy requirements. For the purpose of this piece we use a conservative estimate.

[3] A sudden surge in construction could therefore trigger price spikes of 15% or more, rapidly depleting inventories and intensifying volatility.

[4] https://www.woodmac.com/press-releases/soaring-copper-demand-an-obstacle-to-future-growth/

[5] We model recycling increase through 2040. As copper price rises, recycling and scrap availability will likely pick up thereby adding copper supply and helping partially reduce the deficit.

[6] The Hubbert curve assumes a finite ultimately recoverable resource and steady techno-economic conditions (extraction methods, prices, policy, recycling), using historical production to fit a logistic path; it's an illustrative baseline under stable assumptions, not a floor.

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[8] https://www.bhp.com/news/bhp-insights/2024/09/how-copper-will-shape-our-future

[9] https://pubs.geoscienceworld.org/segweb/segdiscovery/article/doi/10.5382/SEGnews.2025-141.fea-01/654182/Copper-Mining-Development-and-Electrification

[10] Aluminum is a prime though not a perfect substitute for copper. It can replace copper in some cases, but differences in conductivity, strength, corrosion resistance and reliability mean that copper remains essential for many critical applications. Substitution is often a trade-off between cost, performance and strength. Having said that, Aluminum is still the closest substitute to copper for electrical and industrial applications and a direct beneficiary of copper scarcity.

[11] https://www.renaissanceinvestments.ca/sites/default/files/rep/downloads/marketing/renaissance/misc/Inflation-and-commodities.pdf

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