



Data, Insight,
Strategy &
Communities

The Critical Decade

Opportunities in a Shock-Prone World

CRU. Independent *expert* intelligence

The Critical Decade

Opportunities in a Shock-Prone World

Session 1

08:45 – 10:00am

OPPORTUNITIES AND RISKS FOR COMMODITIES

Macro View: Trends versus Shocks

Managing Risk in Practice

Regional Premiums: Understanding Shocks and Trends

Session 2

10:30 – 11:45am

FORGING THE FUTURE – CRU's Global Outlooks

New Frontiers of Demand

Fault Lines in Supply

Creating Value in Uncertain Times

Workshops

Risk Navigator

10:15am

Battery Materials

11:45am

Knowledge Hub: Ask the Expert

Meet with our experts during the break to discuss the markets and our views.

CRU Breakfast Companion

Yours to take with you, with more detail on today's event, our forecasts and the wider market.

Session 1 | Opportunities and Risks for Commodities



PRESENTERS

Alex Tuckett
Head of Economics



PRESENTERS

Matthew Perlman
Senior Innovation
Manager, Product



PRESENTERS

Chris Lawson
VP, Market Intelligence
& Prices



PRESENTERS

Tom Rutland
Head of Non-Ferrous
Metals, Market
Intelligence & Prices



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Metals in Transition

Alex Tuckett, Head of Economics

CRU. Independent *expert* intelligence

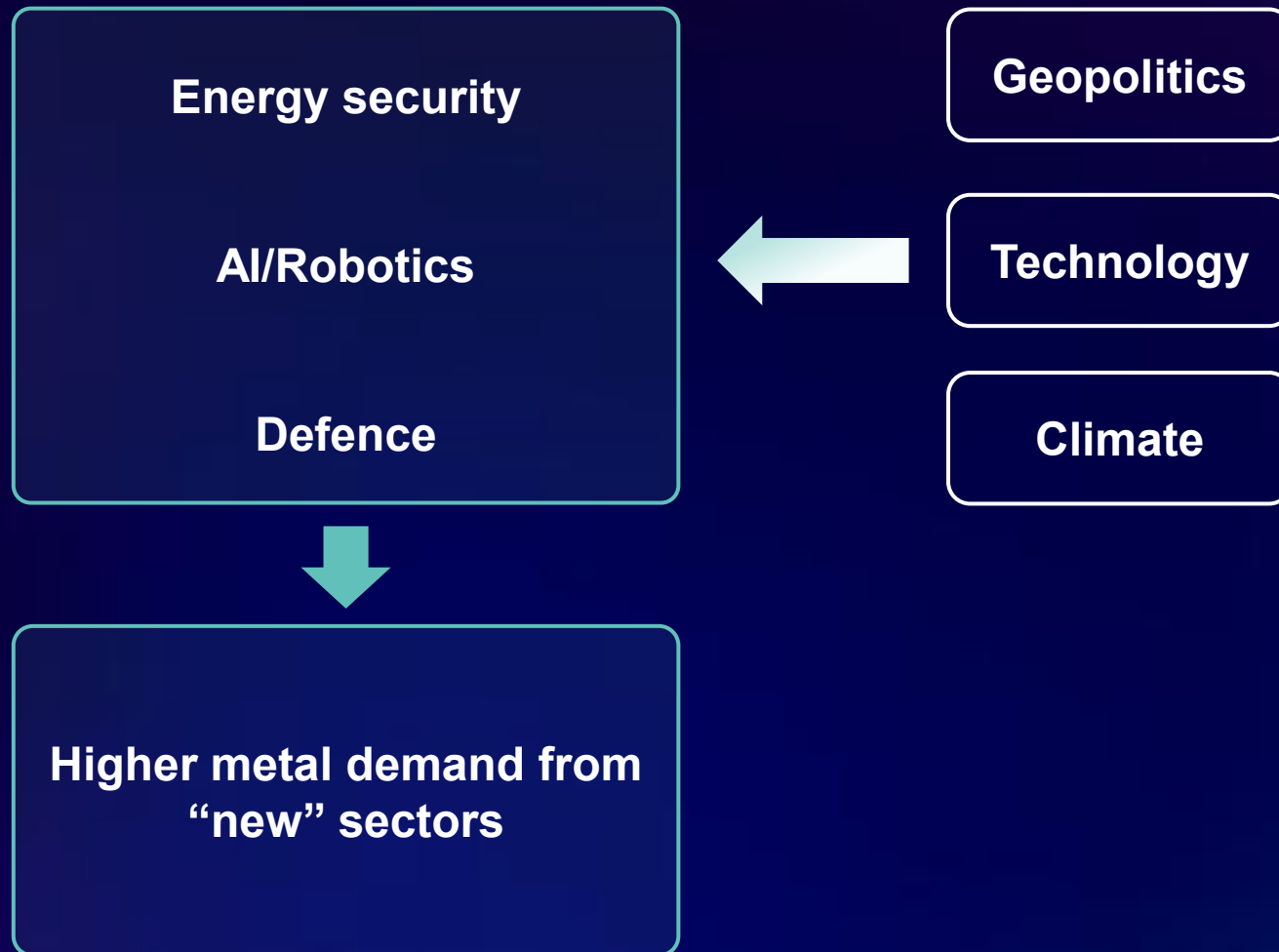
Macro forces change the composition of metal demand

Geopolitics

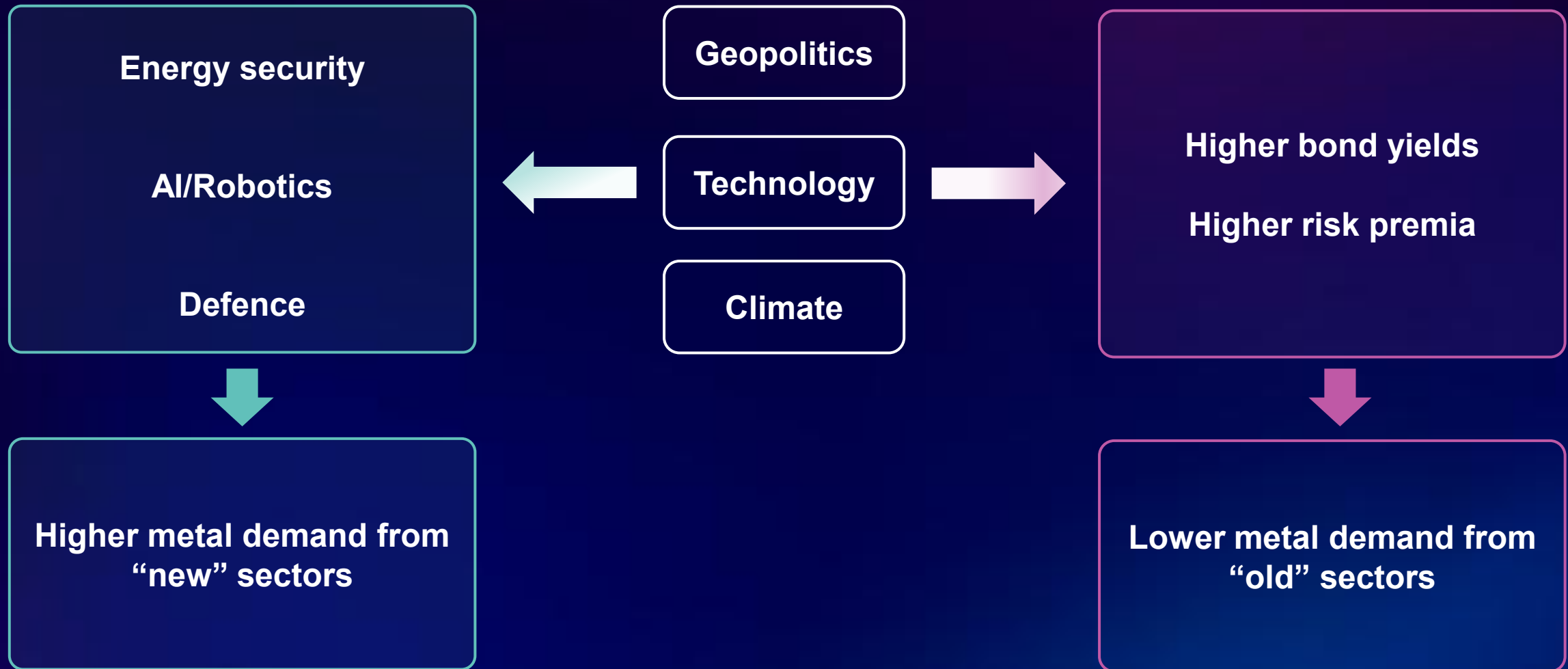
Technology

Climate

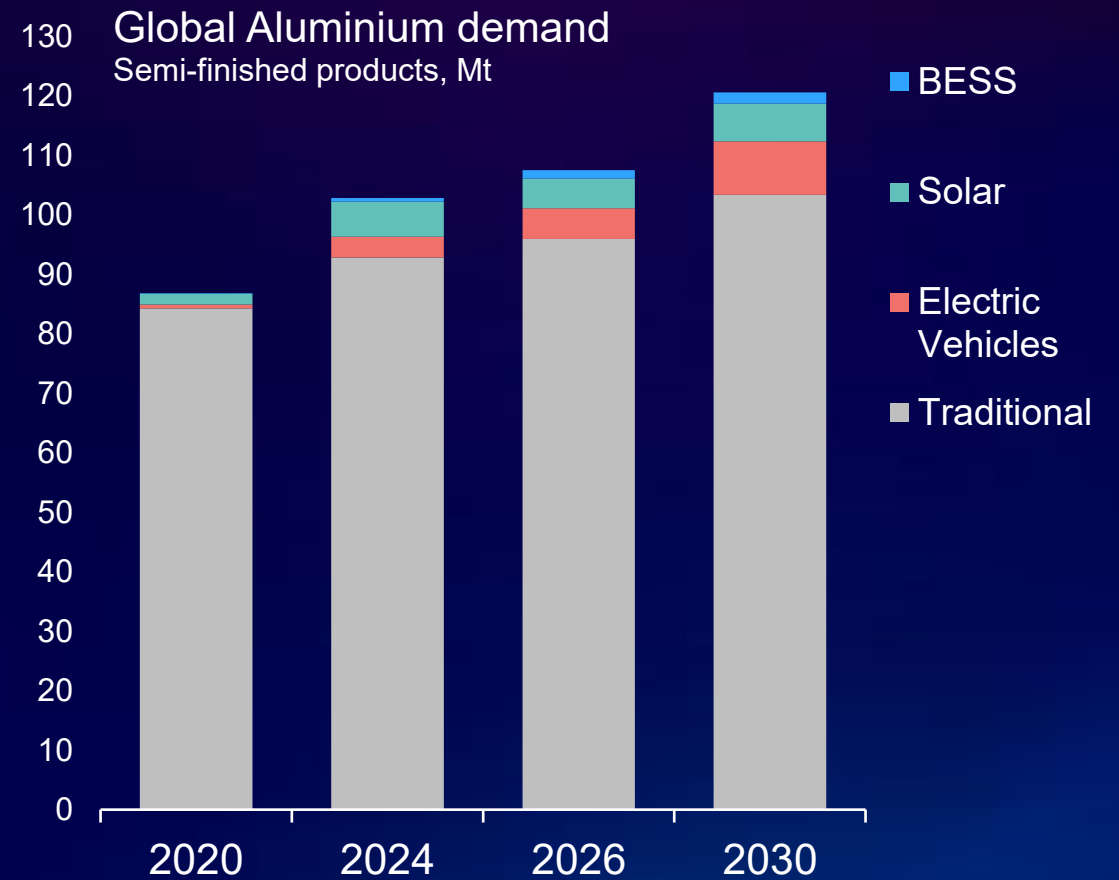
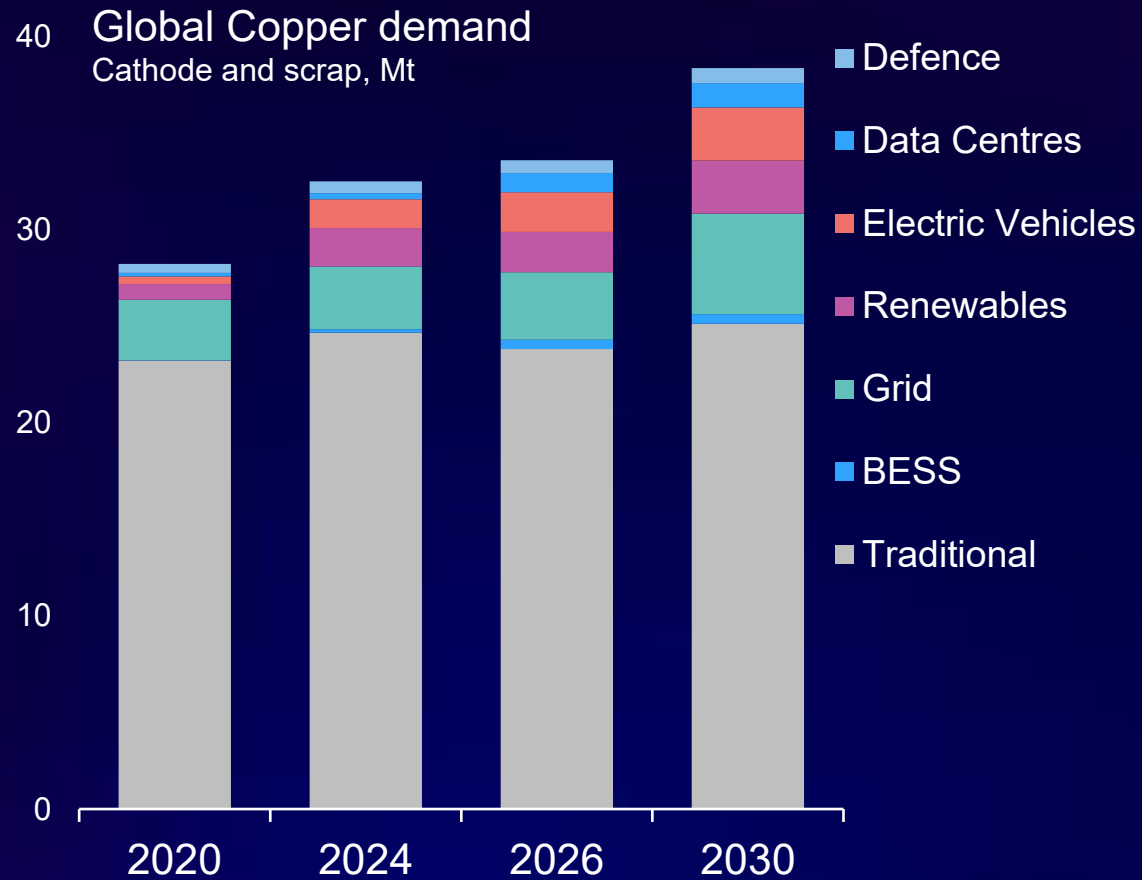
Macro forces change the composition of metal demand



Macro forces change the composition of metal demand



New sectors will change the shape of demand

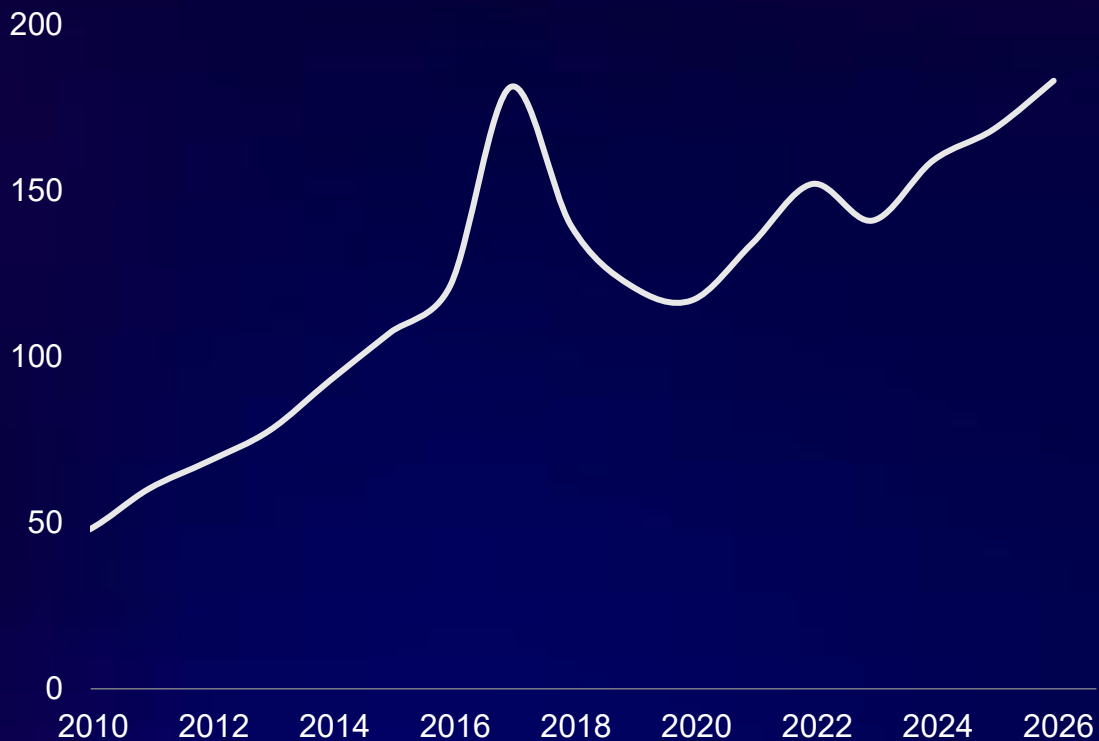


DATA: CRU

China will play a greater role in the global industry

China's non-financial outward direct investment

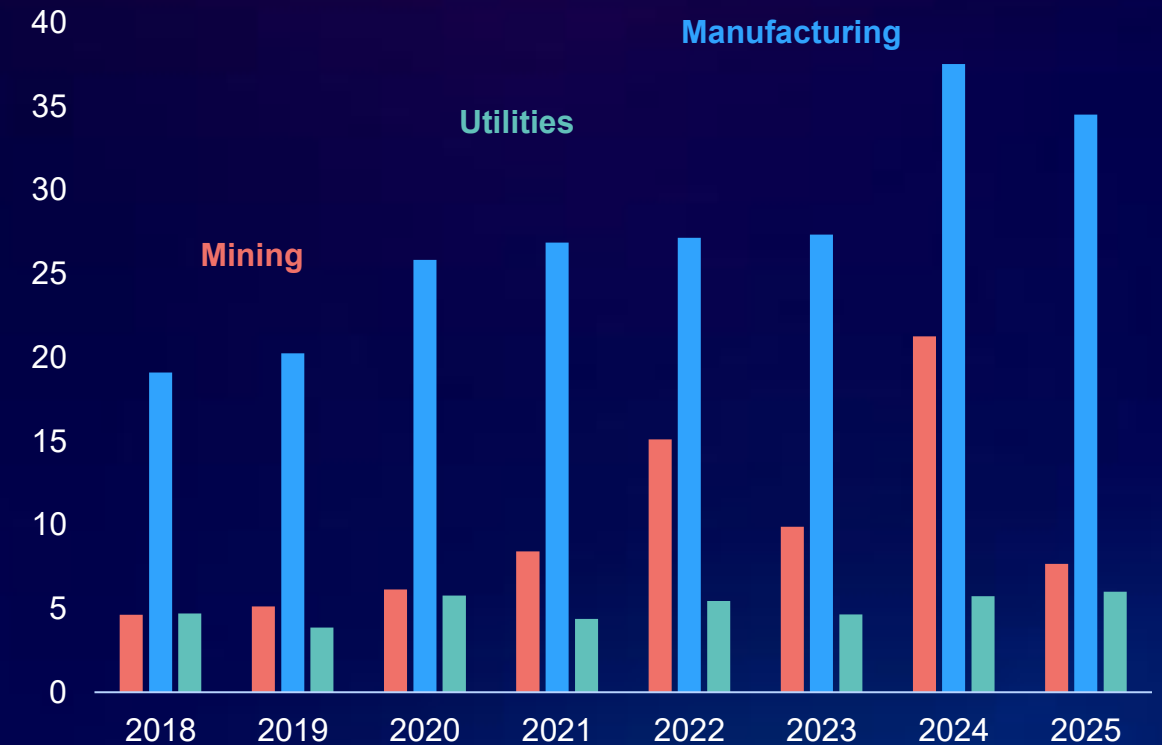
\$bn



DATA: CEIC

Chinese outward direct investment

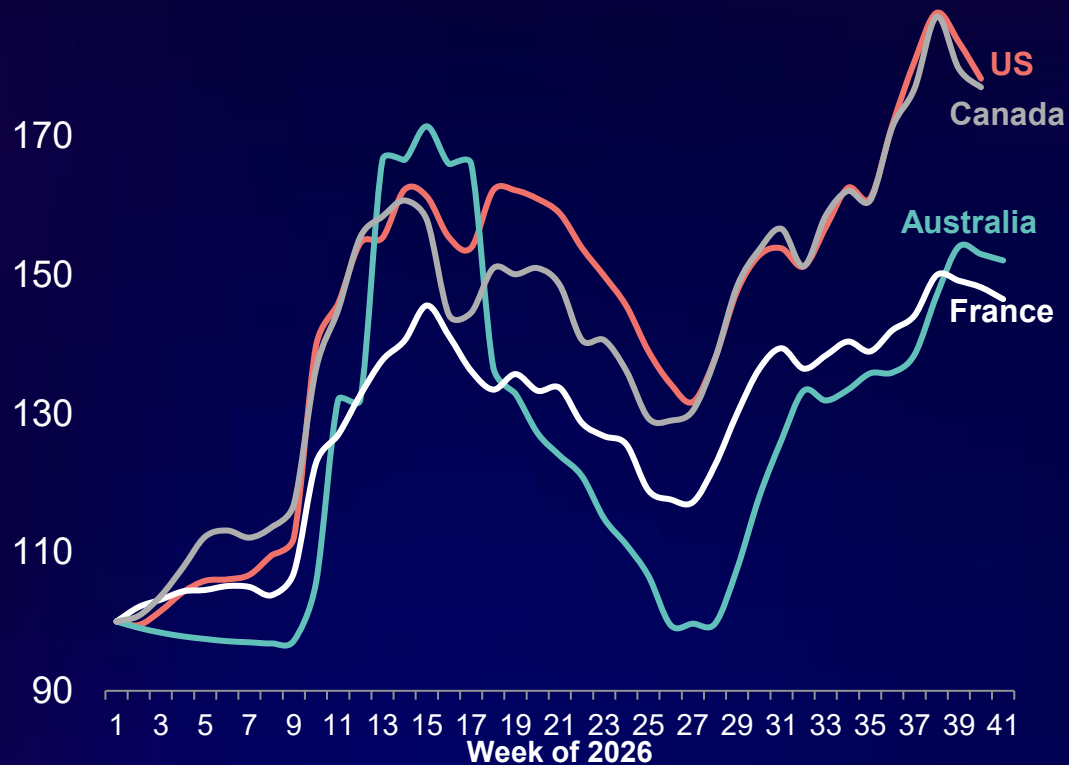
\$bn



Energy shock: Don't take resilience for granted

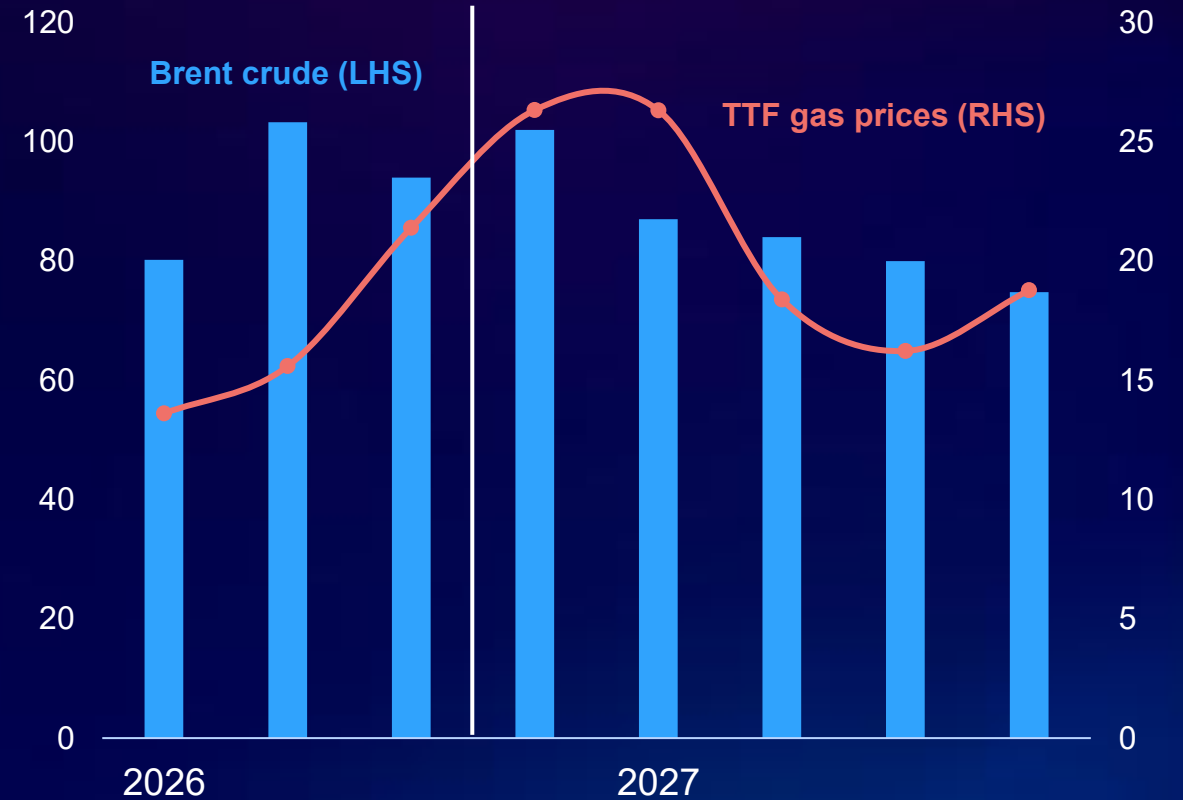
Diesel prices

1st week of 2026 = 100



DATA: CRU, CEIC, Oxford Economics

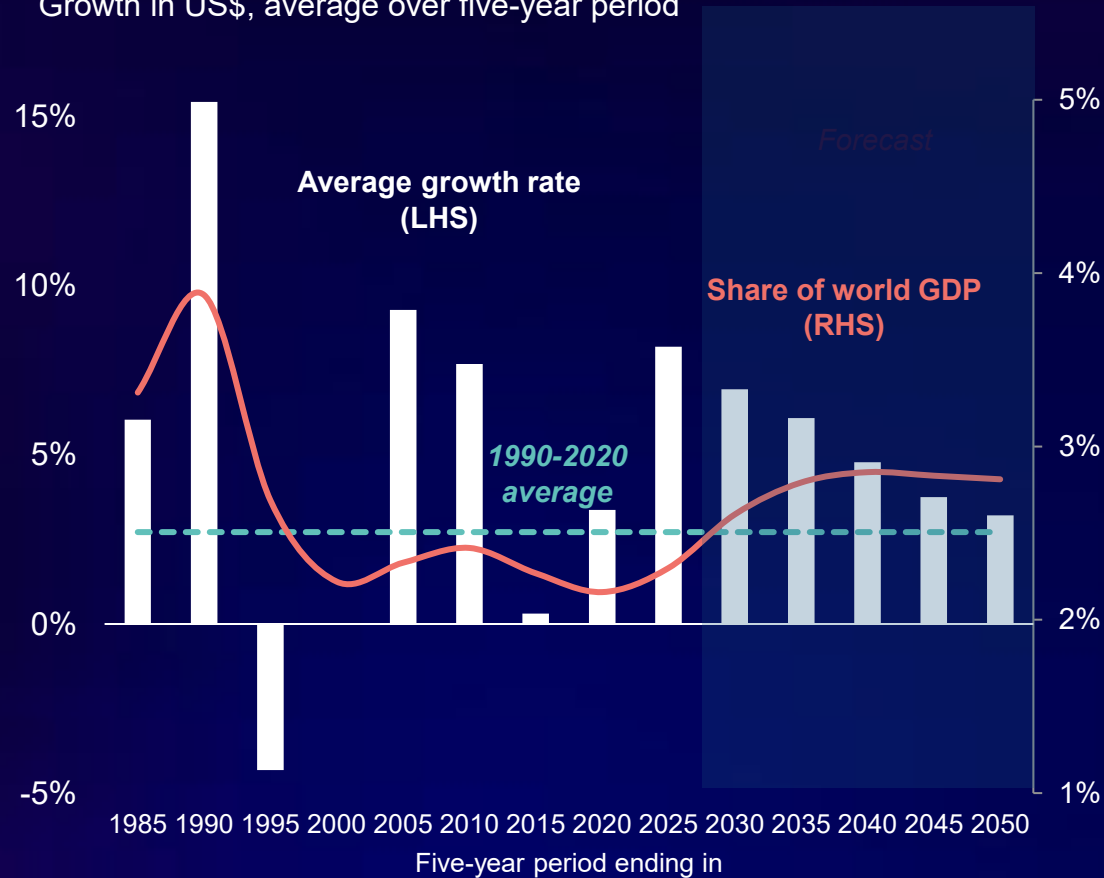
Energy prices



A lot of defence spending will end up in inflation

Global defence spending in nominal terms

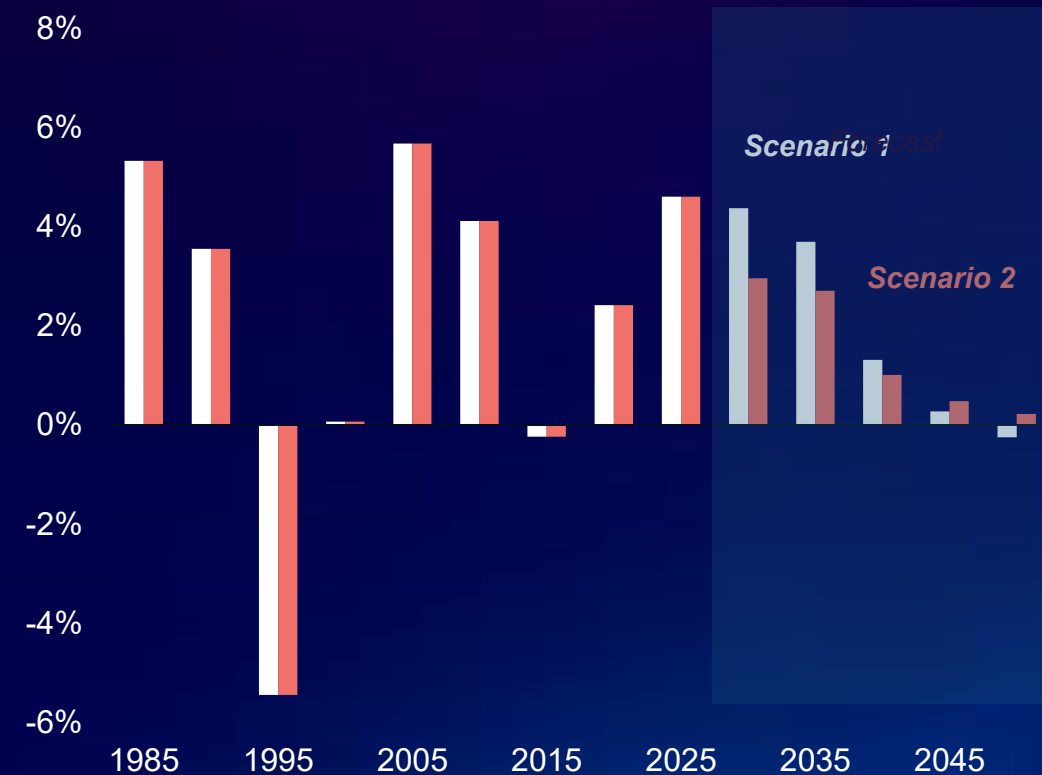
Growth in US\$, average over five-year period



DATA: CRU, SIPRI

Global defence spending in real terms

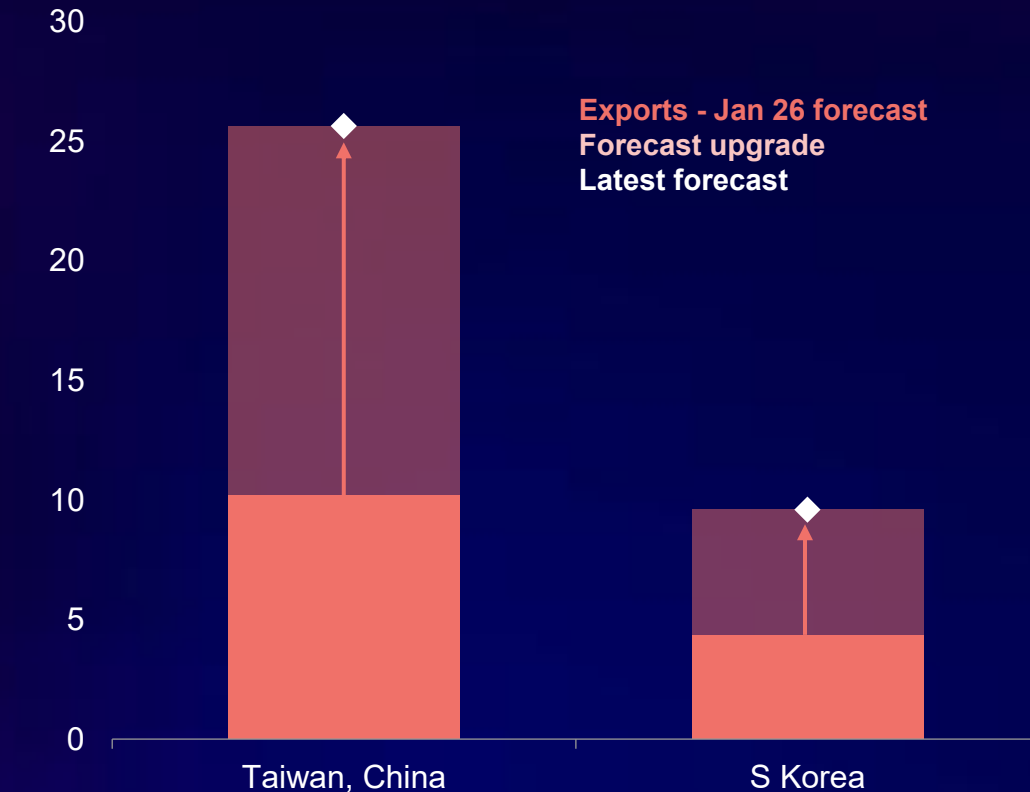
Change in constant (2024) US\$ terms



AI will be a global story, not just a US one

Forecasts for export growth, 2026

% change y/y

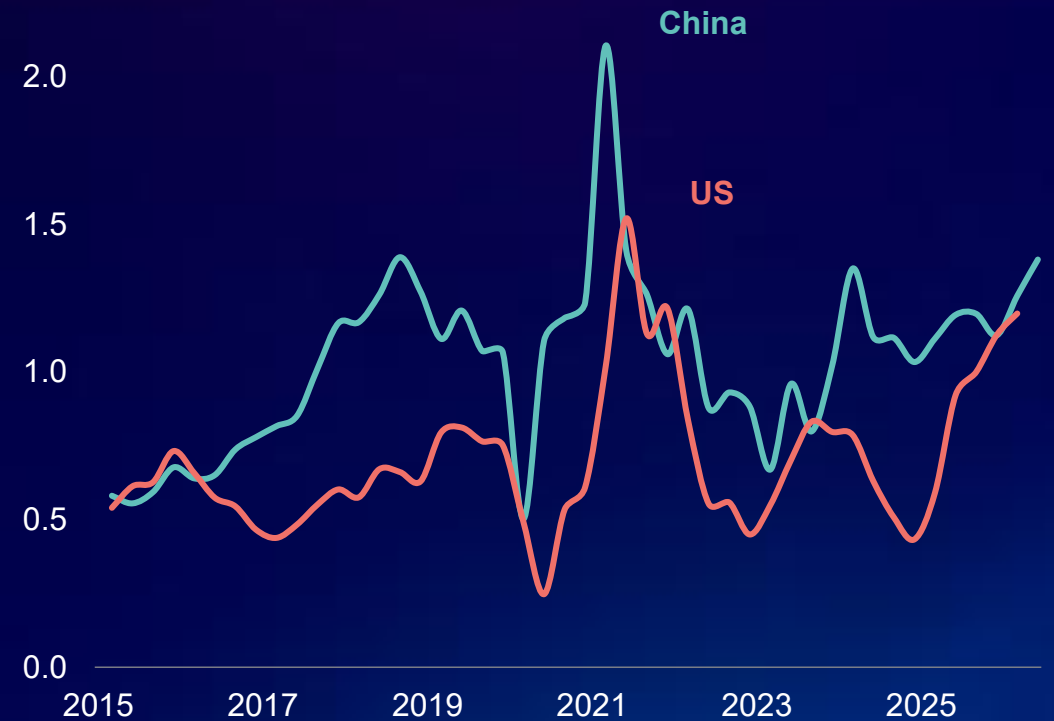


DATA: CRU, Oxford Economics, CEIC

Contribution of ICT industry to y/y GDP growth

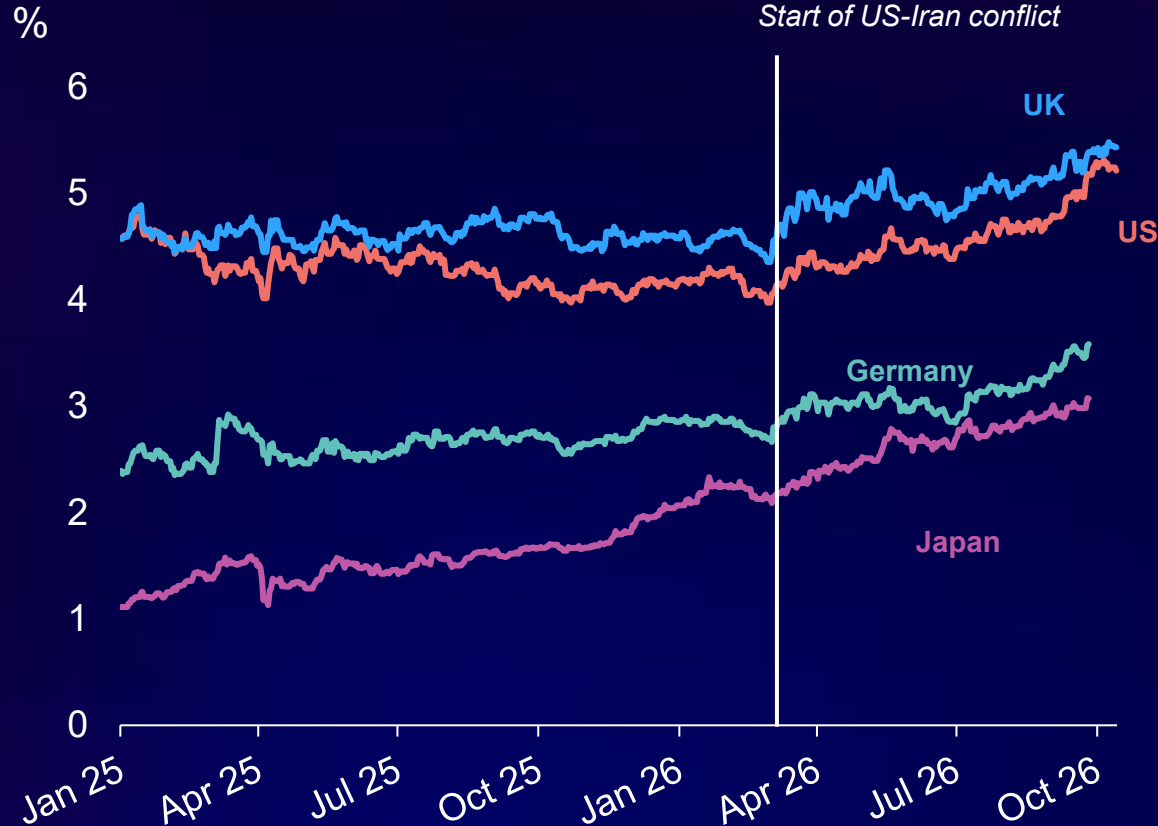
Percentage points, SA, includes both services and manufacturing

2.5



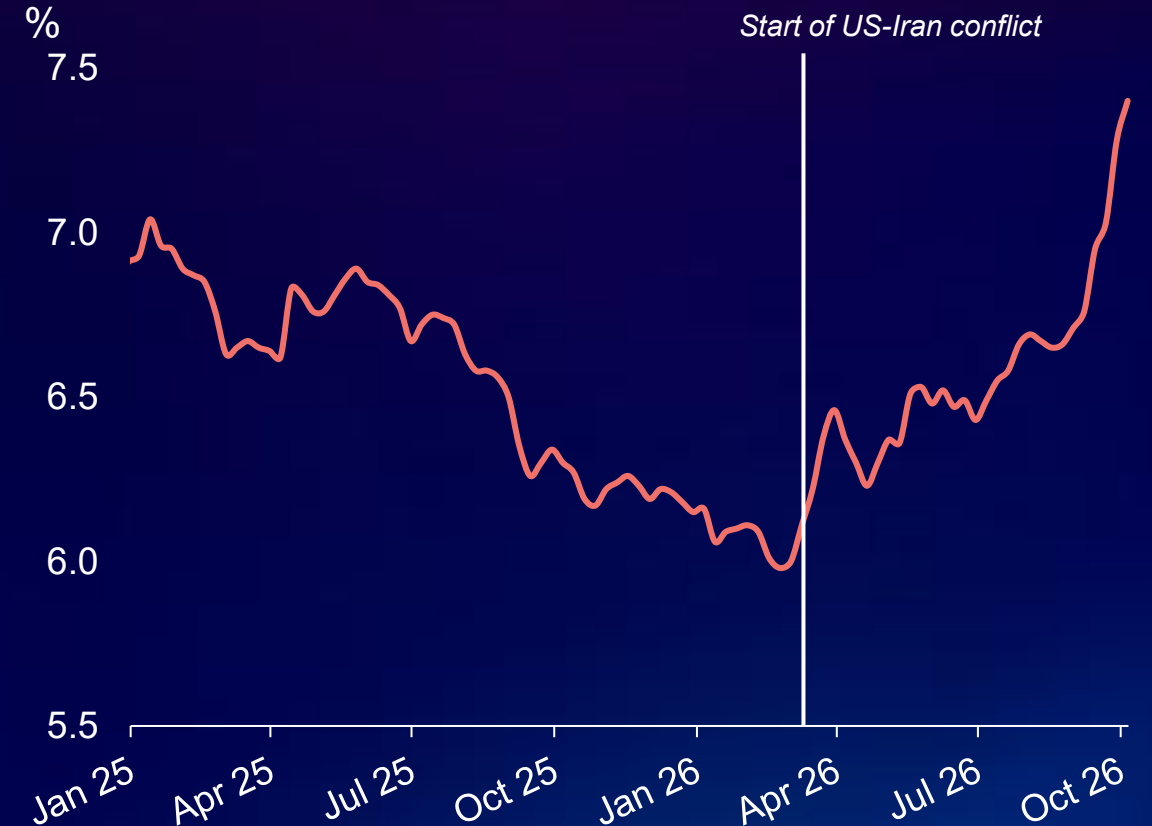
Higher bond yields will crowd out 'old' sectors

10y government bond yields



DATA: CEIC

US 30y mortgage rates



- The world is becoming a more volatile and less predictable place – geopolitics, technology and climate
- These forces will reshape demand for many metals, creating positive demand trends
- However, these forces also bring substantial risks



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Managing Risk in Practice

Matthew Perlman, Senior Innovation Manager, Product

CRU. Independent *expert* intelligence

The new normal, is anything *but* normal

**Fragmentation of supply
chains**

**Conflict reshaping trade
and supply**

**Risks are propagating
down supply chains**

Understand where risk begins, how it develops and where it travels

**WHAT SUPPLY IS
AT RISK?**

**PROBABILITY OF
RISK
MATERIALISING?**

**HOW LONG WILL
DISRUPTION
LAST?**

**WHAT WILL THE
IMPACT ON
PRICES BE?**

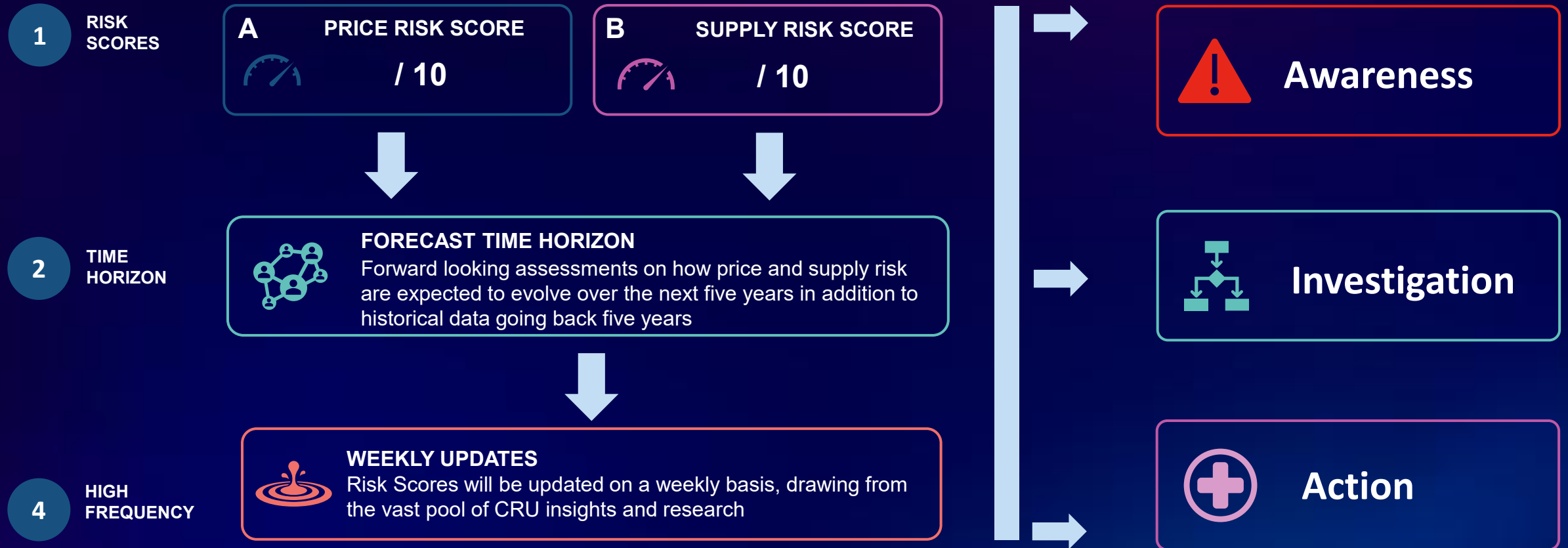


“There is no happiness in the world as great as the resolution of doubts”

*Ancient Wisdom

Introducing CRU Risk Navigator

Back-tested, fundamentally-driven AI RISK INTELLIGENCE to guide you through supply and price disruption



Risk Navigator goes a mile wide, inch deep

HORIZONTAL INSIGHT

CRU Risk Navigator

Insights across commodity markets with one standardised Risk Score for assessing market risk

MARKETS

INDUSTRIES

Steel

Aluminium

Base Metals

Fertilizers



The Risk Score

One common scale, so risk is assessed the same way for every market and can be compared side by side.

Steel

Alum

Base

Fert



AI Methodology

Processes and synthesises CRU content to generate consistent Risk Scores.



Foundation CRU Insights & Data

Built on CRU's proprietary analysis, prices and data.

VERTICAL INSIGHT

CRU Product Portfolio

Deep vertical insight down each physical value chain, from Insights to Data.



Delivered through Insights & Data

Prices

Assessed & derived prices

Market Data

Supply, demand & forecasts

Asset Data

Facility costs & emissions

Economics & Sustainability
Macroeconomy & transition

CRU Sulphuric acid has been the reddest of flags in 2026

Sulphuric acid, Supply risk score (changes through 2026)



DATA: CRU

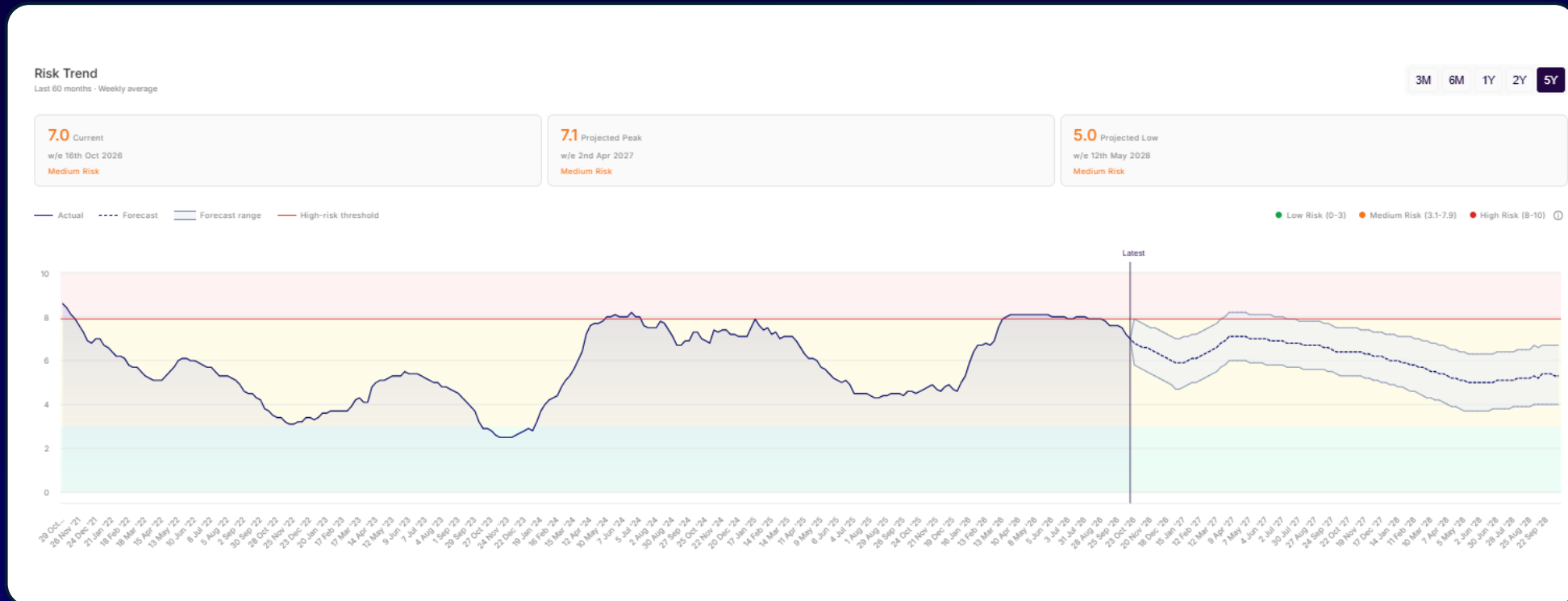
- **January to 27 February (7/10):** Prices were firm and already high against history due to constrained supply. However, in January CRU's own forecast expected prices to peak that month.
- **Feb 28 – late March (8/10):** The Middle East conflict pushed freight costs up and prices neared their 2022 peaks. Affordability concerns start to appear in the reports.
- **13 April to 11 May (10):** Chinese export halt confirmed, prices rose by up to \$100/t in a week, and benchmarks hit records. With China supply representing ~20%, risk scores hit their maximum.

Aluminium: Increased Downside Risk for Prices

Supply risk is driven by fundamental supply drivers that our global analysts are constantly researching and reporting on.

Price risk is measured using an AI methodology, with a rolling distribution to indicate whether we are in a range or trend market.

Taken together, the price risk score and the supply risk score will contextualize our price forecast, not replace it.



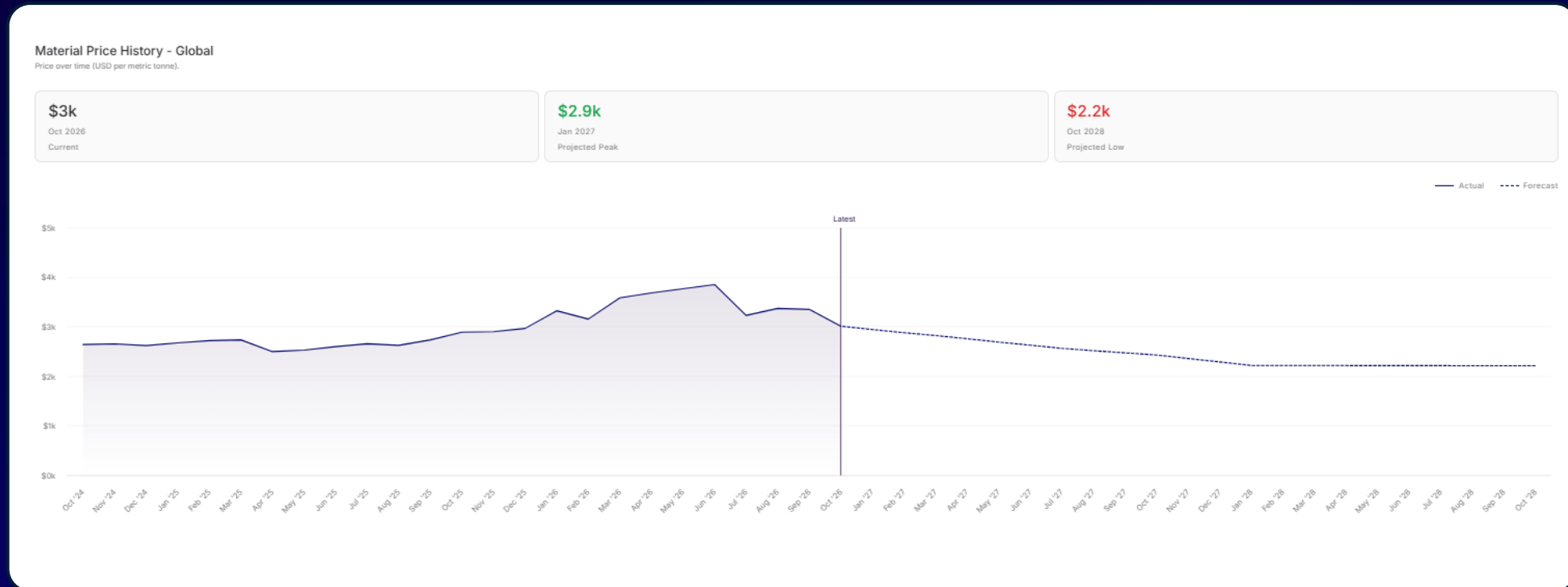
SOURCE: CRU Risk Navigator

Aluminium: Increased Downside Risk for Prices

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Aluminium: Increased Downside Risk for Prices

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SOURCE: CRU Risk Navigator



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How CRU Regional Premiums Help You Understand Shocks and Trends

Chris Lawson, VP, Market Intelligence & Prices

Tom Rutland, Head of Non-Ferrous Metals

CRU. Independent *expert* intelligence

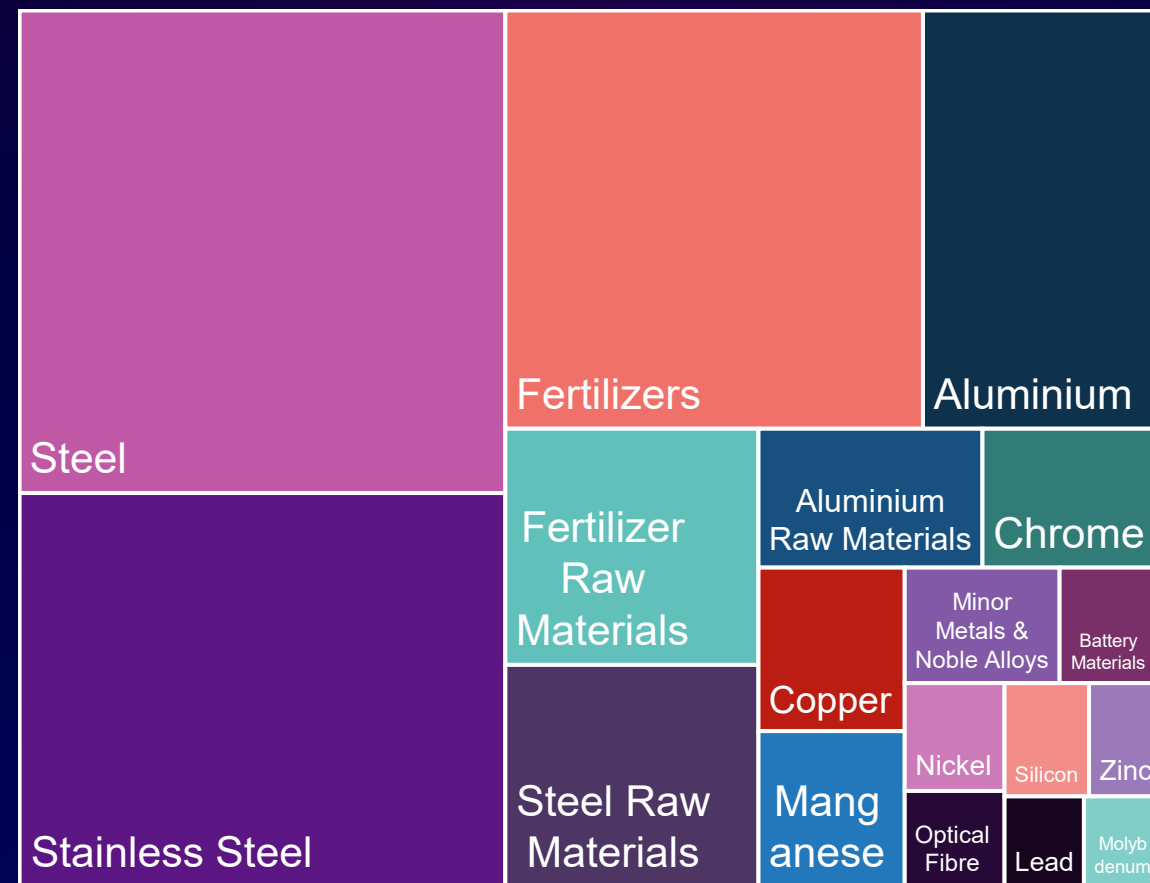
CRU is evolving its portfolio of commodity prices

+860 existing prices across the mining, metals, fertilizer and battery industries.

All assessed prices have passed a comprehensive **third-party audit**, aligning them with **ISOCO principles**.

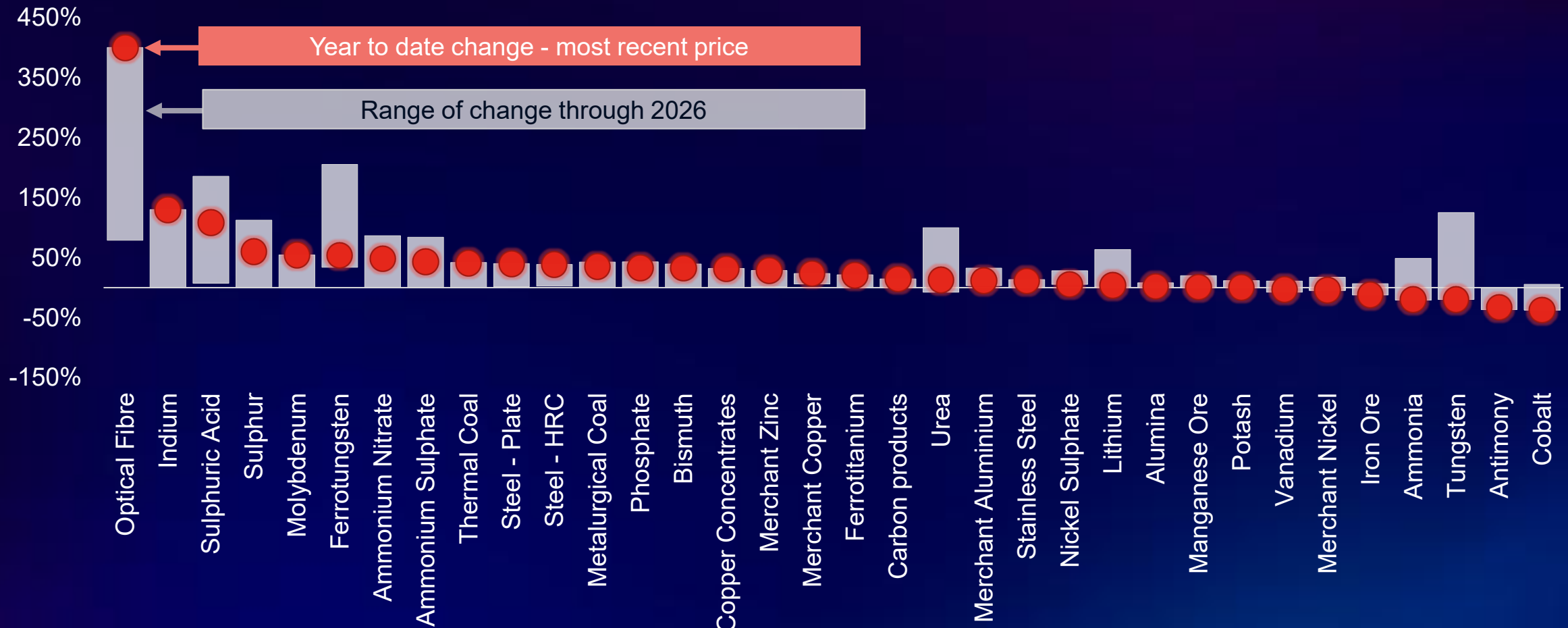
Our prices are robust, representative of the market, and **backed by deep analysis and insight**.

CRU Prices Portfolio



CRU Commodity price performance

CRU commodity price performance - year to date change, %



DATA: CRU

LME metal price performance: Comparatively muted

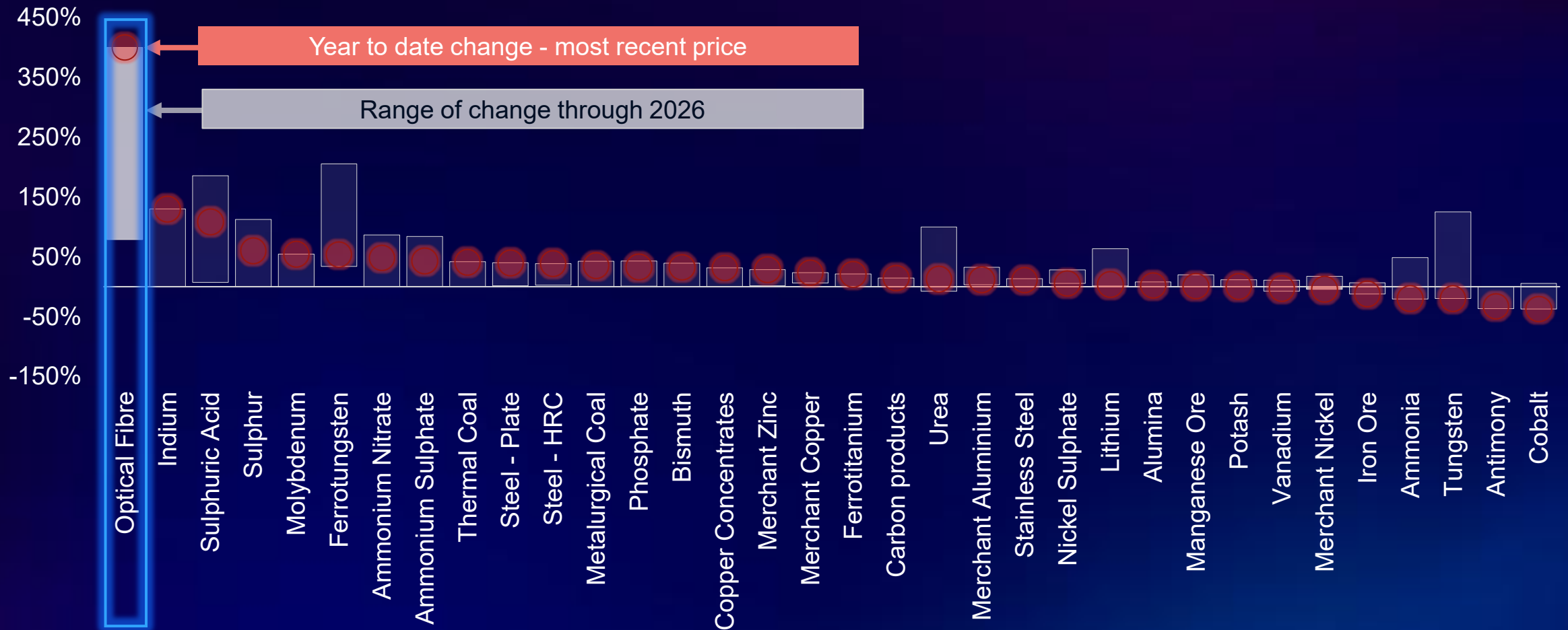
CRU commodity price performance - year to date change, %



DATA: CRU

Optical fibre: Demonstration of the thematics

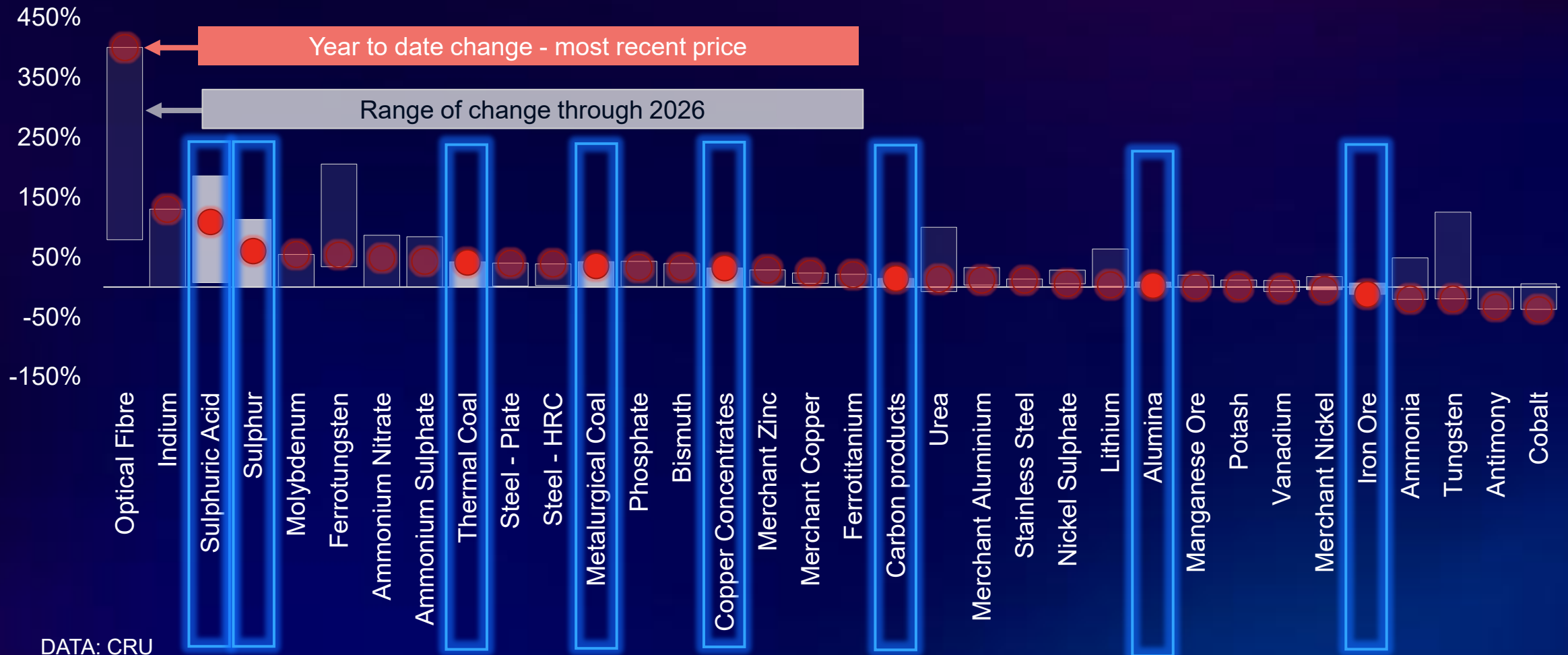
CRU commodity price performance - year to date change, %



DATA: CRU

Raw material markets exposed to the Middle East conflict

CRU commodity price performance - year to date change, %



DATA: CRU

CRU Commodity Price Performance - year to date change, %



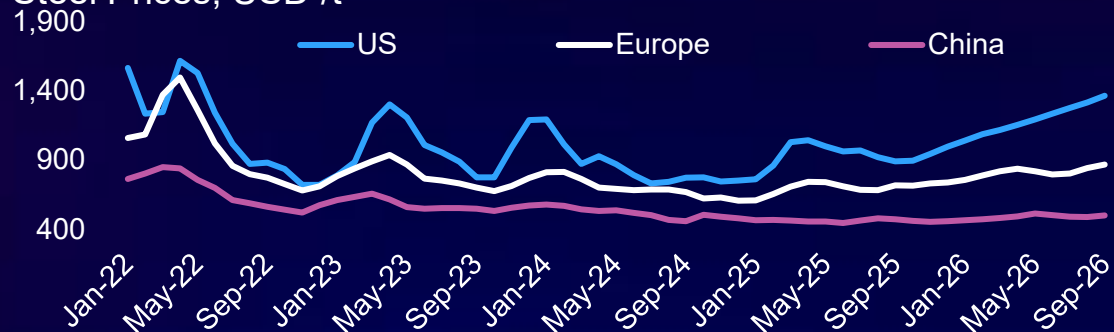
DATA: CRU



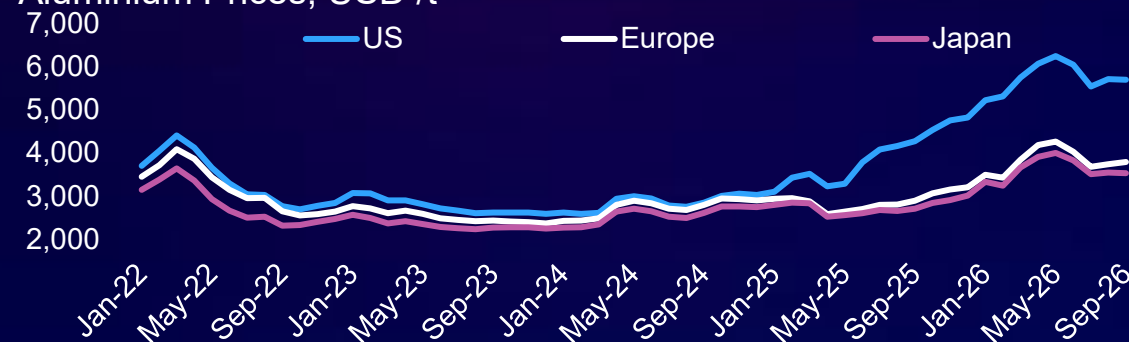
The era of American exceptionalism

Physical metal prices tell a powerful story of **tariffs** and **tightness**

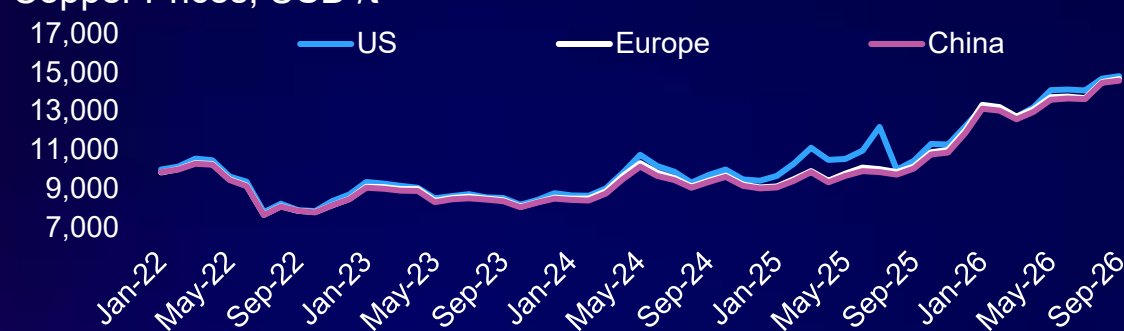
Steel Prices, USD /t



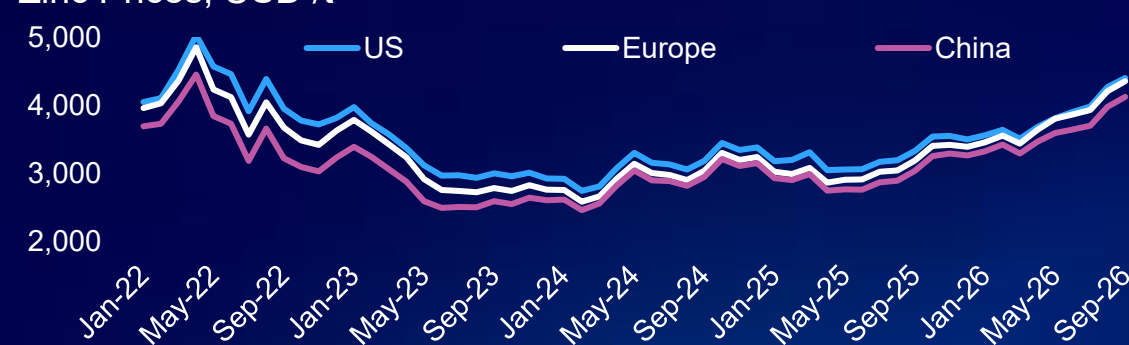
Aluminium Prices, USD /t



Copper Prices, USD /t

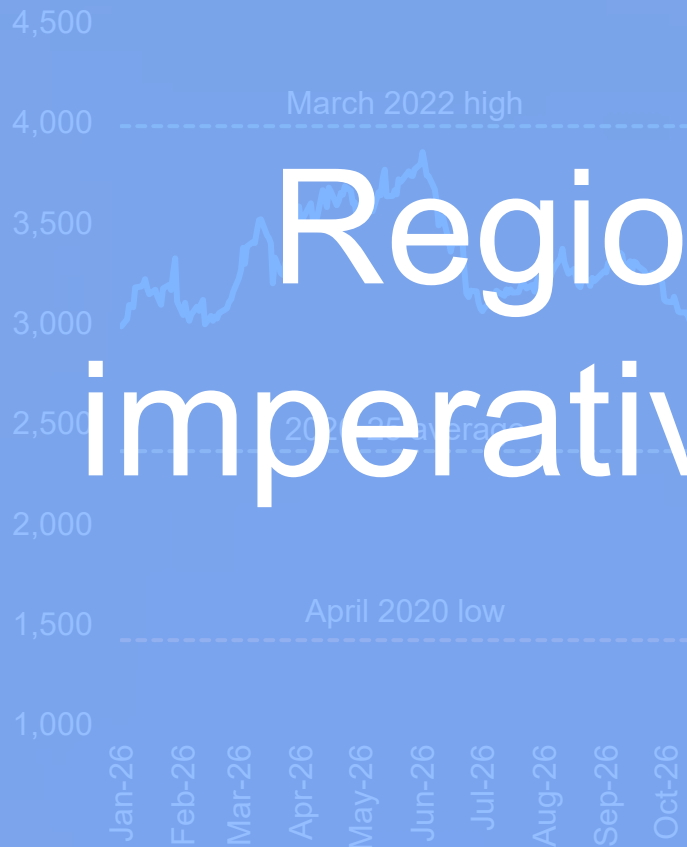


Zinc Prices, USD /t



DATA: CRU

LME Aluminium price, cash, \$ /t



LME Aluminium Premium, in-warehouse Rotterdam, \$ /t



Asia Aluminium Premiums, \$/t

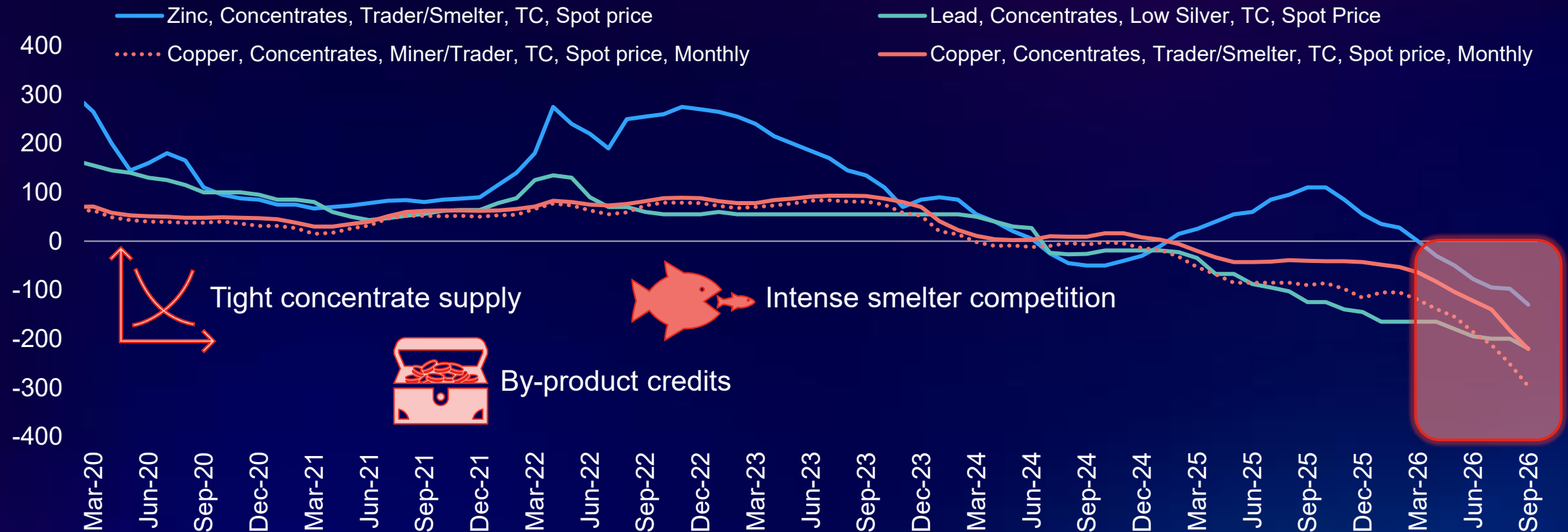


Regional differentials are
imperative to capturing market
opportunity

DATA: CRU Aluminium Service, LME

Negative treatment charges show the disparity in smelting and mining investment...

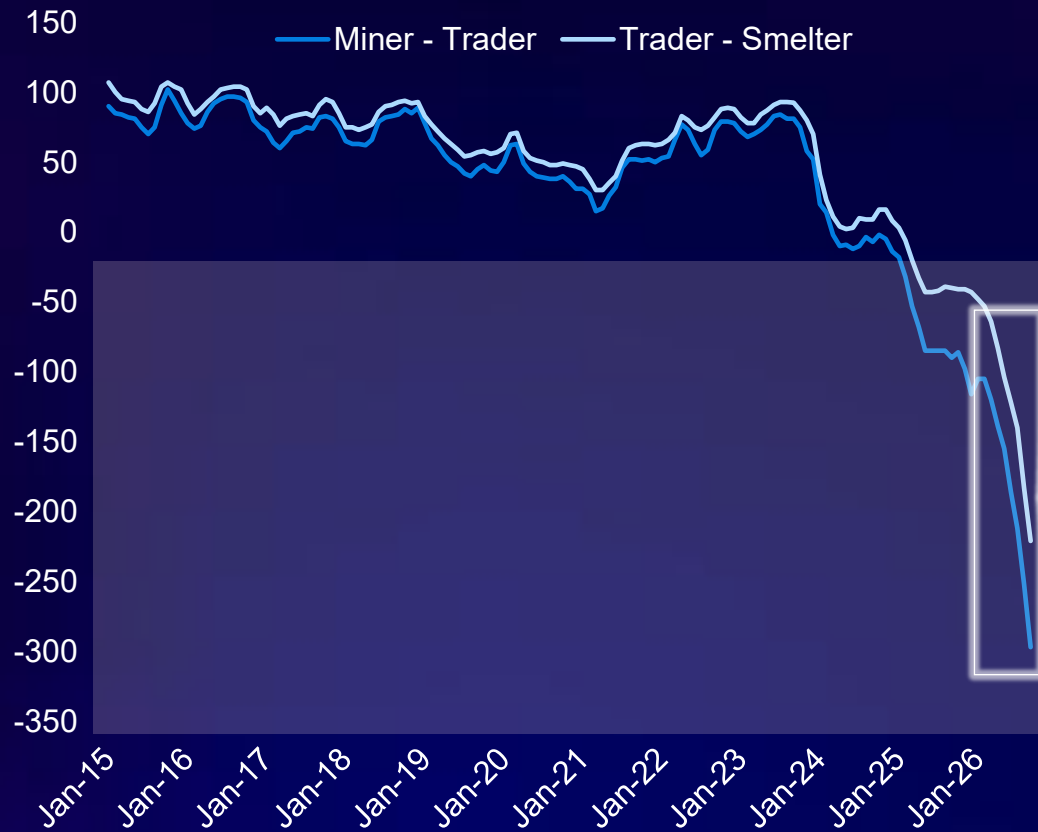
Concentrates treatment charges, \$ /t



DATA: CRU

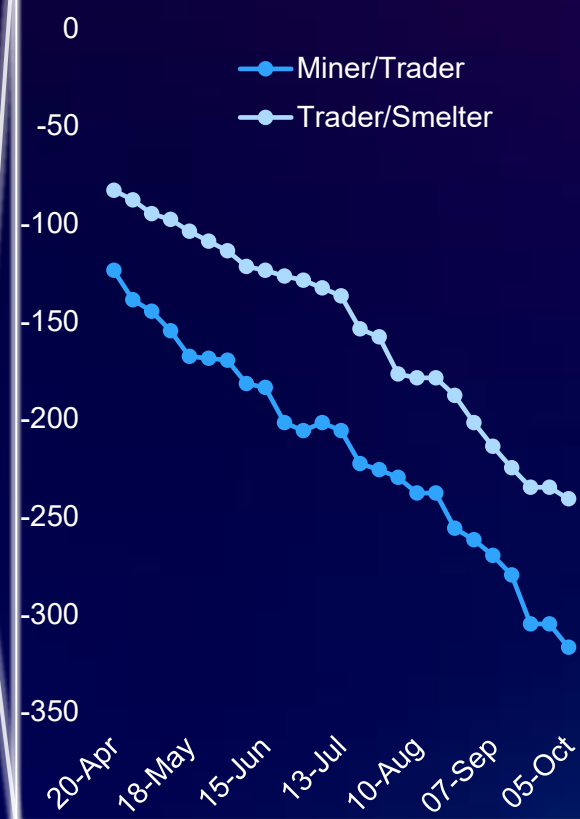
Copper concentrate treatment charges continue to slide

Copper Concentrate Treatment Charges, CIF Asia, \$ /t

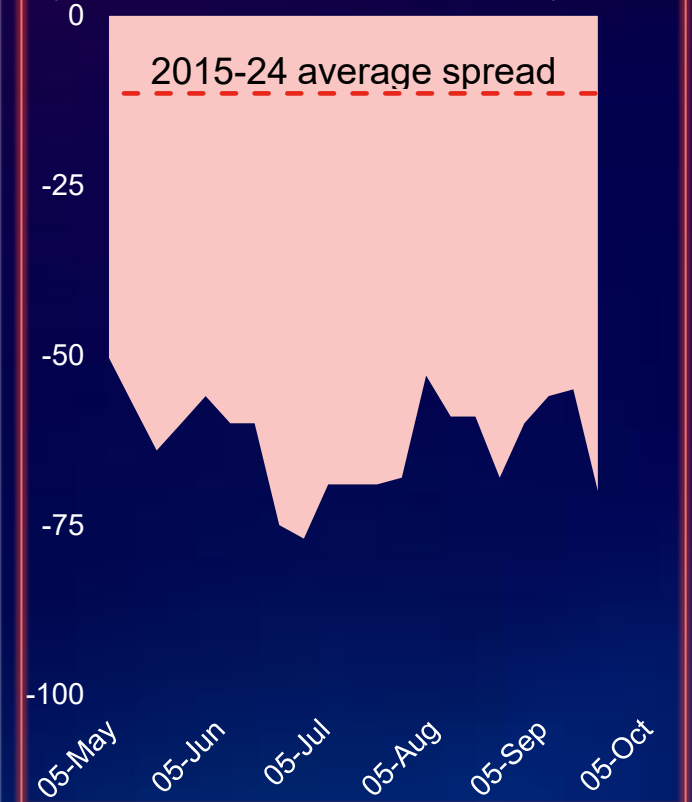


DATA: CRU

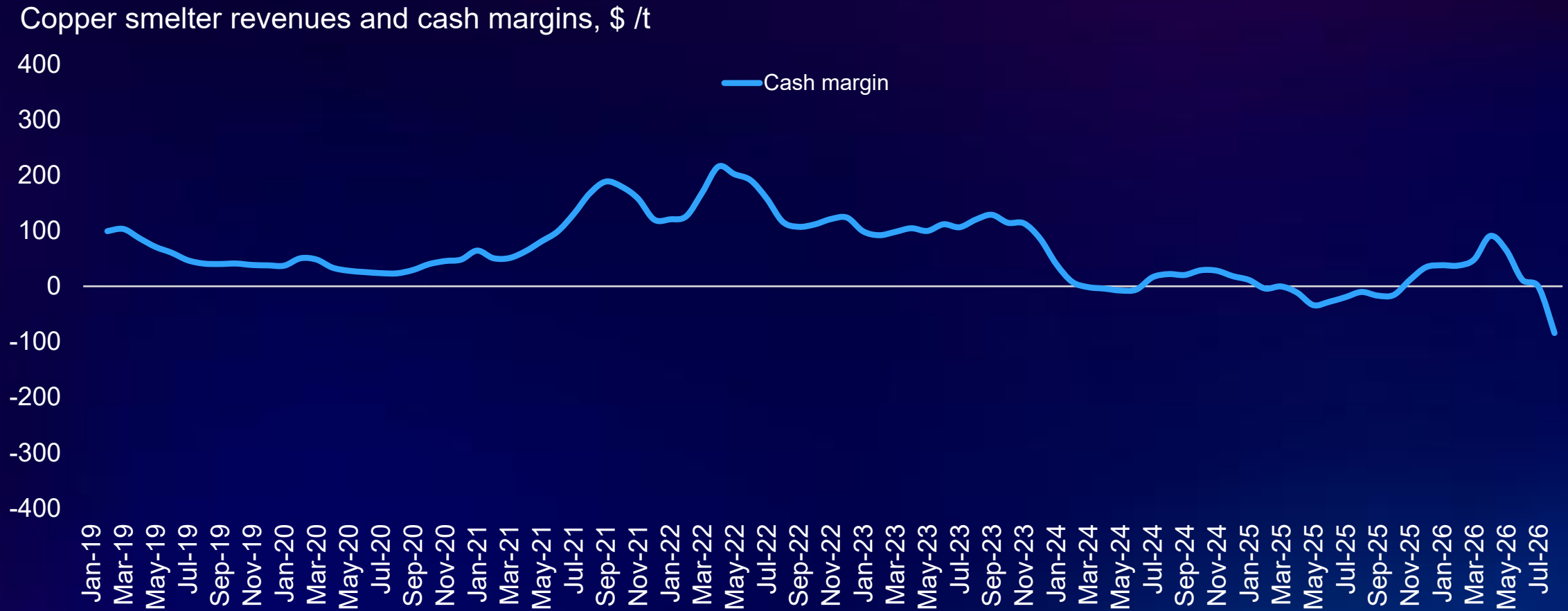
Copper concentrate weekly



Copper concentrate weekly spread (Miner/Trader - Trader/Smelter)



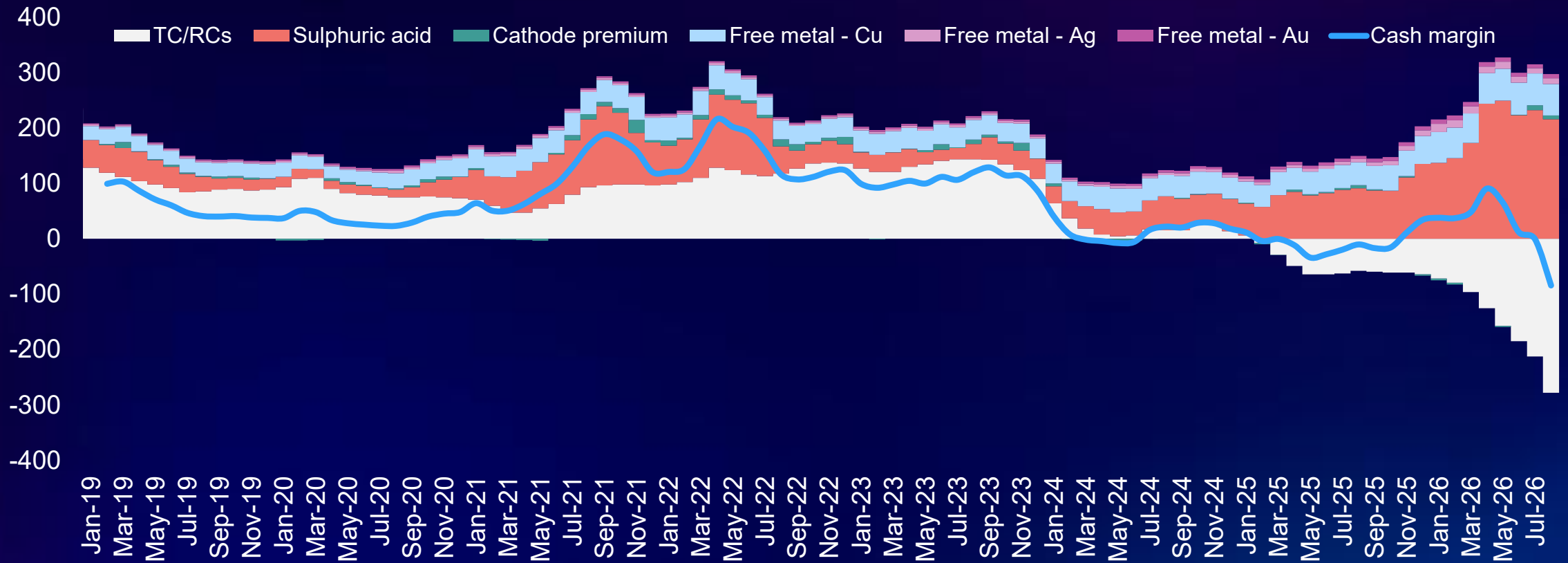
Helter smelter: Fast-changing economics of copper smelting



DATA: CRU Copper Concentrates Service

Helter smelter: Fast-changing economics of copper smelting

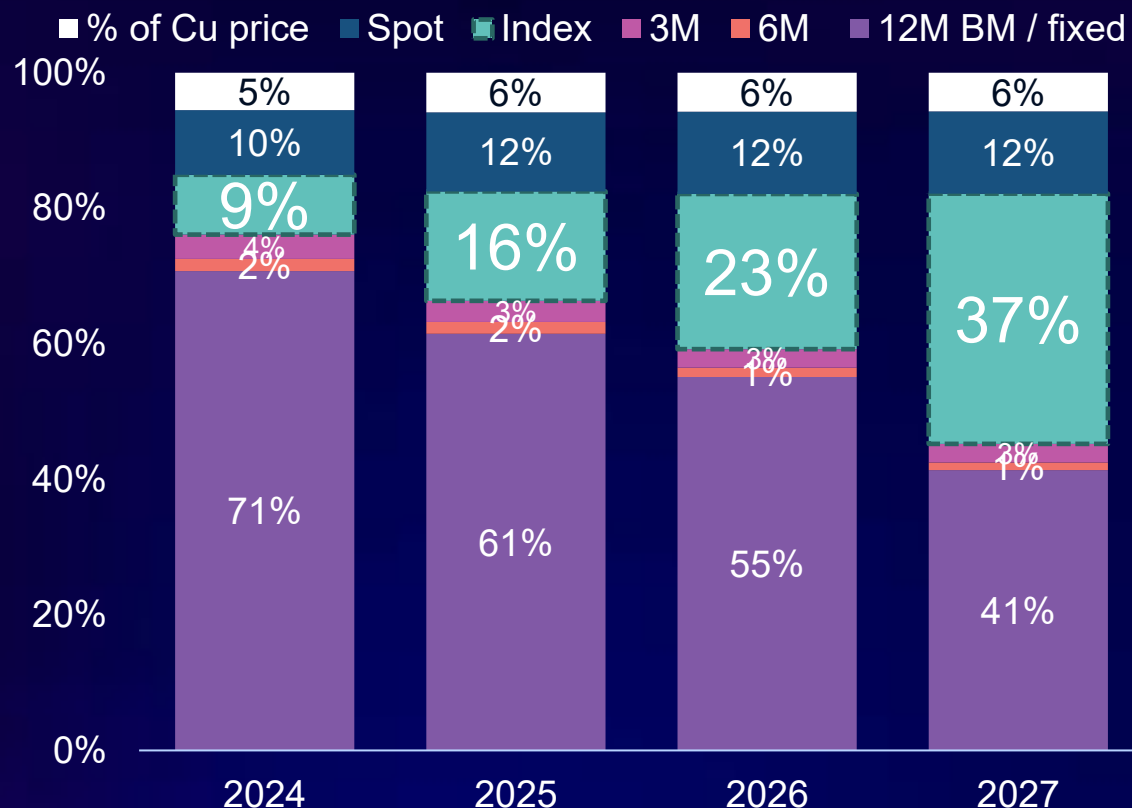
Copper smelter revenues and cash margins, \$ /t



DATA: CRU Copper Concentrates Service

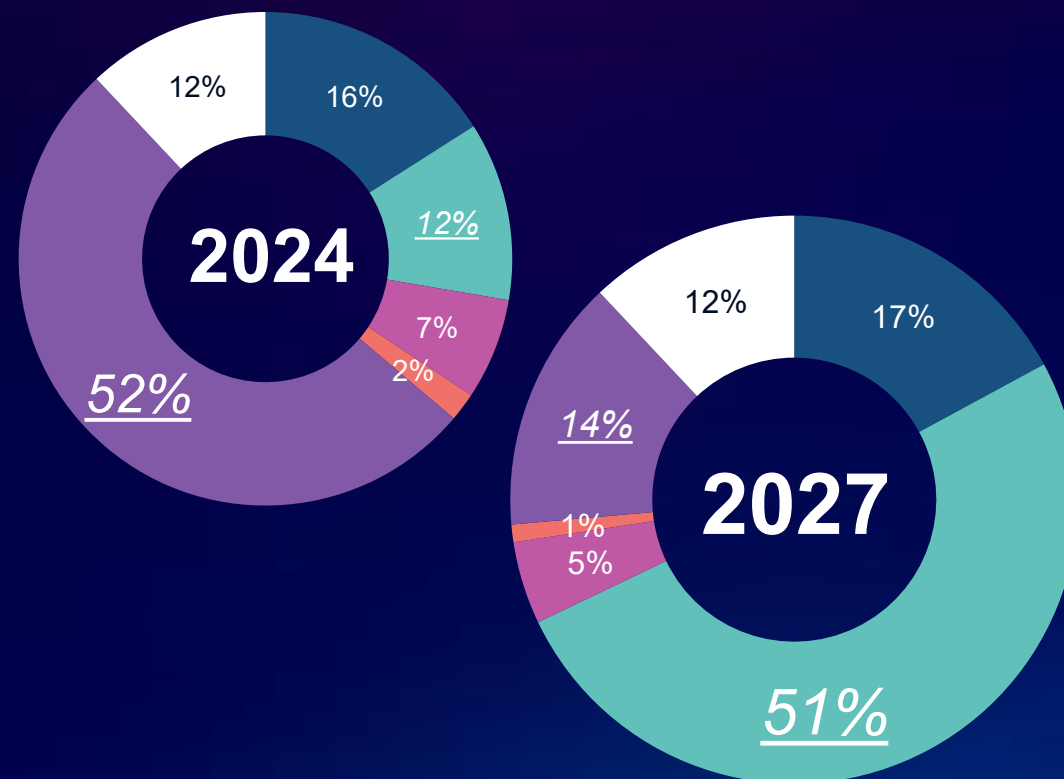
Copper concentrate pricing structure is quickly shifting

Global Cu concentrates market pricing structure, %



DATA: CRU Copper Concentrates Service

China concentrates market pricing structure



Shocks and trends: The power of nuanced pricing

Commodity prices have firmed through 2026. Market shocks are tangible and quickly priced. Price movement is demonstrating how industry structure is shifting.

Opportunity is captured through the **matrixed industry structure**...



Regional premiums demonstrate the impact of geopolitics, trade barriers and local fundamentals

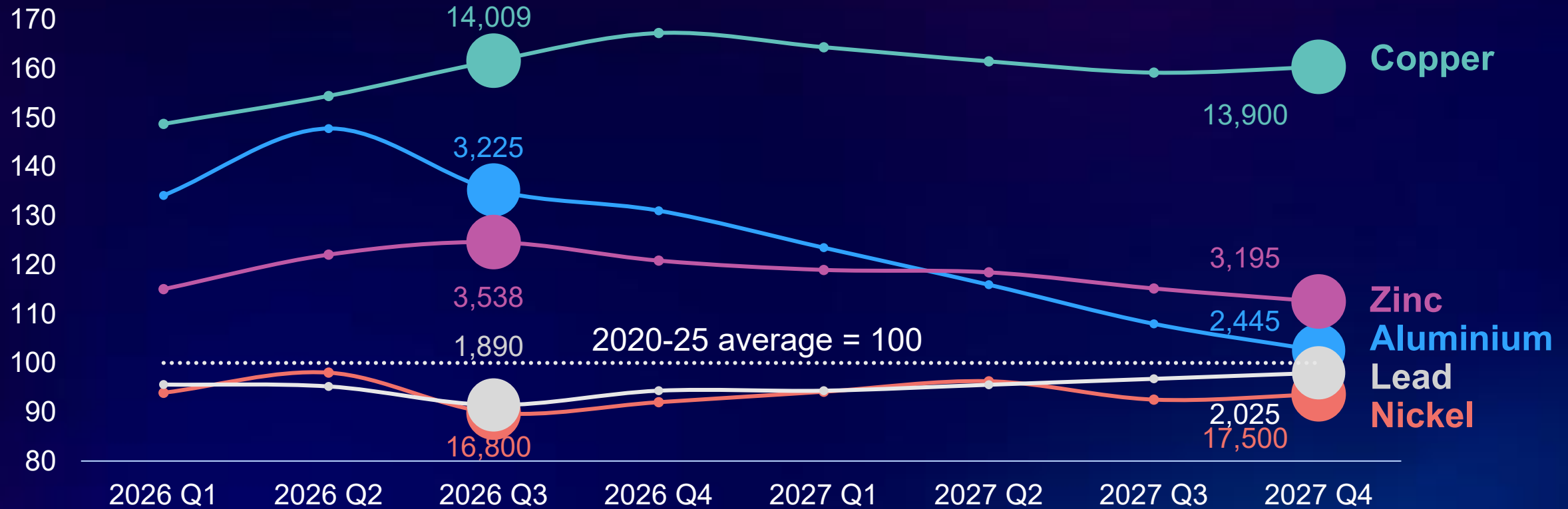


Supply chain dislocation is structural – the disconnect in mining and smelting investment is visible within current prices

But what is the outlook?

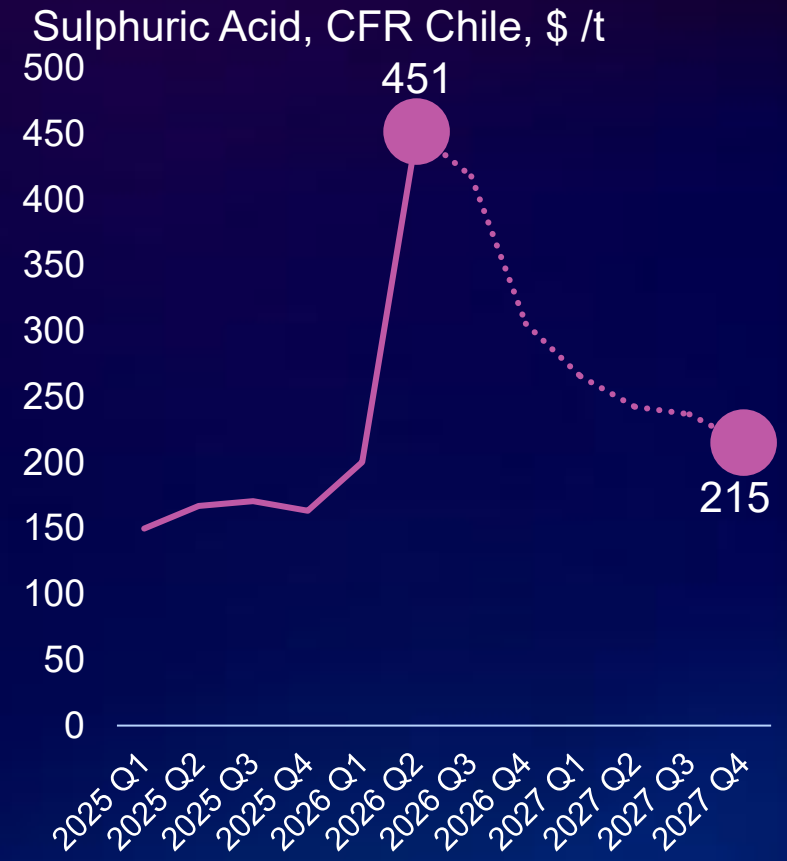
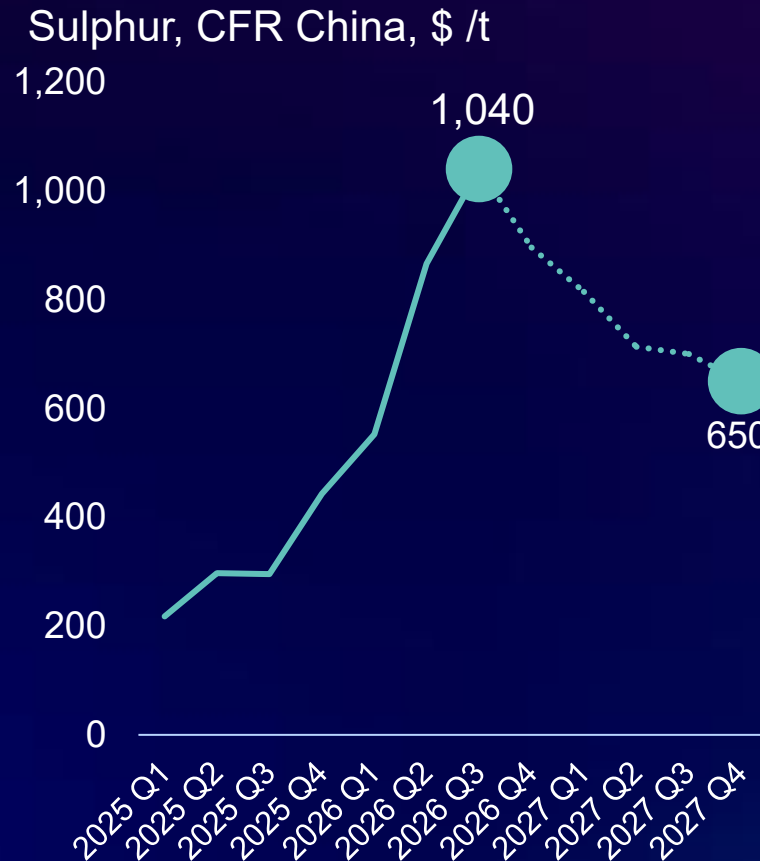
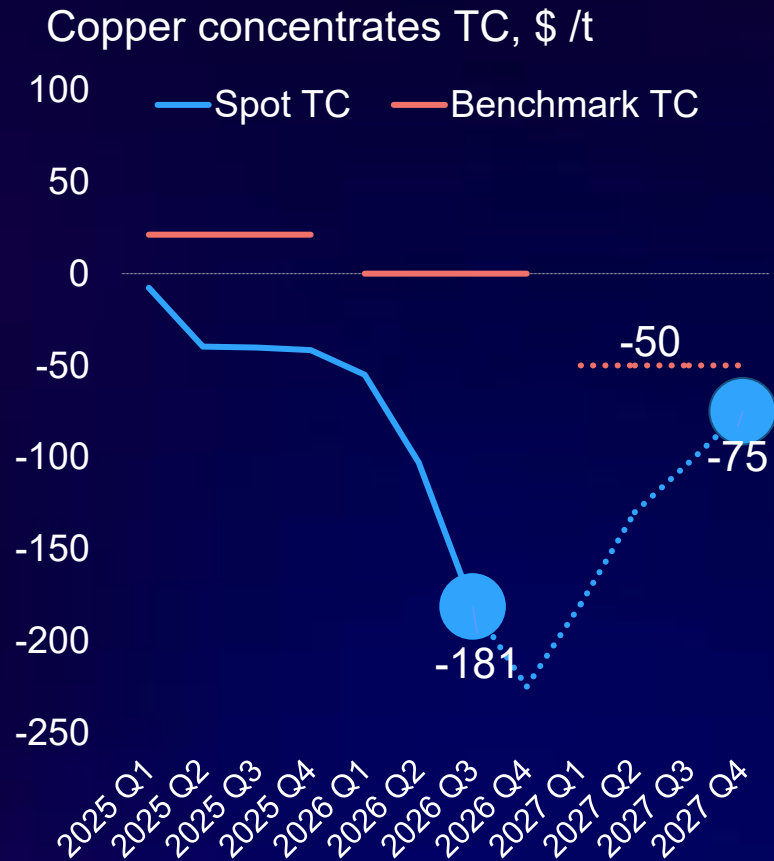
The outlook for the year ahead

3M LME Metals – Quarterly price outlook (nominal)



DATA: CRU Market Outlooks

The outlook for the year ahead: Raw materials



DATA: CRU Market Outlooks, Fertilizer Week NOTE: Concs. figures are for all concs., including integrated tonnes



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| Networking *break*

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Data, Insight,
Strategy &
Communities

| Welcome *back*

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Forging the Future - CRU's Global Outlooks

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HOST

Charlie Durant
Research Manager,
Analysis & Forecast



PRESENTERS

Sam Adham
Head of Battery
Materials, Analysis &
Forecasts



PRESENTERS

Jennifer Tong
Principal Consultant,
Consulting



PRESENTERS

Zaid Aljanabi
Head of Aluminium
Products, Analysis &
Forecasts



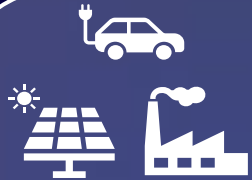
PRESENTERS

Frank Nikolic
Research Principal,
LME & Precious Metals,
Analysis & Forecasts

Forging the future: Metals demand in a changing world



Technology change is driving huge CAPEX spend. This is transforming risk, economies and commodity markets.



China's investment approach is transforming value chains, testing established investment models.



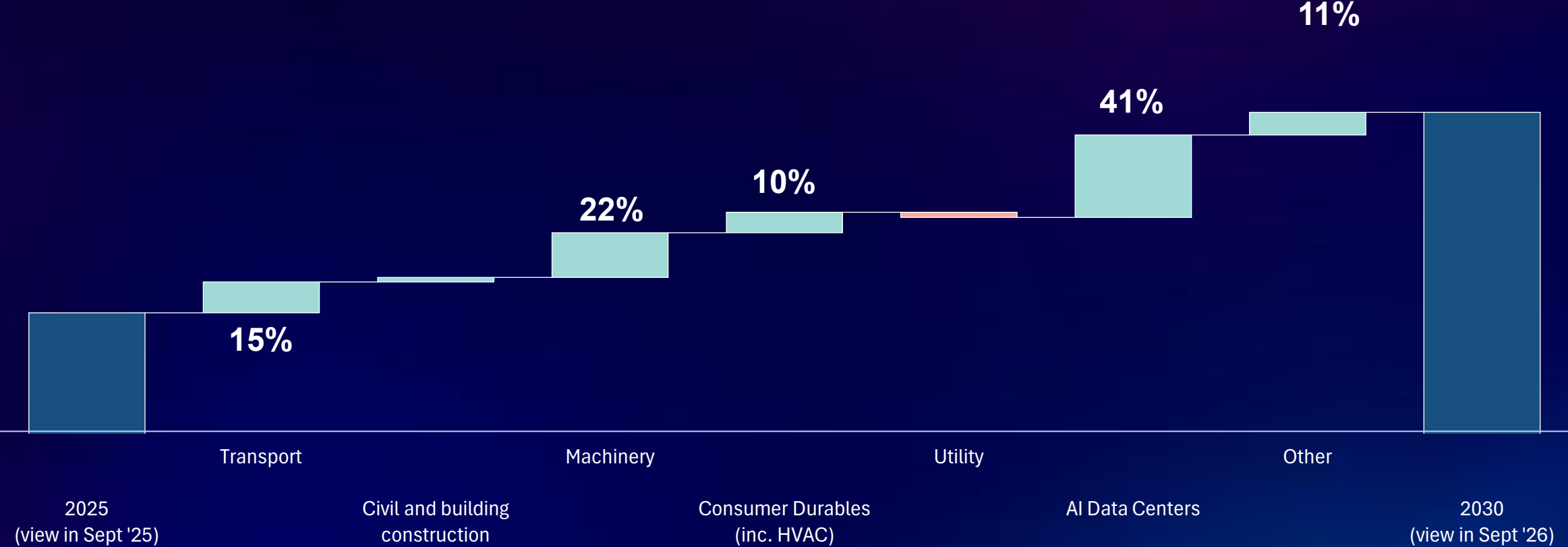
Risk, geopolitics and technology change continue to collide, shaping policies, metals demand and trade flows.

There are opportunities in this fractured world!



AI physical buildout has become the biggest driver of Cu demand

Copper Demand Evolution to 2030 (kt Cu)

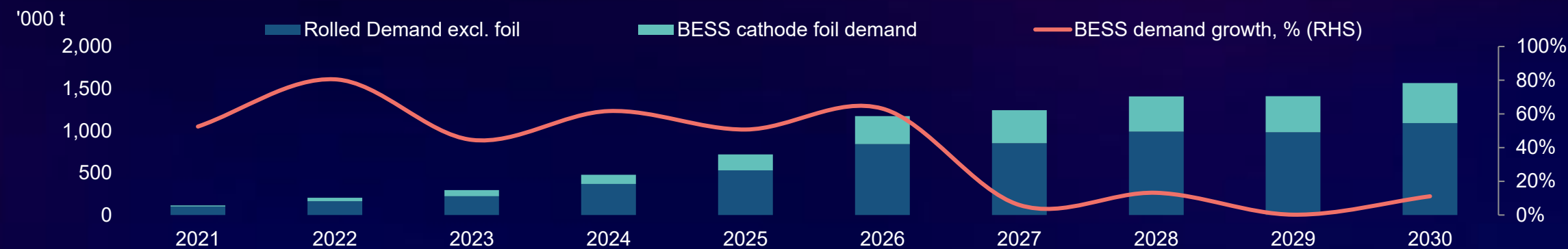


DATA: CRU Copper Market Outlook

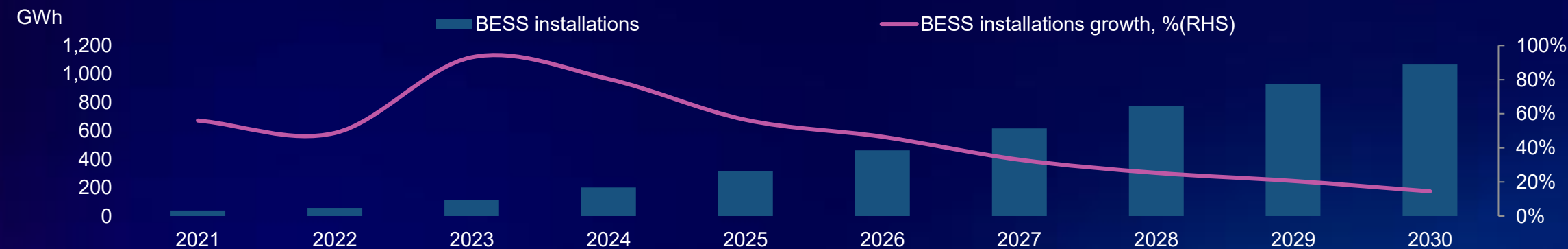


BESS industry maintains rapid growth for aluminium products

China's aluminium demand for BESS



China's BESS installation maintains growing



DATA: CRU

CRU

Mining



Refining



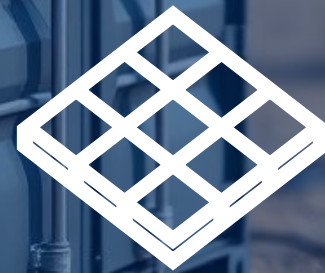
Materials



Cells



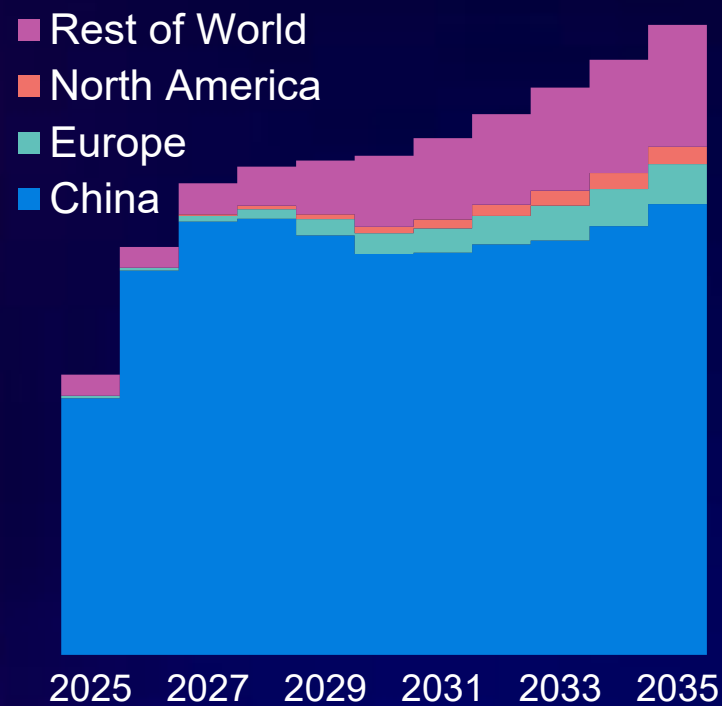
Systems



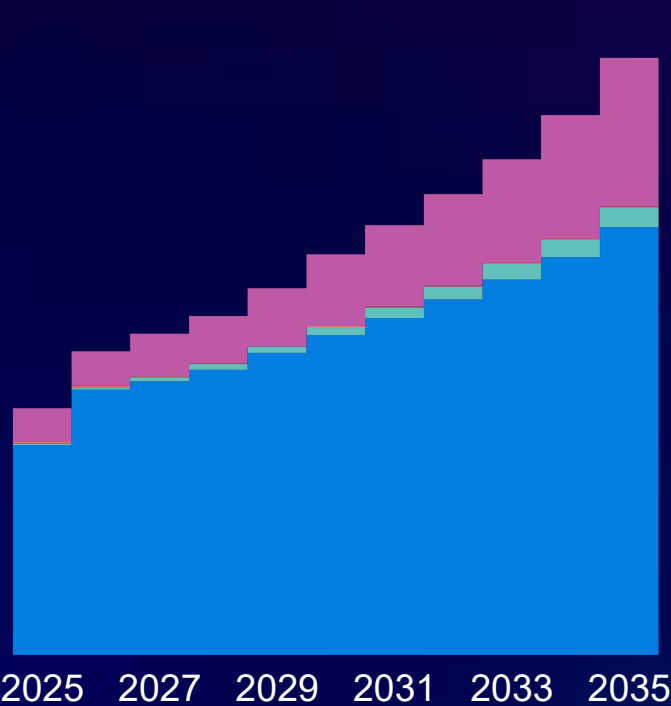


Geopolitics are bottlenecking the globalisation of battery metal demand

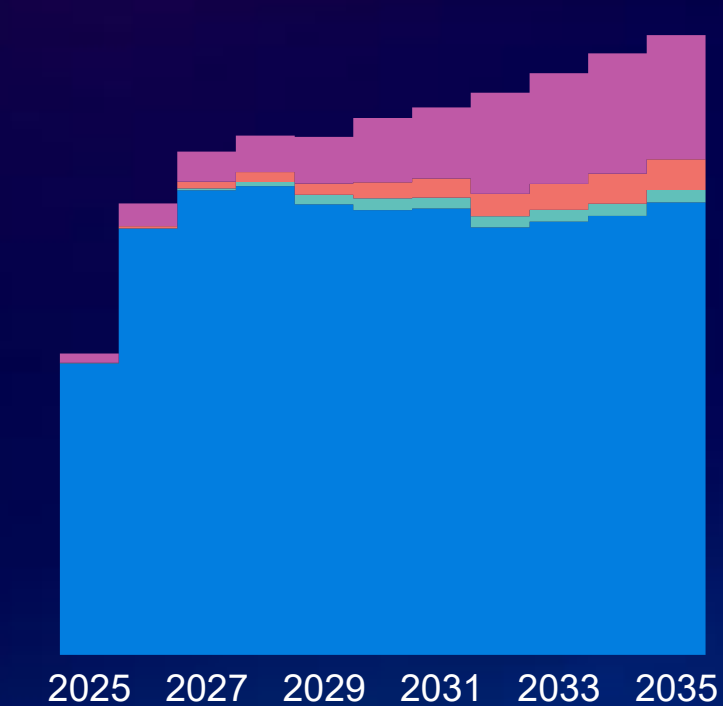
Lithium demand in regional cathode production



Nickel demand in regional precursor production



Graphite demand in regional anode production



DATA: CRU Battery Value Chain Service

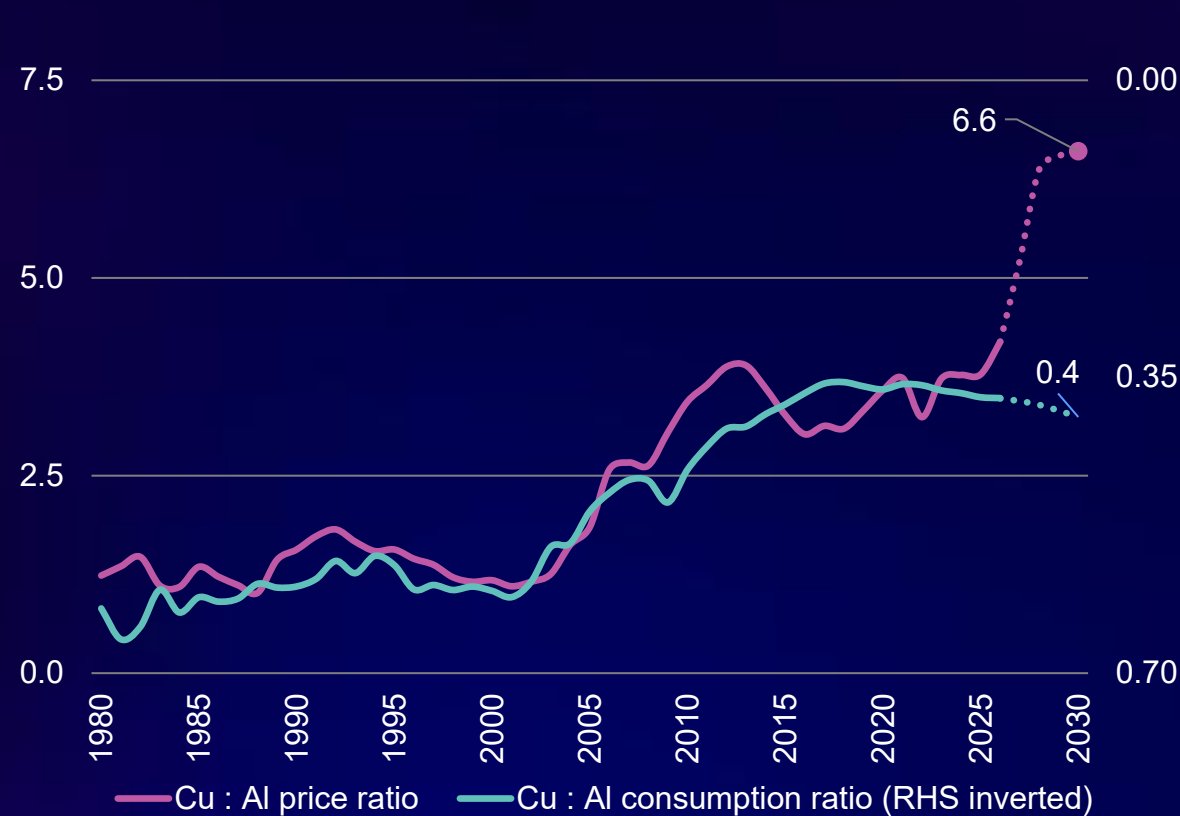
Geopolitical uncertainty, supply constraints and shifting demand drive varied strategies across the value chain

	Secure the metal	Defend the economics	Capture more value	Differentiate
WHAT CLIENTS ARE DOING	• Define material criticality and procurement response • Assess policy and trade flow impacts on supply • Secure supply through offtakes and investments	• Optimise feedstock, by-products and output mix • Review contract pricing structure	• Integrate mines, smelters and refineries • Access new margin pools through processing complex concentrates, recycling and downstream products	• Consider expansion into higher margin products required for new growth areas • Build low-carbon, traceable propositions • Manage substitution risk
HOW CRU'S SUPPORTING	• Critical mineral risk assessment and metal market capability (e.g. automotive OEM) • Policy implications • Offtake structure recommendation and M&A due diligence	• Smelting and refining strategy (e.g. Mount Isa routes to smelter profitability) • Commercial contract review	• Value-chain expansion assessment and market entry studies • Value chain economics where mining margins offset processing.	• Premium product market assessment • Data centre sustainability (e.g. Meta) and sourcing strategies • Substitution risk assessment



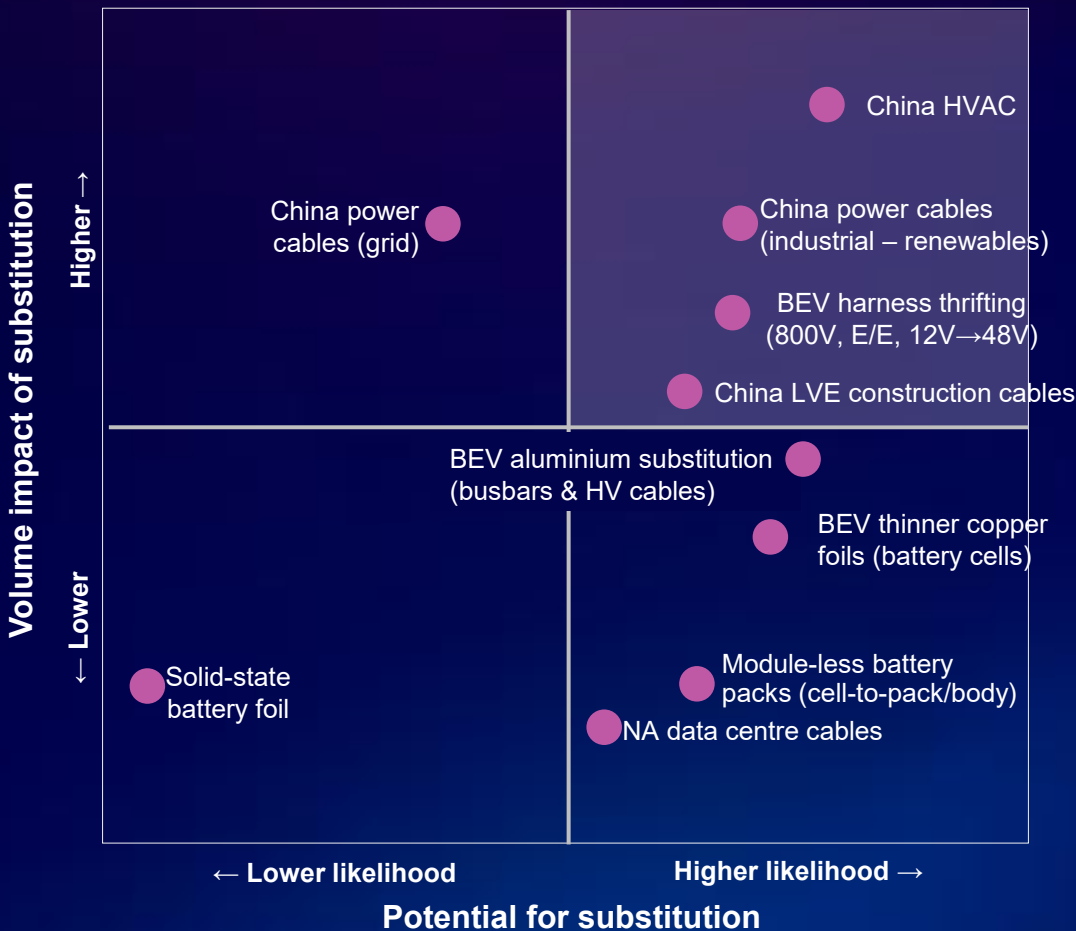
Cu price trajectory encourages substitution and demand destruction

Cu to Al price and consumption ratios



DATA: CRU Copper Market Outlook, CRU Aluminium Market Outlook

Cu Substitution Risk



Meet the presenters | *Fault lines in supply*



HOST

Kaitlin Gebbie
Senior Consultant,
Strategies



PRESENTERS

Nikhil Shah
Principal, Nickel Market
Service, Analysis &
Forecasts



PRESENTERS

Martin Jackson
Head of Battery Material
Markets, Analysis &
Forecasts



PRESENTERS

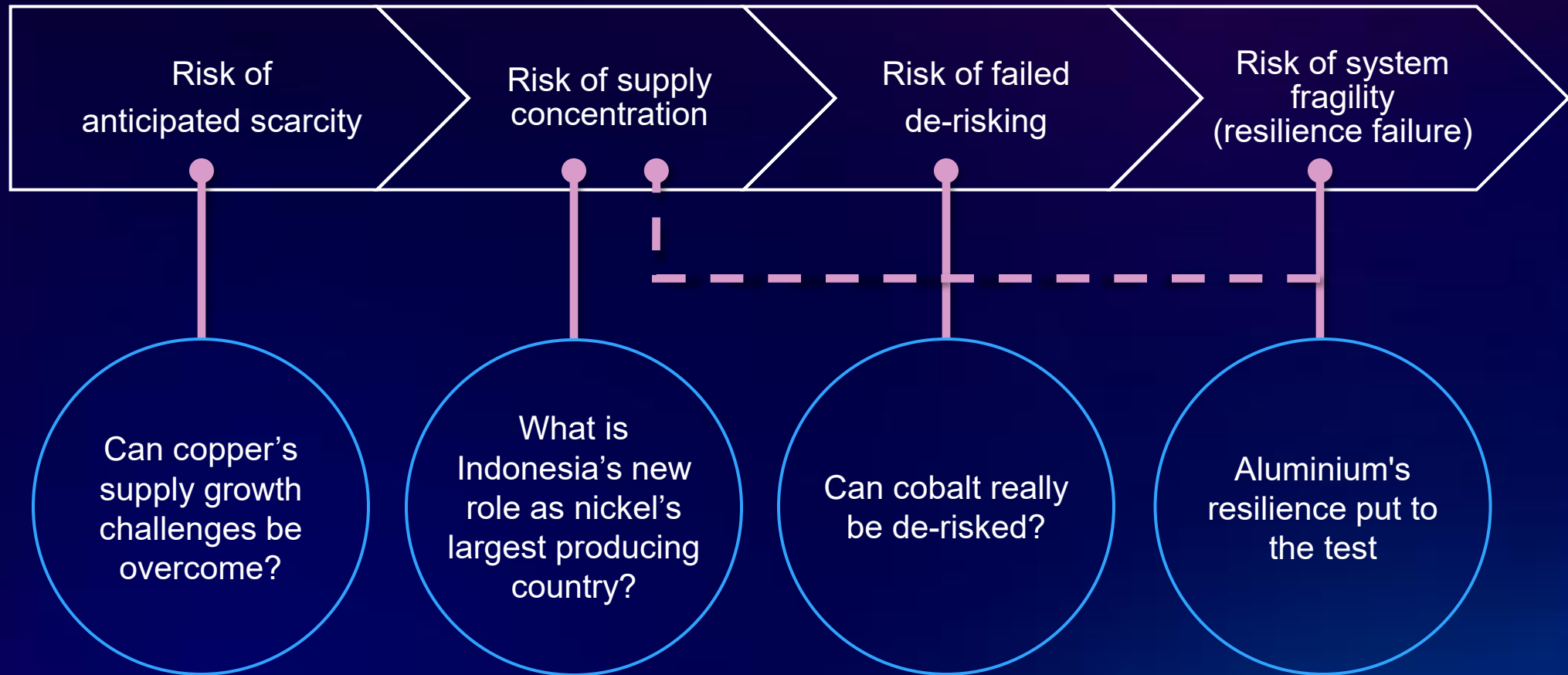
Erik Heimlich
Head of Copper & Zinc
Markets, Analysis &
Forecasts



PRESENTERS

Wan Ling
Research Principal,
Aluminium, Analysis &
Forecasts

Fault lines in supply: The age of risk management

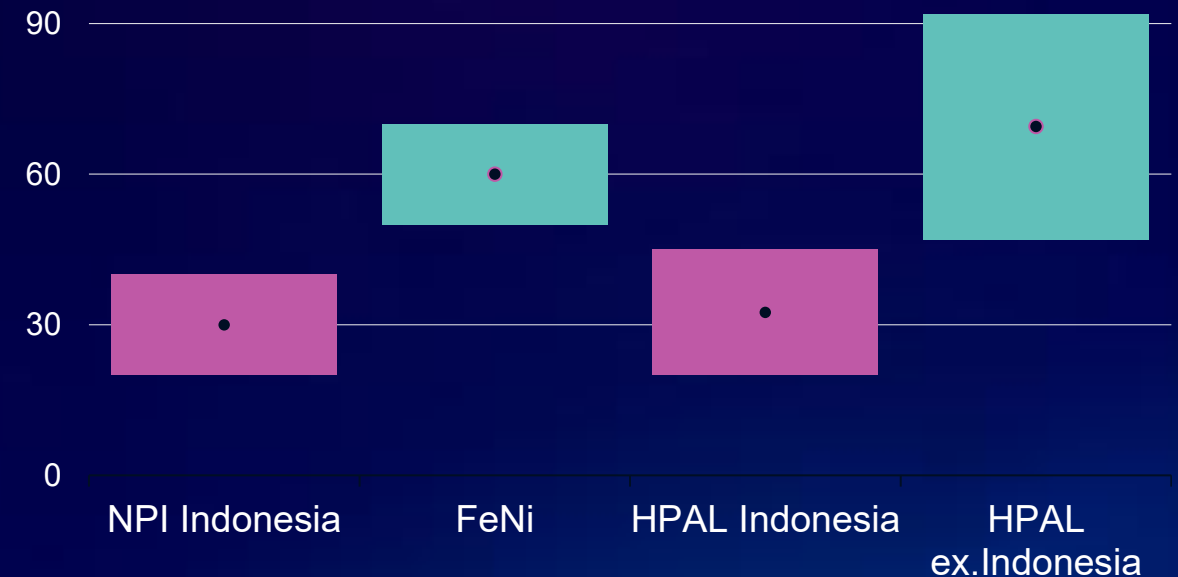


Indonesia to remain dominant in nickel supply

Nickel mine output, Mt



Indonesia's capex advantage (\$ '000 capex /t installed Ni capacity)



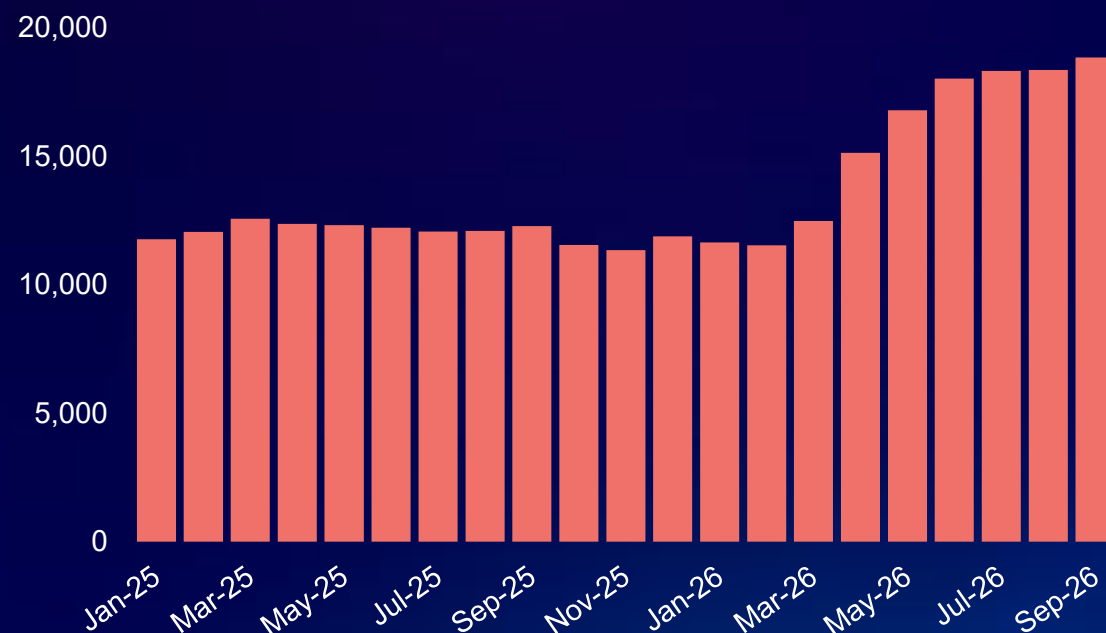
DATA: CRU Nickel Market Outlook

Sulphur costs challenge HPAL margins

Index of sulphur and cobalt price, Jan 2025=100



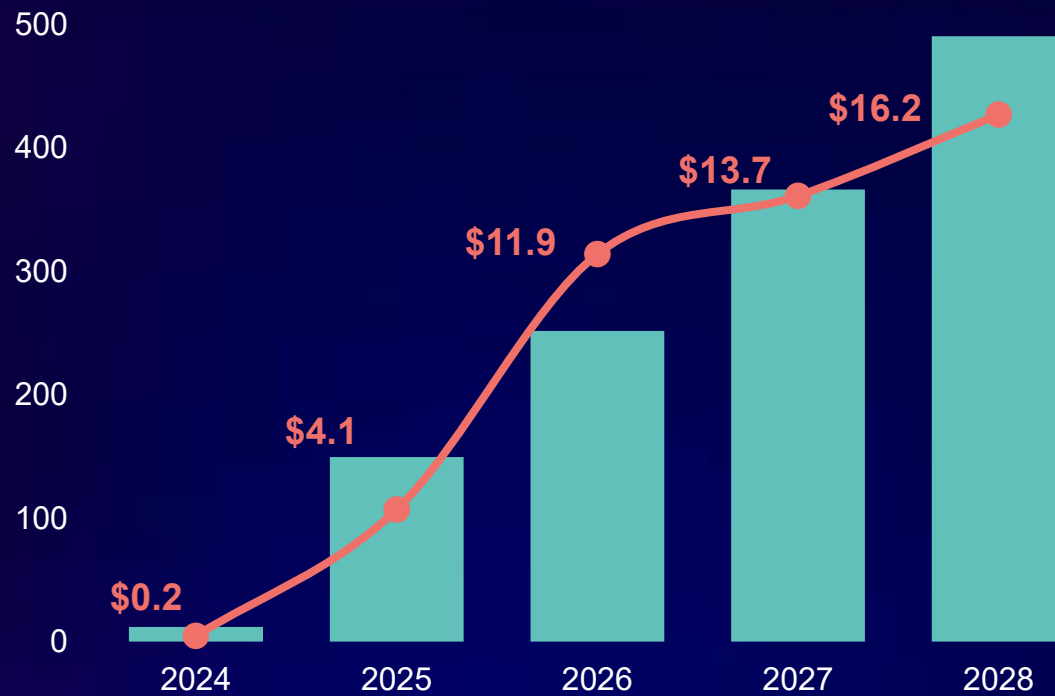
Cost of producing nickel metal from MHP in Indonesia, \$/t (at spot sulphur price)



DATA: CRU Nickel Market Outlook

Fault lines: Cobalt's clash with geopolitics

DRC stock build, kt Co (Column, LHS), & value contained, \$ bn



DATA: CRU Cobalt Market Outlook

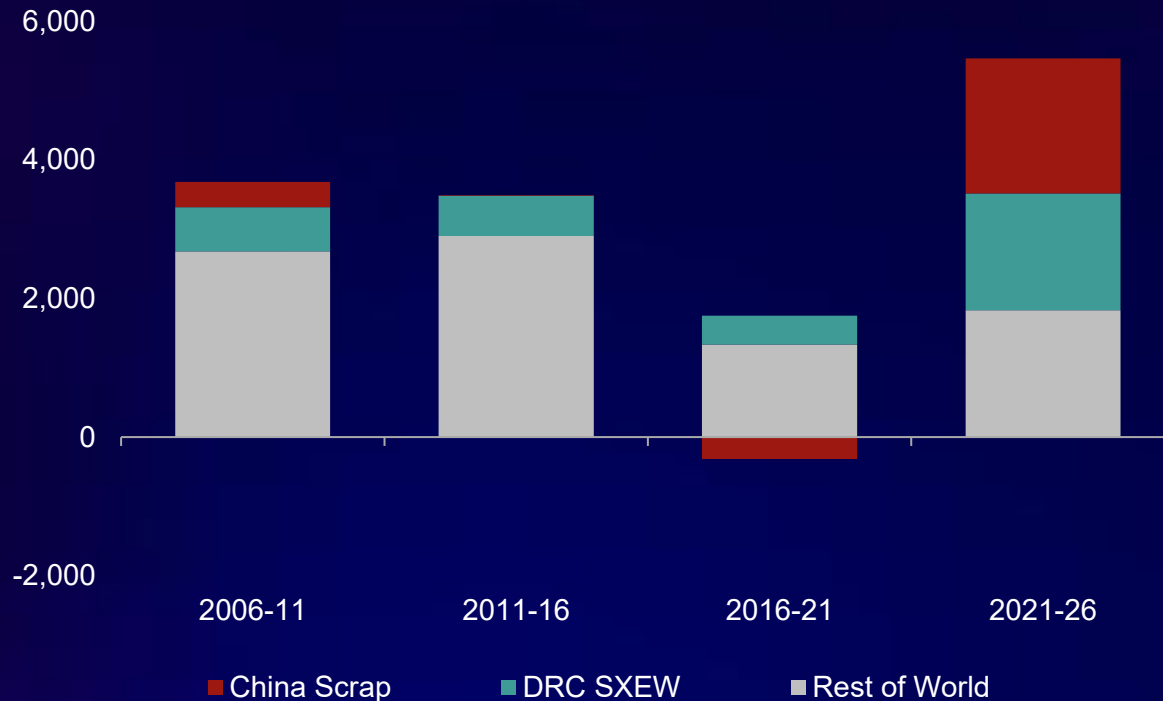
Can cobalt really be de-risked?



Copper's capacity challenge: Beyond short-term volatility

The DRC and Chinese scrap drove recent growth; future supply depends on mine projects not yet sanctioned

Cumulative growth in refined copper production, '000 t



Copper mine production, '000 t

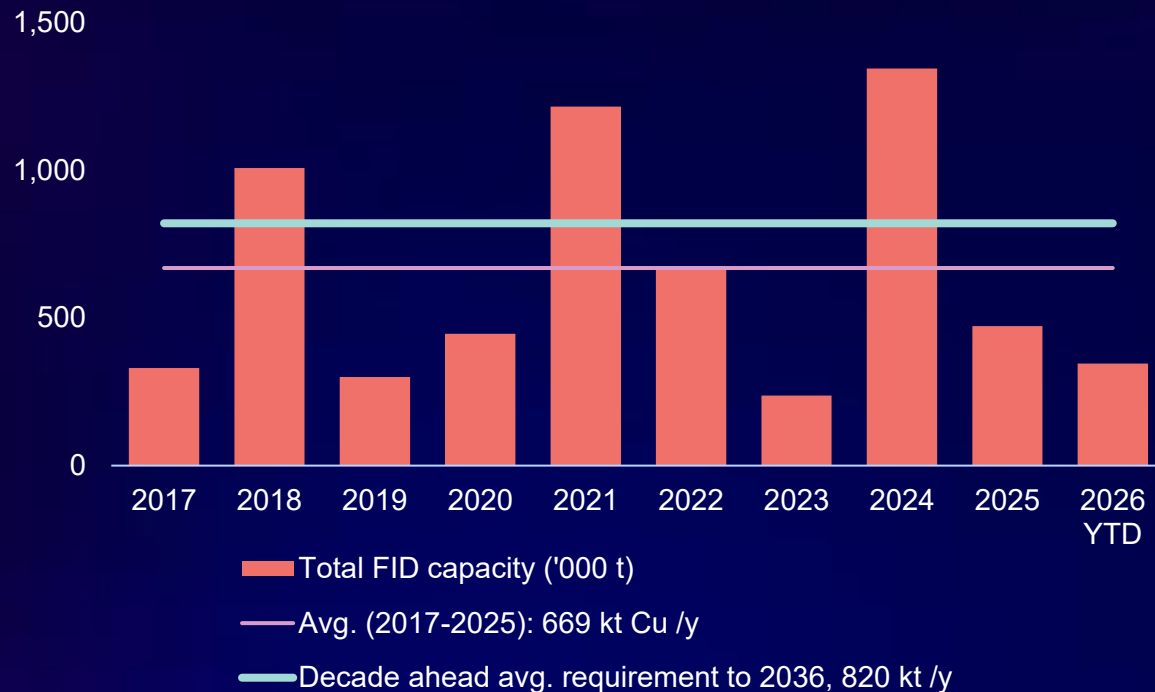


DATA: CRU Copper Market Outlook

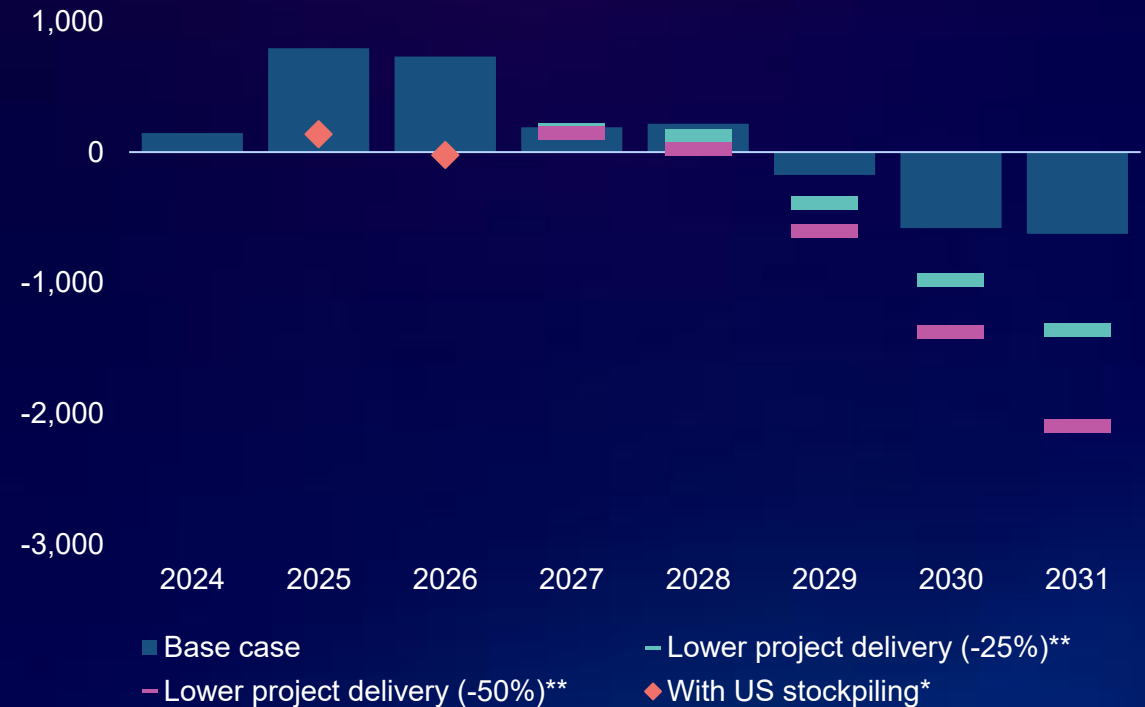
Project delivery is a critical risk to copper supply

Approvals falling short of requirements; without unsanctioned projects, deficits reach several million tonnes

Copper mine project approvals, '000 t /y of capacity approved



Refined copper market balance, '000 t



DATA: CRU Copper Market Outlook. Notes: * Adjusted for US stockpiling. ** Output from uncommitted mine projects reduced by 25% and 50% versus the base case.

Increased Chinese investment abroad to drive production growth

China is accelerating investments in smelting projects in Indonesia and Angola



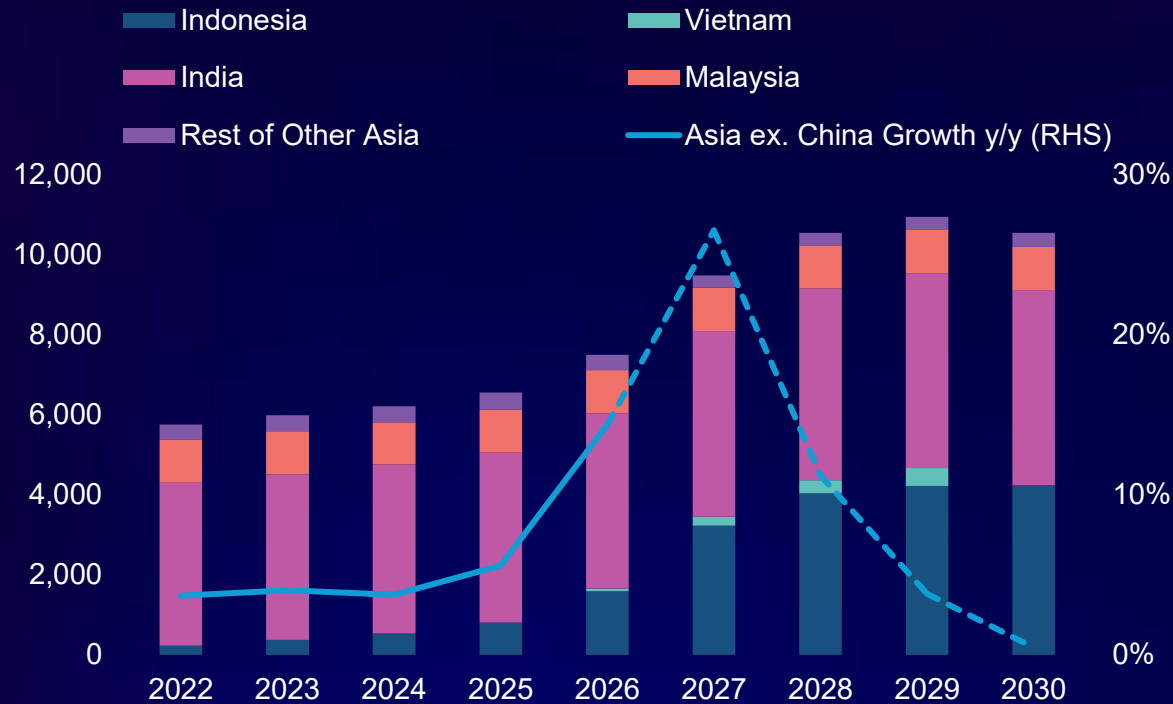
China-backed projects to bring landscape change in the global aluminium supply:

- Chinese companies actively invest in the aluminium smelting projects in ex. China countries – primarily in Indonesia, Angola, Middle East.
- Indonesia would become the largest aluminium production country ex. China.
- Most of Chinese-backed projects are applying for LME approved brands.

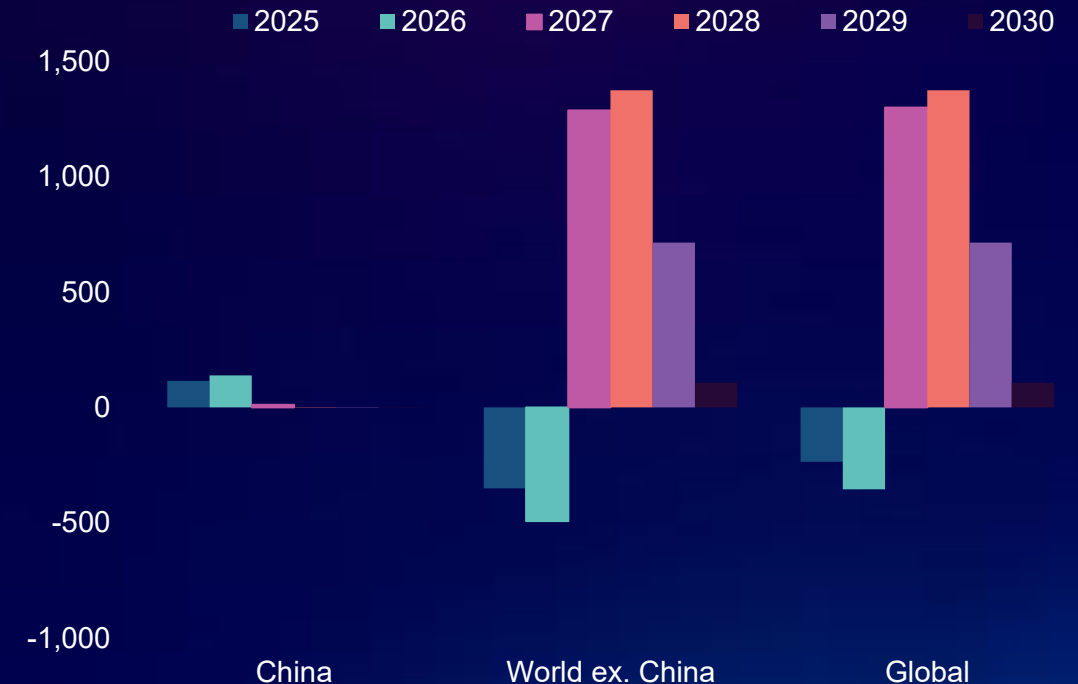
DATA: CRU Aluminium Market Outlook. Values shown are capacity. *Multiple phases included in capacity number. ** Not in CRU base case.

New projects to bring surplus to the market

Asia ex. China nations primary aluminium production, '000t



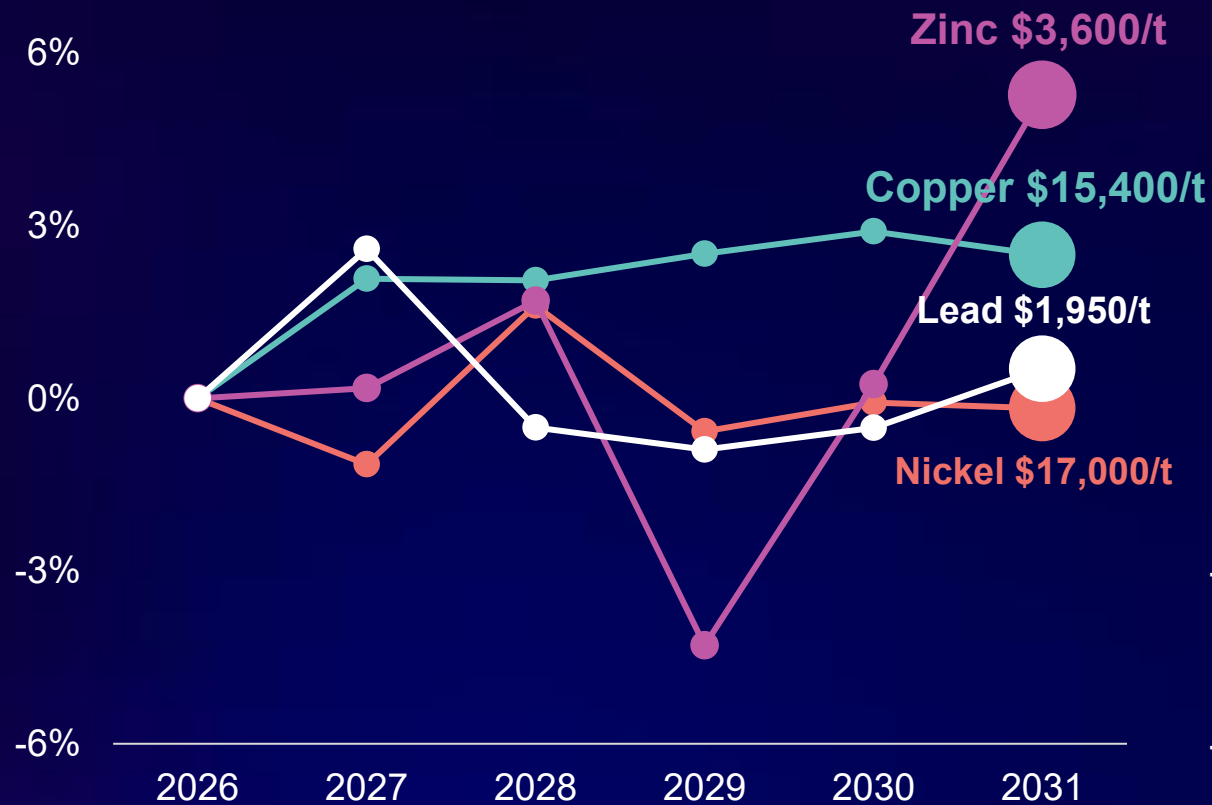
Projected world balances 2025–2030, '000t



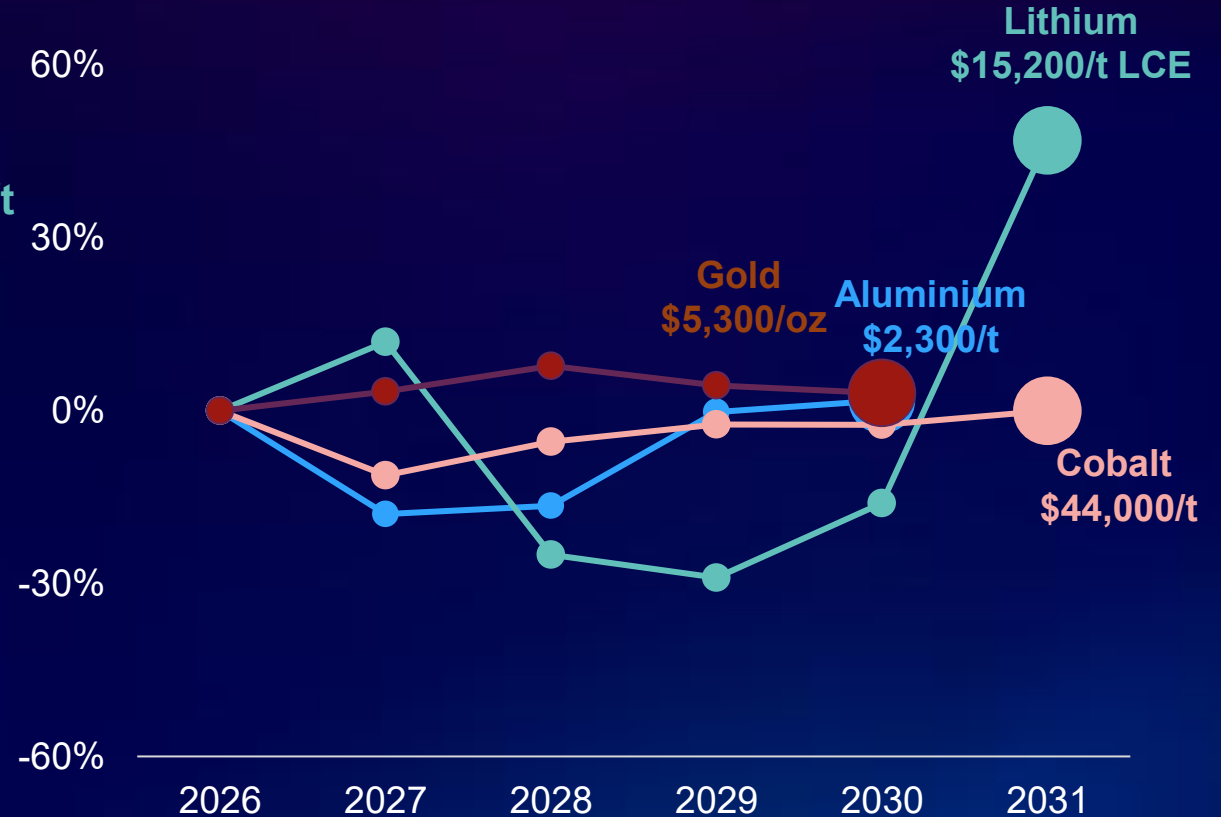
DATA: CRU Aluminium Market Outlook

Market dynamics over the next five years

Price index for select metals (2026=0%)



Price Index for select metals (2026=0%)



Note: Prices are rounded; Lithium prices reference carbonate China spot prices ex. VAT, all others refined metal basis

DATA: CRU named commodity Market Outlooks



Data, Insight,
Strategy &
Communities

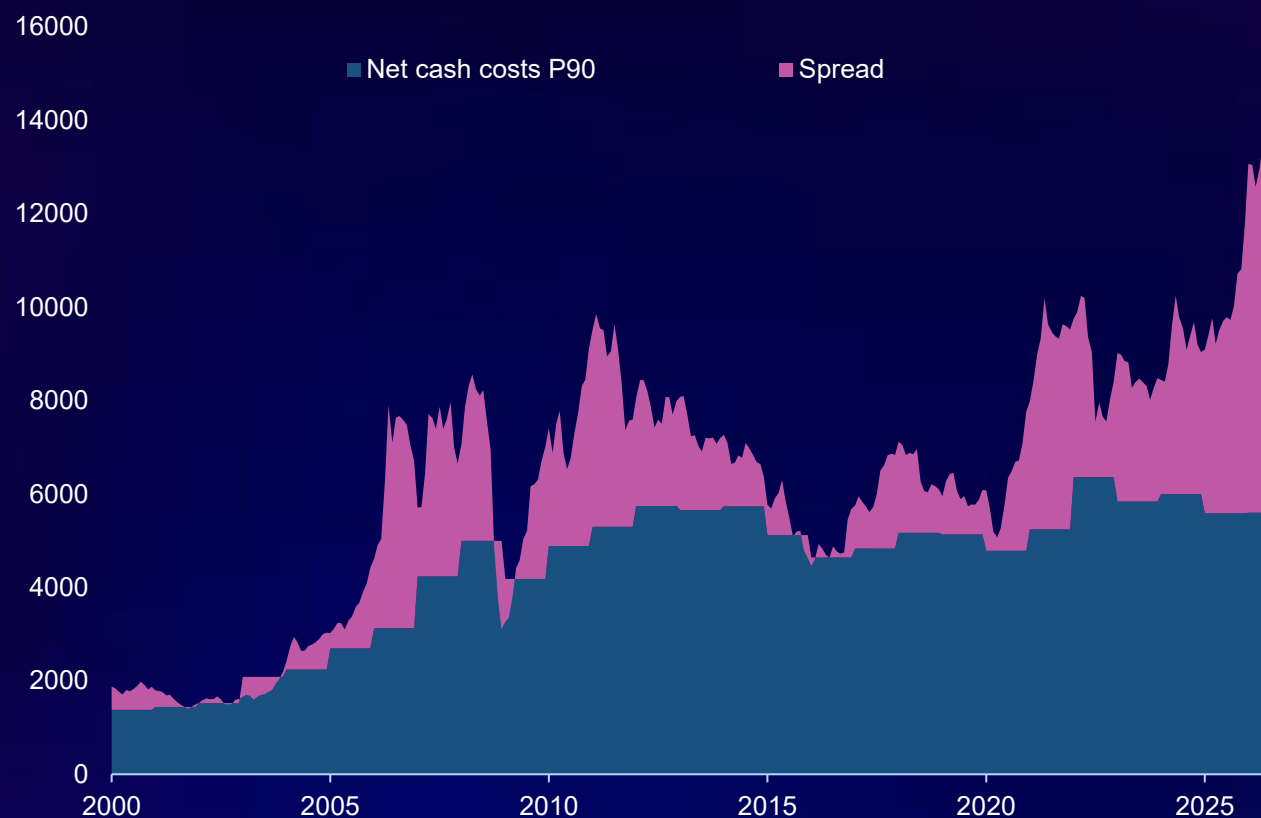
Creating Value in Uncertain Times

Ben Carstein, Asset Data Product Manager

CRU. Independent *expert* intelligence

Copper industry continues to enjoy strong cash margins

Copper margins over net cash costs 90th percentile, US\$/t

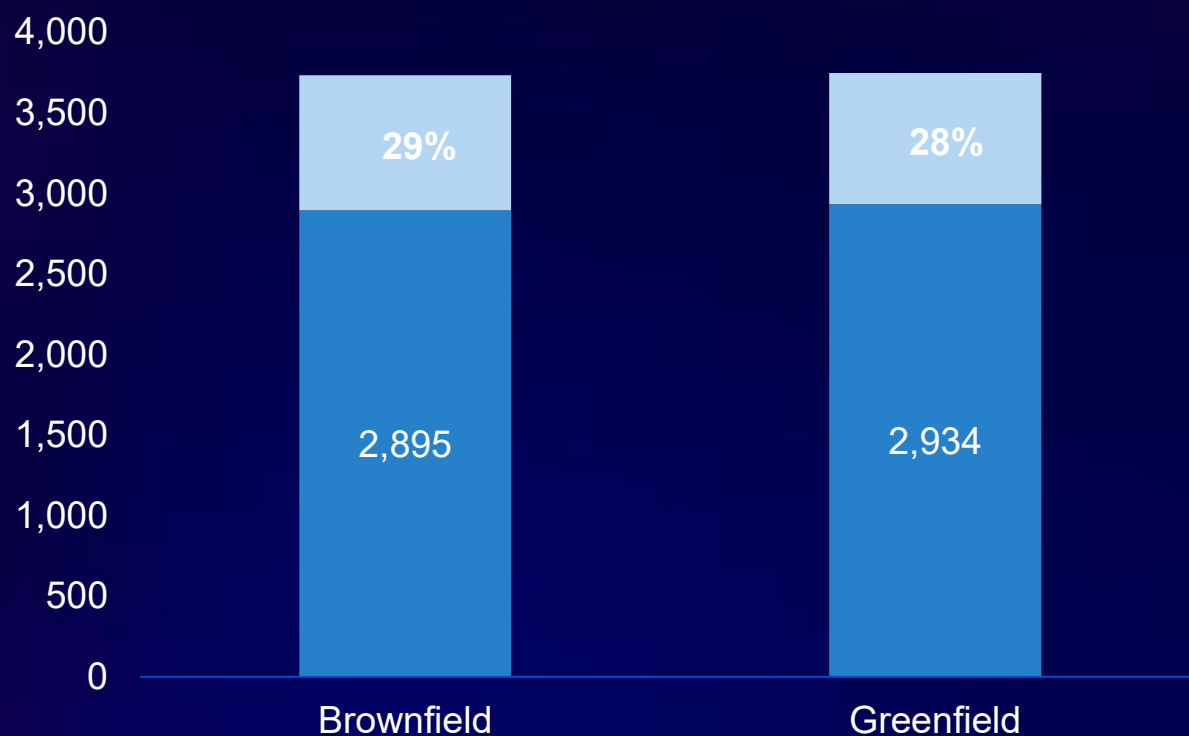


DATA: CRU Asset Platform

- Prices have been consistently above operating cash cost support for the last two decades.
- Cash margins currently at historic high levels.
- Pricing today reflects scarcity premium and expectations on long-run marginal costs.

But has the industry created value?

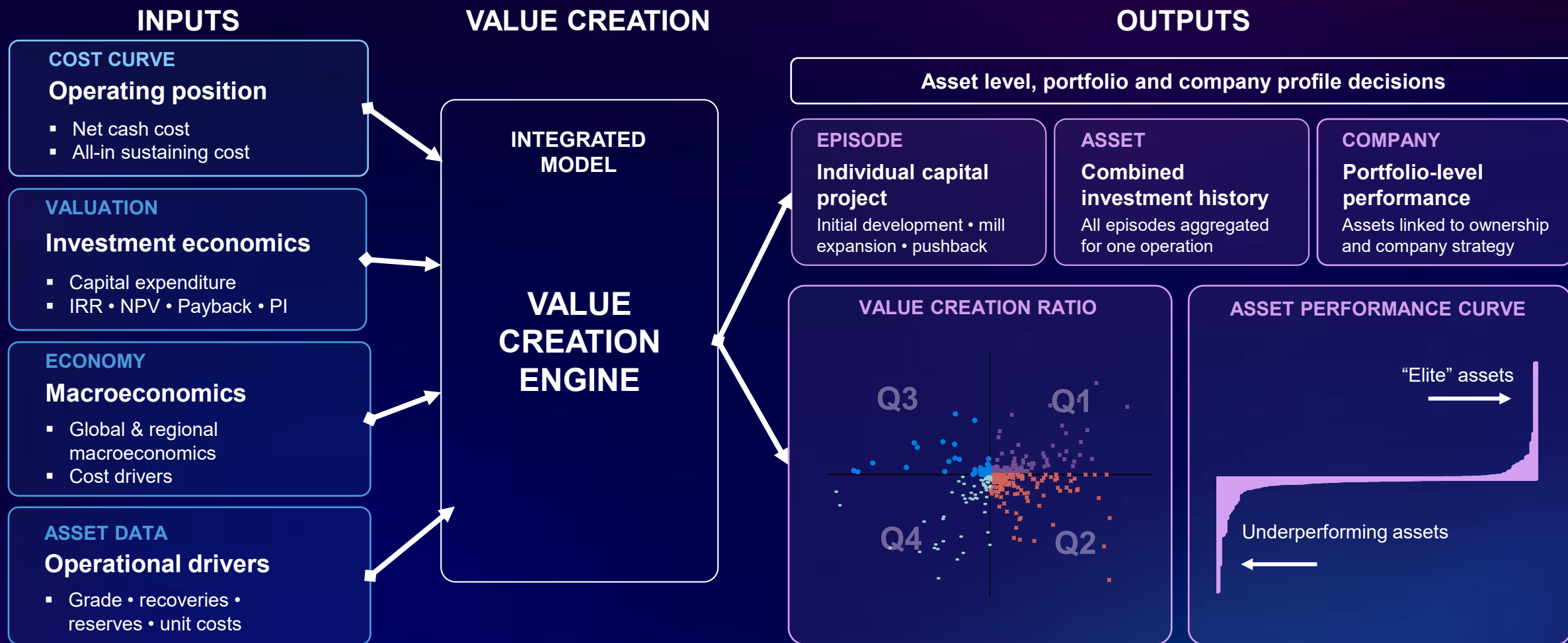
Average CAPEX spend (\$M) and overrun (%), selected copper projects > \$1 bn 2010-24



DATA: CRU Copper Long Term Outlook. *Real terms.

- Between 2010-24 average capex overruns of ~30%
- Capex intensity up 15% y/y in 2026 and 38% this decade*
- Projects facing long lead times and risk of delays from permitting and other unforeseen challenges
- \$169 billion in project CAPEX required to meet supply gap by 2036

CRU's approach to answering this question



What do the preliminary results show?

Value creation ratio (absolute and controllable)



We've reviewed over 400 copper mine investments (greenfield, brownfield, mine life extensions) between 2007–2026.

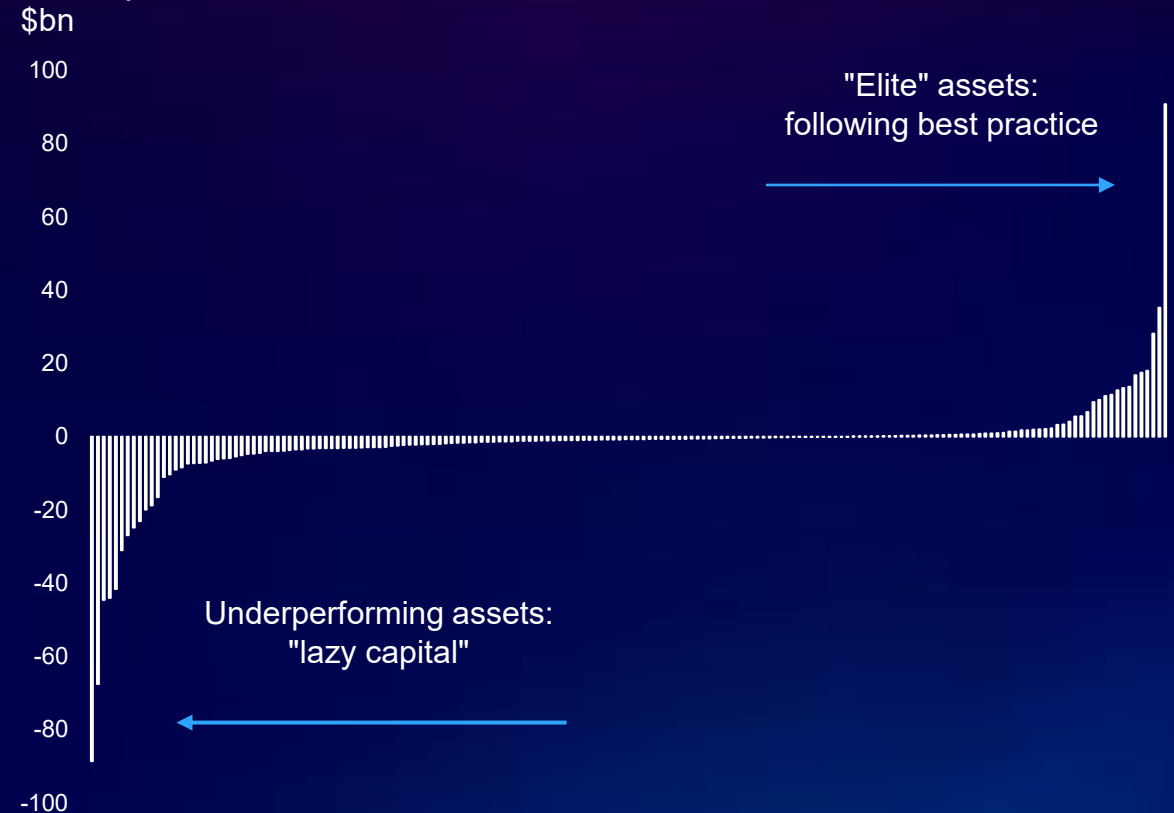
In development results show:

- Majority of projects created 'value'
- Significant number of projects would not have created value, if not for higher prices post-completion
- Significant share of projects resulted in value destruction (Q3 and Q4)
- Small share would have created value if not for price declines (Q3)
- More than half did not show value creation once market impacts are excluded (Q2 and Q4)

What about opportunities for future value creation?

- We evaluate the current performance on productivity and cost, according to mine type and geology, to inform potential for future value creation.
- Preliminary results show:
 - Many assets perform close to benchmark.
 - Significant minority of underperforming assets – potentially representing opportunities to create value.

Asset performance curve: Current v Benchmark value



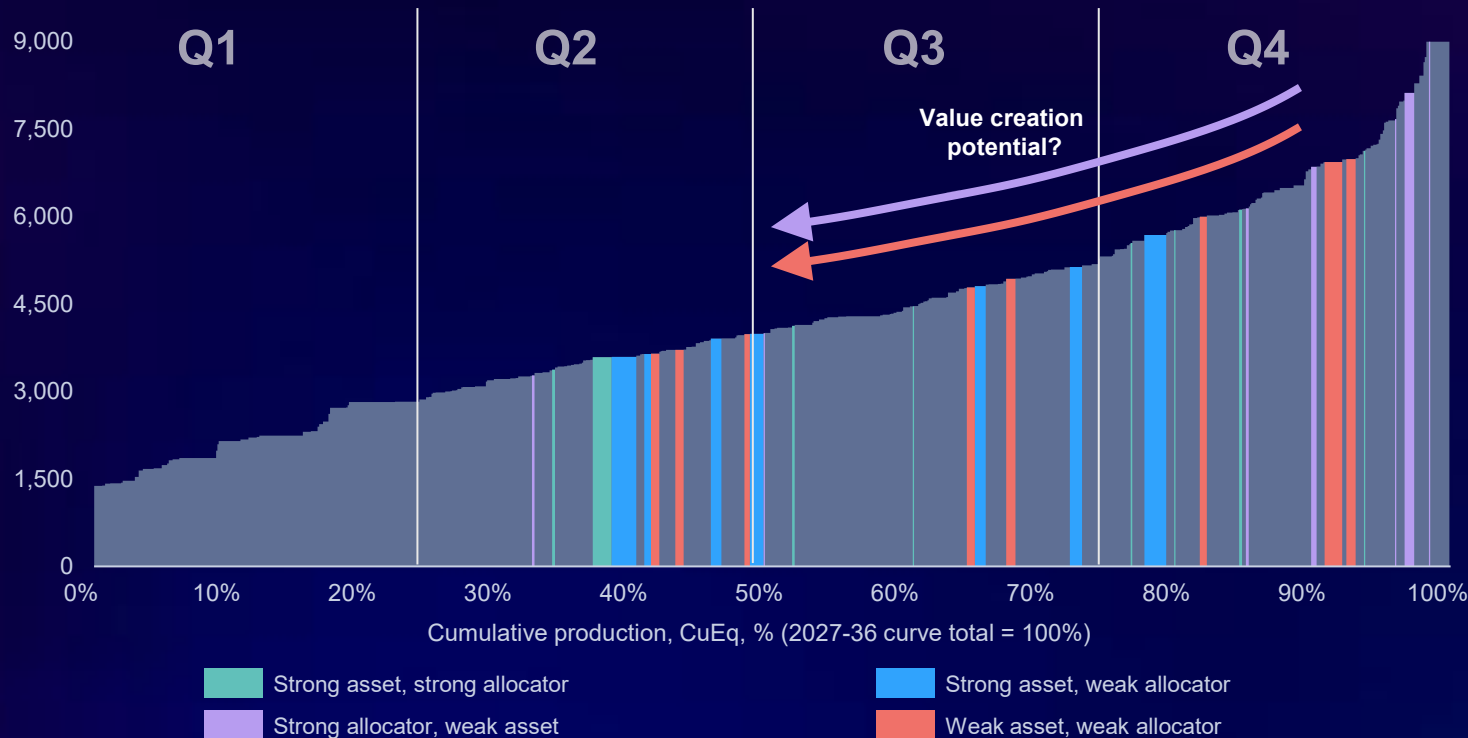
DATA: CRU

Combining past value creation and current performance



How do our new measures interact with traditional metrics?

Copper mine cash costs, excl. royalties, pro-rata (CuEq, \$/t)



- Past value creation not correlated with the cost curve
- Future value potential is correlated with cost curve position, with underperforming capital expectedly sitting higher on the cost curve

DATA: CRU

- Cost curves provide a good a measure of margins and asset competitiveness, but do not necessarily equate with overall value creation.
- We recommend evaluating opportunities according to a broad range of metrics from our Asset Service suite, including cost curve position, margin, NPV, IRR, cash flow generation, technical and productivity benchmarking, emissions and ESG risks etc., in addition to future new measures such as past and future value creation.
- CRU is broadening the tool kit available to help support decision making in this space and we welcome feedback on what measures can best help you in your role.



Chris Asgill

VP, Market Analysis & Forecasts



Data, Insight,
Strategy &
Communities

Save the date

CRU Breakfast
19 October 2027

CRU. Independent *expert* intelligence