Rio Tinto

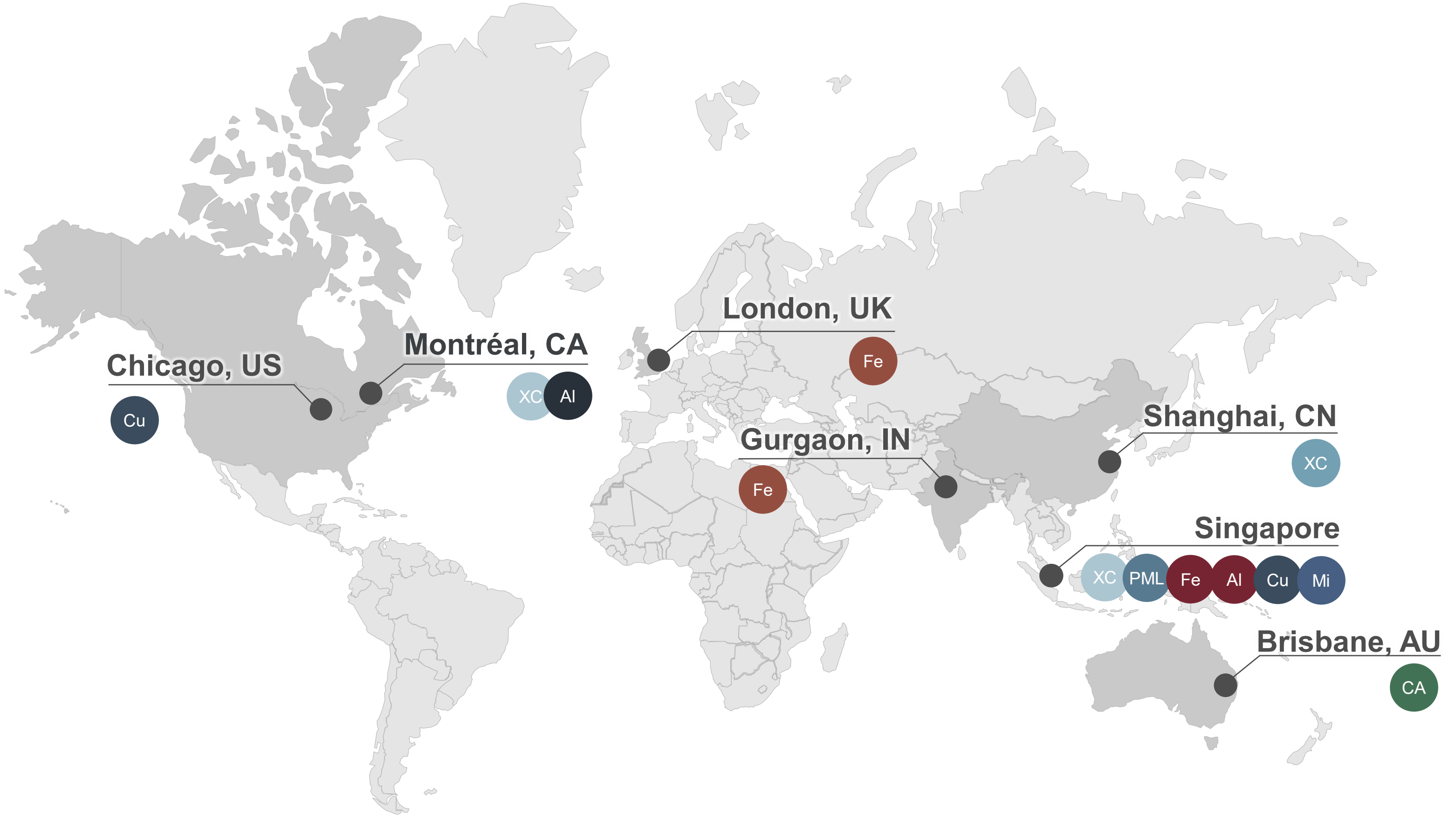
Market Analysis

LME Week 2022

Will Millsteed

Head of Market Analysis

Rio Tinto Market Analysis



XC Cross-commodity

PML Procurement, Marine, Logistics

Fe Iron Ore & Steel

Al Aluminium & raw materials

Cu Copper & by-products

Mi Minerals

CA Competitor Analysis

- The Market Analysis team convert insight into action – more cash or less risk
- Embedded with our Commercial Sell, Buy and Move teams globally
- Diverse backgrounds with extensive networks and experience
- A culture of collaboration and excellence – it’s all about sustainably getting the best result for Rio Tinto, our partners and stakeholders

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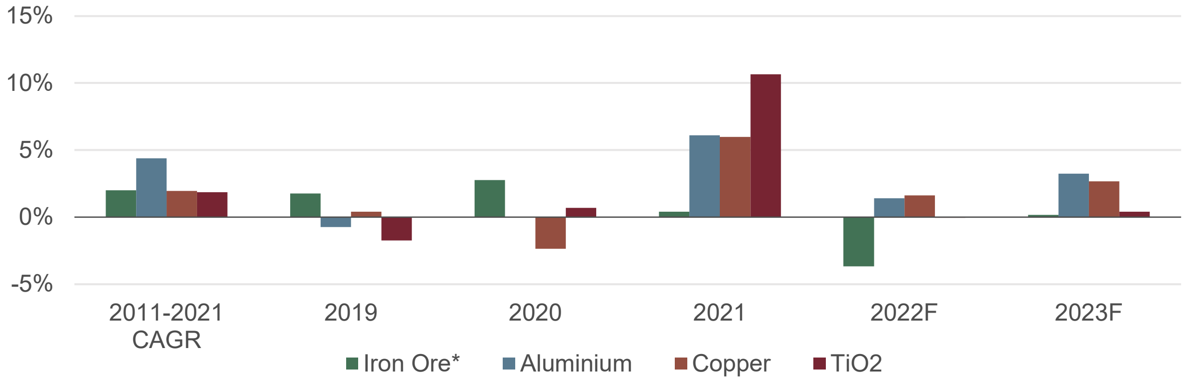
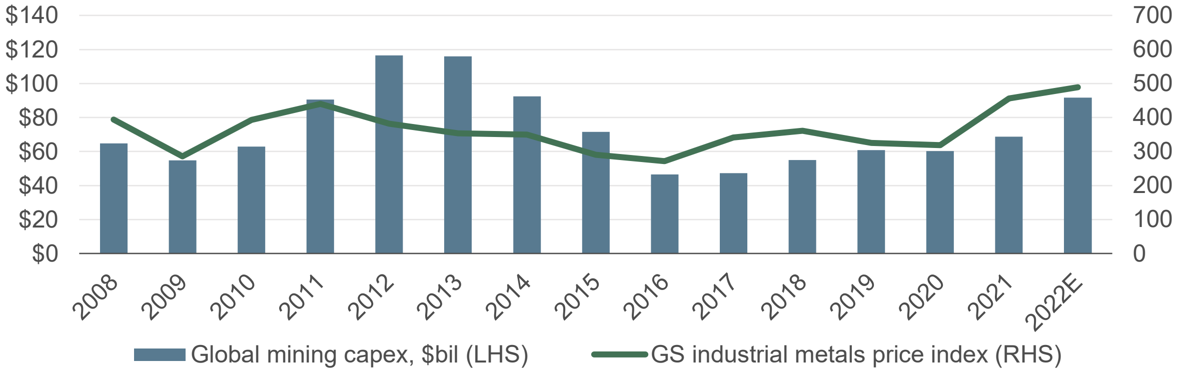
Prices to remain volatile amidst economic uncertainty

Annual commodity demand (YoY%)



*Iron ore demand data available from 2012. CAGR calculated from 2012 - 2021

Metals capex vs commodity price index

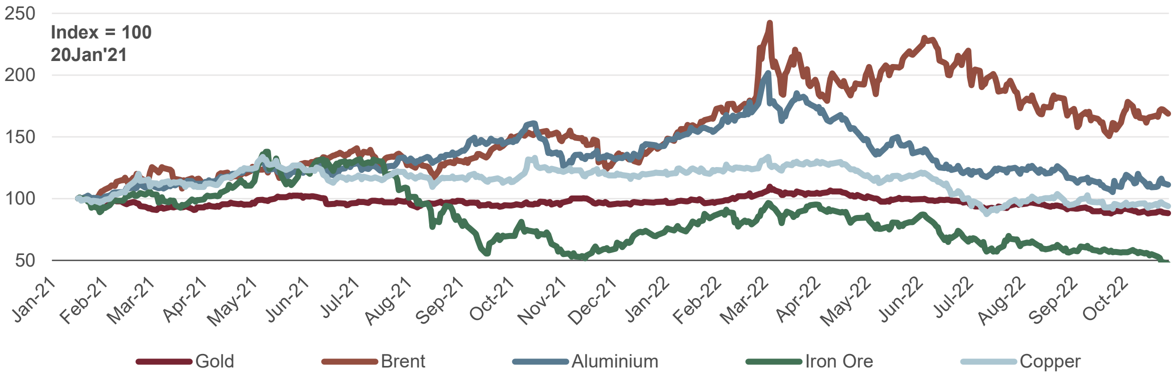


Source: RT Market Analysis, Bloomberg

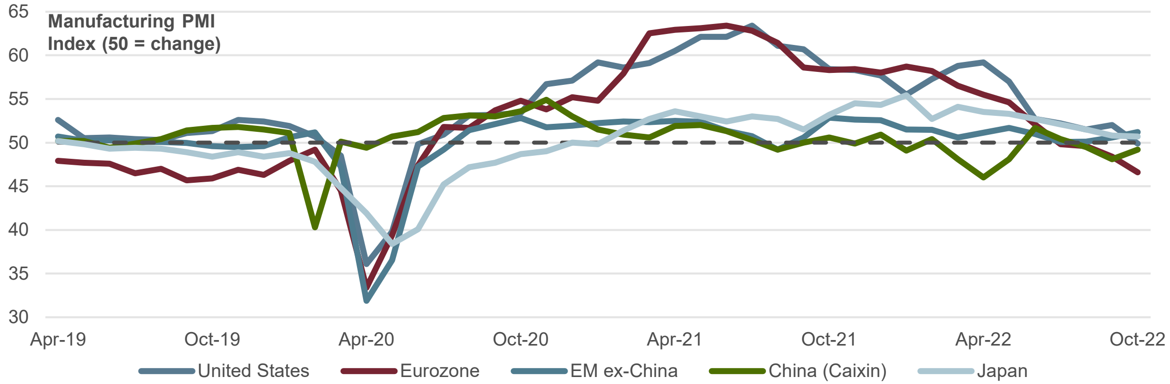
- Strong rebound for most metals in 2021 and in 1H22; 2H22 and outlook 2023 has softened given weaker global economic outlook.
- Mining industry capex for 2022 revised upwards by 4% compared to Jan’22. However, still more restrained than previous cycle.
- Metal prices expected to remain volatile given growing recession fears, but supported by low inventories.

Commodity prices easing as economic outlook weakened

Recent key commodity price performance
(indexed to Jan 2021)



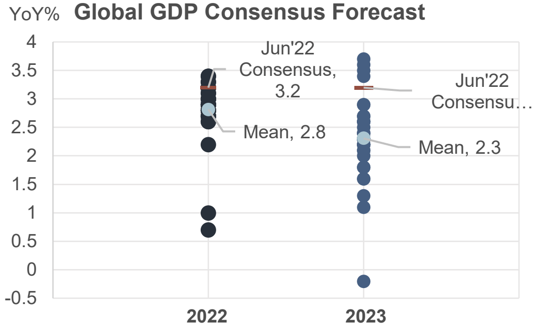
Factory output slow down across major economies

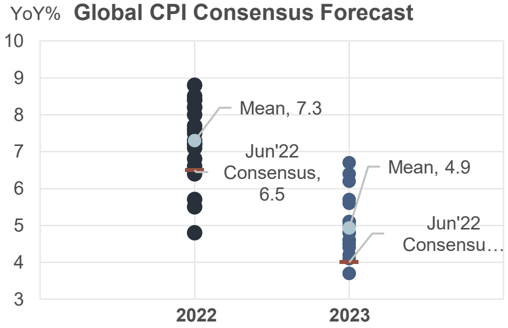


Source: RT Market Analysis, Bloomberg, Oxford Economics

- **Demand poses downside risk** as the global economy slows.
  - Energy security remains a key risk amidst protracted war
  - Aggressive interest rate hikes in the US and Europe
- **China's GDP growth uneven across sectors.**
  - Recovery led by infrastructure, auto (EV) and exports
  - Constrained by continued pandemic disruptions and housing market weakness – but there is potential sequential upside from here
- **Recessionary risks higher for next year.**
  - Monetary policy tightens further on persistent inflation.

More downgrades to macro indicators
– large range of views





* Consensus forecasts as at 24 October 2022

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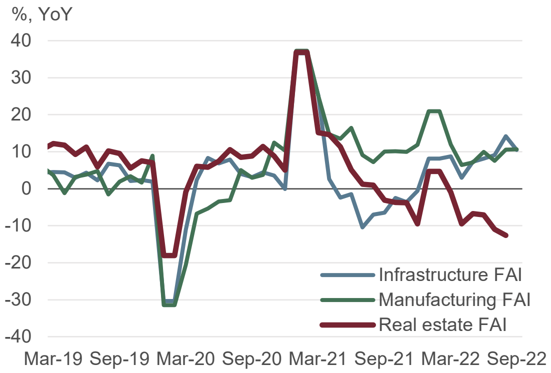
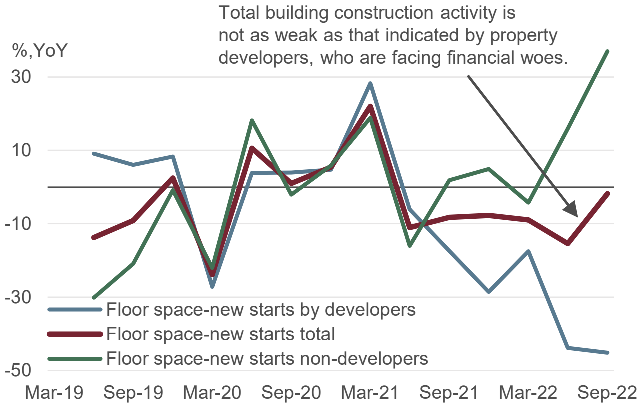
China steps up measures to stabilise growth

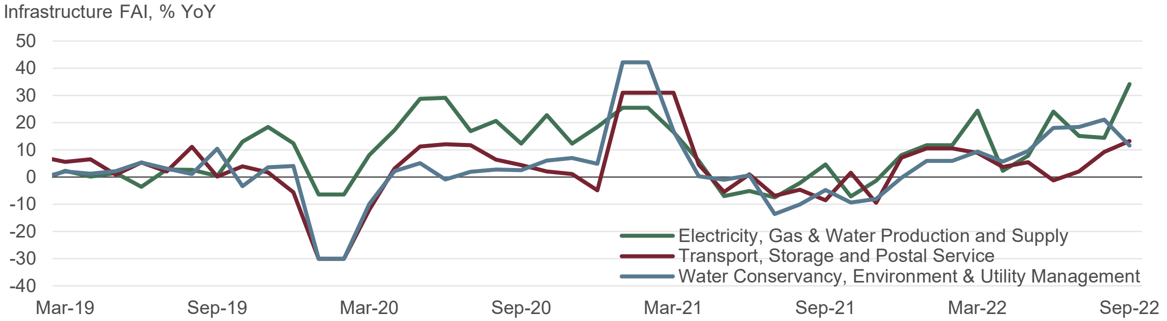
Property slowdown offset by infrastructure and manufacturing growth



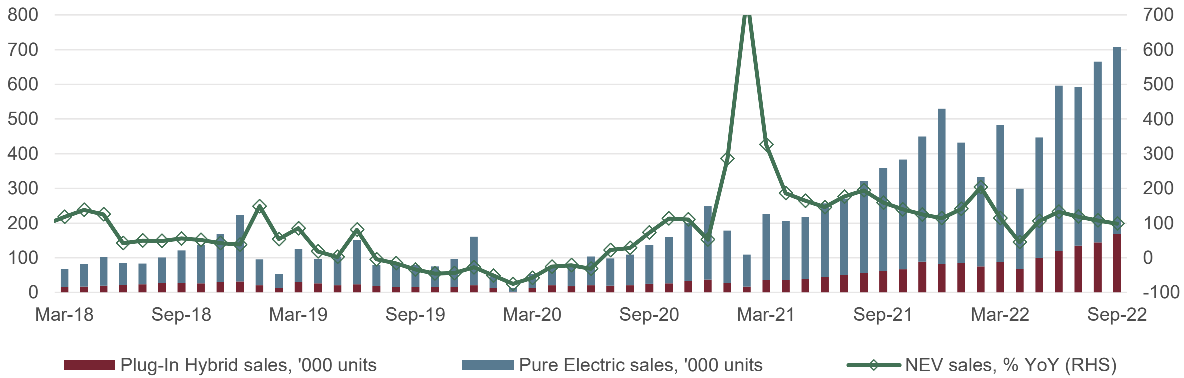


- **Increased policy support** to stabilise the economy and restore confidence
  - Lower lending rate
  - Increase liquidity to construction sector
  - Infrastructure investment
- **Key challenges:**
  - Covid breakouts and associated lockdowns
  - Seasonal energy shortages
  - A weak property market
  - Capital outflow and depreciation of CNY

Infrastructure investment growth broad-based and supported by policy



Auto output has been supported by strong EV sales



Sources: RT Market Analysis, CEIC

*Buildings that are not constructed by developers consists of social housing, factory, warehouse, hospitals, schools, social wellbeing facilities, hotels, etc. Non-developers account for about 60% of overall building construction.

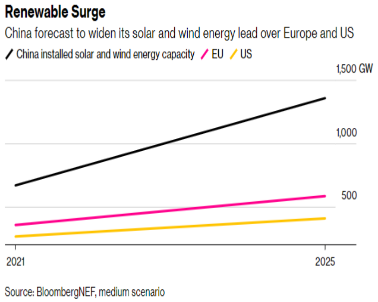
China focused on five main infrastructure pillars

Renewable energy

New projects mainly located in deserts in western China.

Construction at wind and solar bases kicked off in recent months.

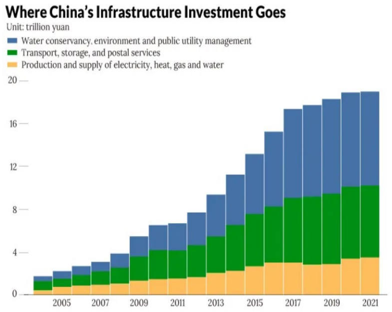
By 2030, China's renewable capacity is expected to grow to be comparable to the size of the whole Europe.



Water conservancy

Investment will likely reach CNY 800bn in 2022 after construction of canals, dams and reservoirs stepped up.

The most ambitious is a 200km tunnel moving water from the Yangtze river to a reservoir that feeds northern China, a scheme known as the South-North Water Transfer Project. This will be the world's longest water tunnel.



Urban infrastructure

Projects include urban roads, gas and water pipe networks and parks which not only help link cities together but also improve the ecology of the city clusters.

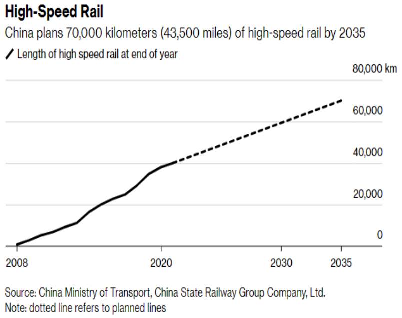
An example is 'Songya Lake Ecological New city' in central China and industrial parks (1/3 of infrastructure bond proceeds in 1Q).

High-speed rail

On top of existing 40,000km, another 30,000km planned by 2035.

The annual mileage to be constructed is actually 40% lower than the average in the past five years.

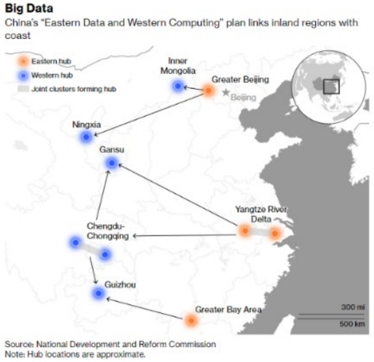
Among these projects is a 1,629 km line from the southwestern Sichuan to Tibet by 2030. Total cost is estimated at CNY 320bn.



Mega data centres

The 'Eastern Data Western Computing' plan involves building huge data centres in poorer Western provinces to hold data generated by internet companies based in the east.

Building eight data centre clusters will cost CNY 400bn per year — most of which will come from state-owned telecoms companies.



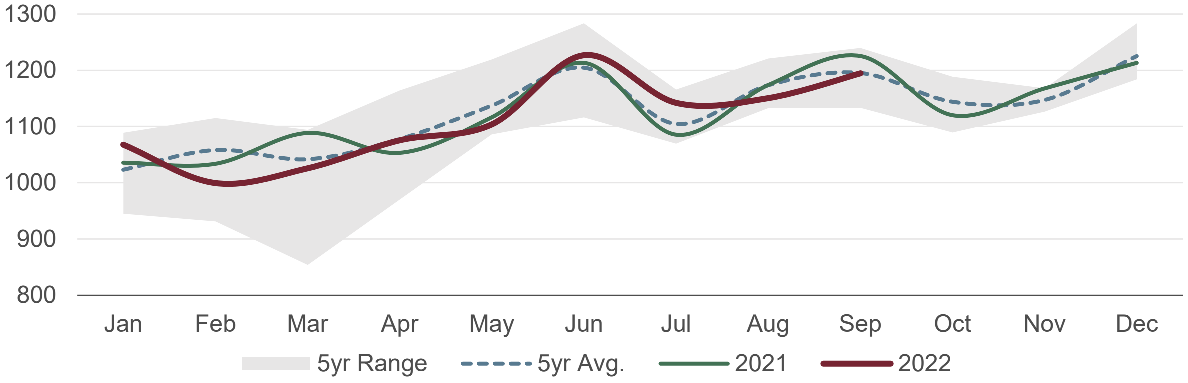
Sources: Bloomberg, Government of China, Chinese Academy of Social Sciences, RT Market Analysis

New infrastructure focus areas above, given the shift away from bridges, roads, airports and power lines.

Iron ore demand headwinds offset by lower supply; China steel prices softening following output rebound

Major producers' YTD shipments flat vs 2021

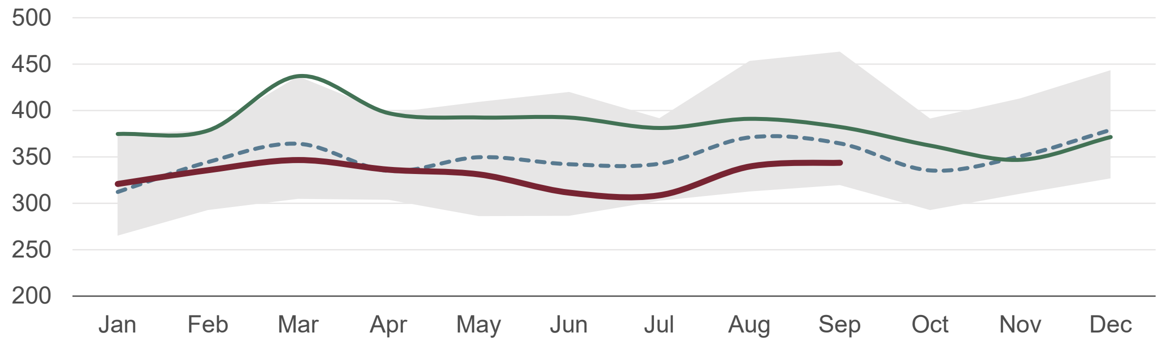
Seaborne shipments, annualised monthly Mt



- Total **seaborne supply** is down -4.5% YTD Sep, due to lower exports from non-major producers.
- China's **steel production and consumption** down by -7% and -8% YTD.
- Constrained **scrap processing and availability** supporting pig iron production, down -4.5% YTD.
- Despite inclement weather, **China's iron ore imports flat YTD.** Port inventories down from 155Mt to 130Mt.
- **China's domestic iron ore supply** is trending below 2021 levels and is set to contract in 2022 due to mining accidents, environmental issues, and operating restrictions.

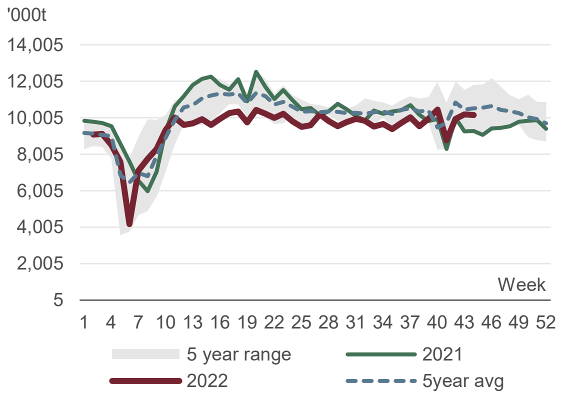
Non-major producers' YTD shipments are down -16% YTD

Seaborne shipments, annualised monthly Mt

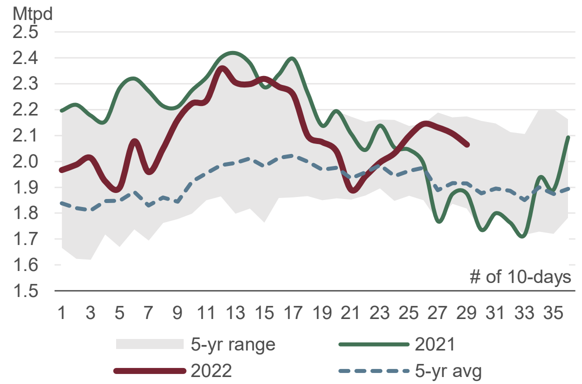


China steel demand and production recovering

Weekly finished steel apparent consumption



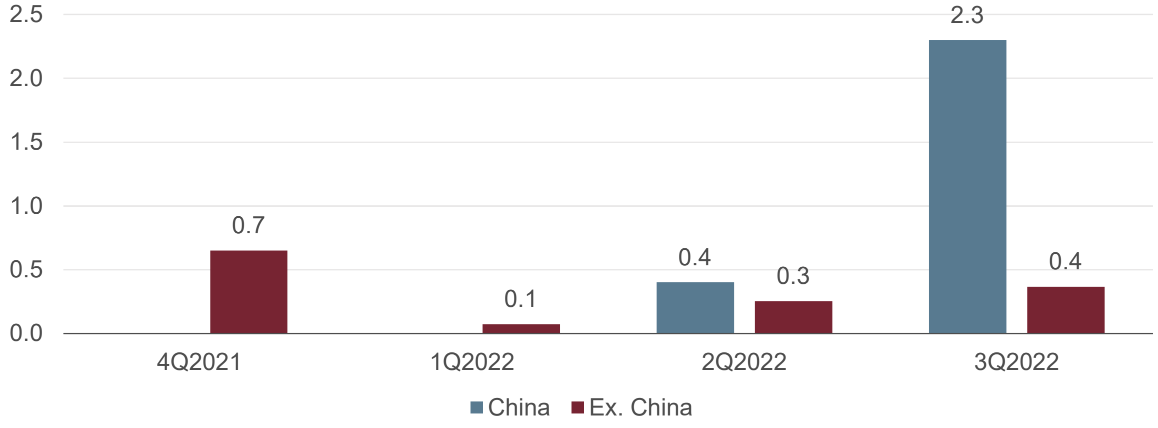
CISA members' daily crude steel production



Source: Kpler, Mysteel, CSIA, RT Market Analysis

Aluminium smelter curtailments gather momentum

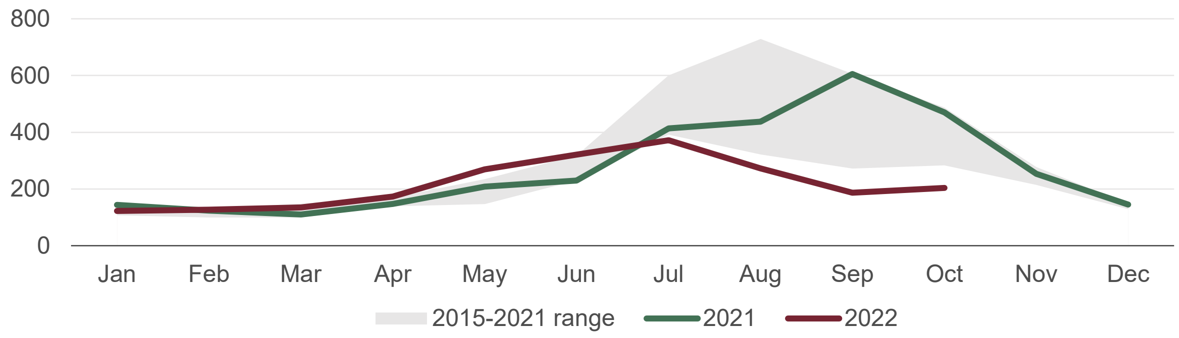
Aluminium production curtailments, Mtpa



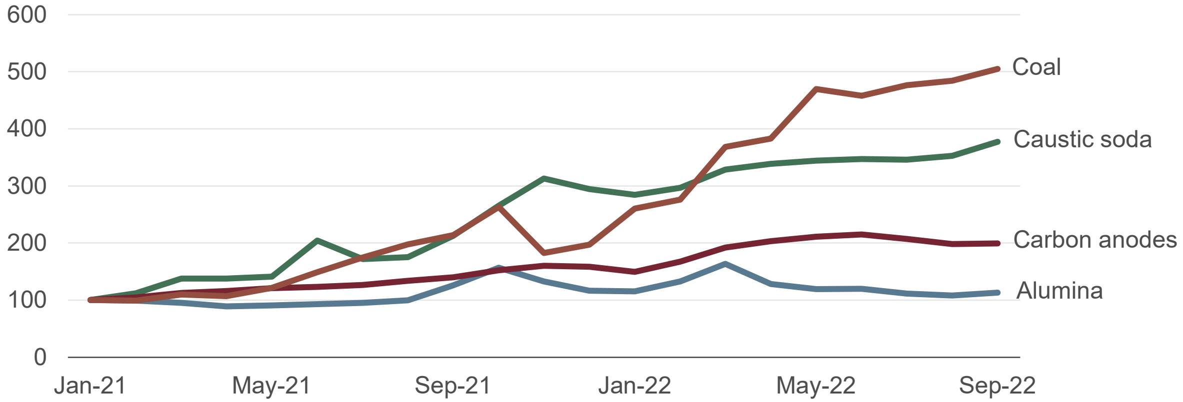
- Aluminium producers in Yunnan curtailed ~1.3Mtpa of capacity in the last two months on low hydropower levels, following on from 1.0Mtpa cuts in Sichuan in August.
- Three Gorges dam inflows in Hubei, China, are well below the minimum levels in prior years.
- Curtailments in Europe on record high power prices.
- Cost inputs remain elevated for aluminium.

Three Gorges Dam inflows, index Jan 2015=100

(4-week rolling average)



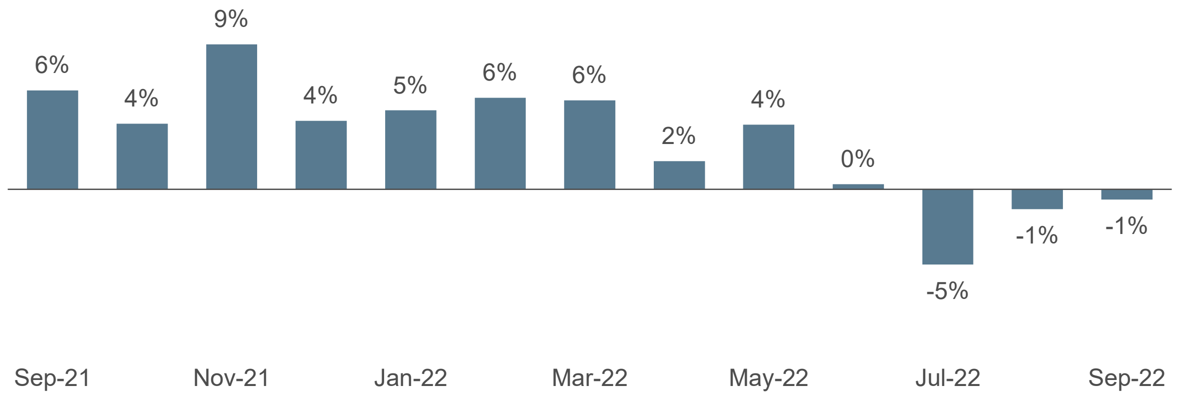
Aluminium key cost variables, index Jan 2021=100



Source: RT Market Analysis, CRU, Wood Mackenzie, WIND, Argus, IHS, S&P Global

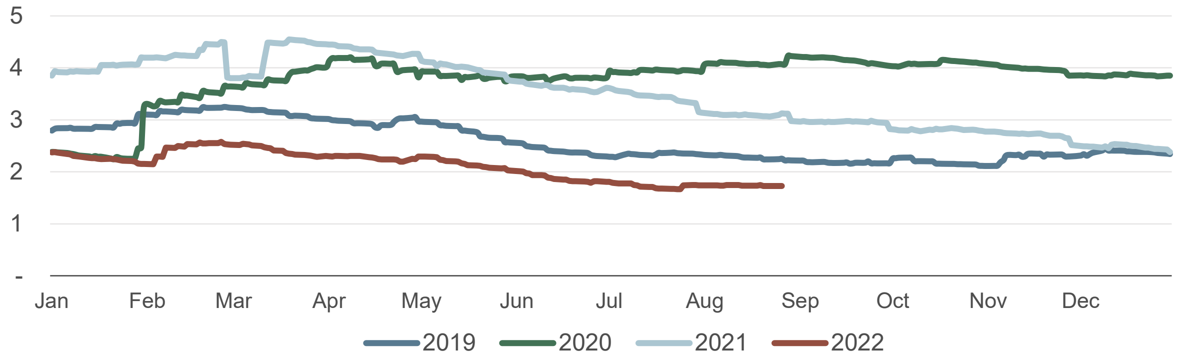
Aluminium demand falls amid economic headwinds

Aluminium ex. China shipments[1], YoY

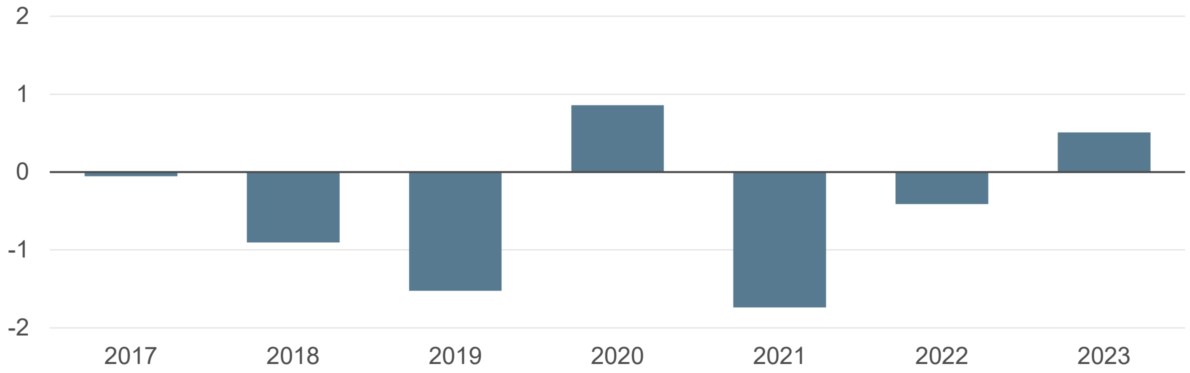


- European demand to contract in 2H22 after resilient 1H22 performance. Q3 shipments from European downstream companies show 5-10% YoY contraction in aluminium shipments.
- US demand resilient YTD (Jan-Sep) with firm shipments on strong order books. New orders data has weakened. China demand turning the corner.
- Aluminium demand from EVs and renewables show strong growth.
- Market in deficit in 2022 before moving into small surplus next year.

Aluminium global reported inventories[2], Mt



Aluminium market balance, Mt

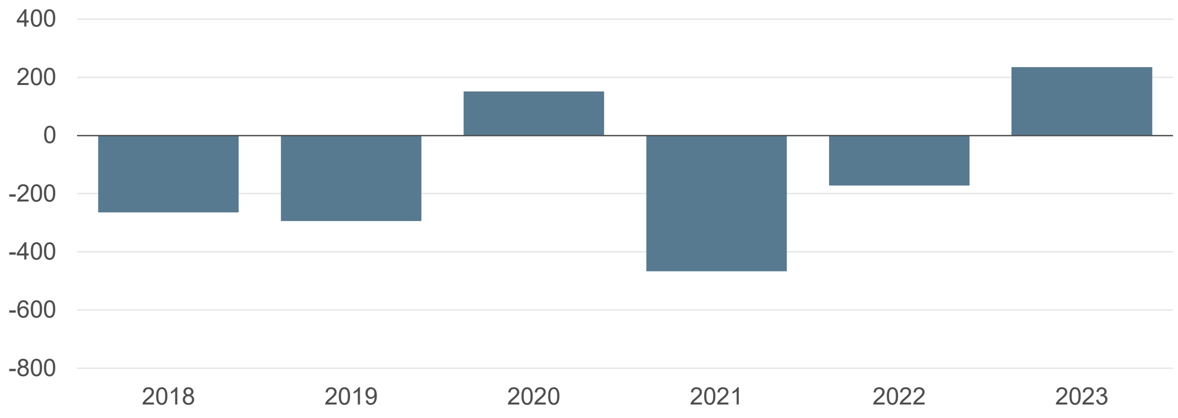


Source: RT Market Analysis, CRU, Wood Mackenzie, LME, CME, SHFE, Mysteel

[1]Germany, US, Canada, South Korea, Taiwan, Japan shipments (Germany, South Korea and Taiwan data to August), [2]Japan Port Stocks, LME, LME off-warrant, CME, China social inventories

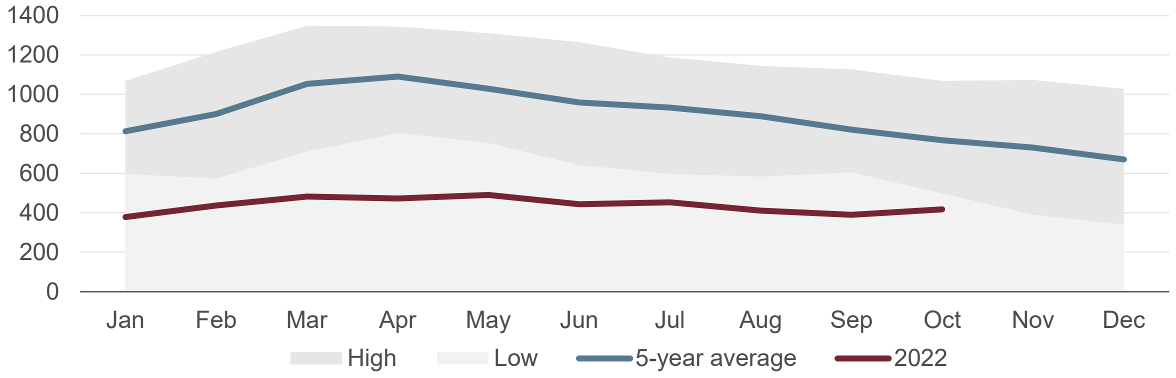
Copper price impacted by macro outlook but markets remain tight

Refined copper balance, kt

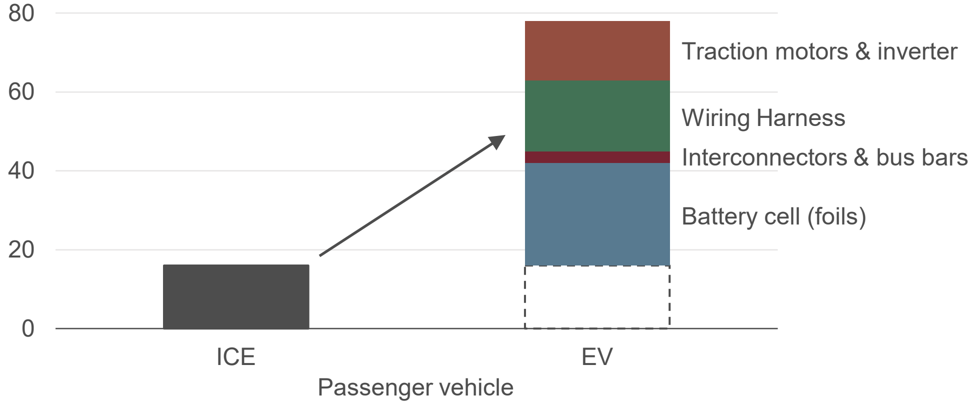


- Physical market tightness contrasts with the near-term worsening macro-outlook; price volatility to persist.
- Refined market moving into oversupply from supply incentivised over 2018-21 when prices went above 300c/lb.
- Visible stocks remain below 5-year average and require rebuilding after market deficits.
- Demand will be supported by growth in renewables and electric vehicles (EVs), where intensity use is also higher.

Copper inventories below long-run range, kt



Copper intensity from ICE vs EV, kg Cu



Source: RT Market Analysis, LME, COMEX, SHFE, CFTC