CRU

Data, Insight, Strategy & Communities

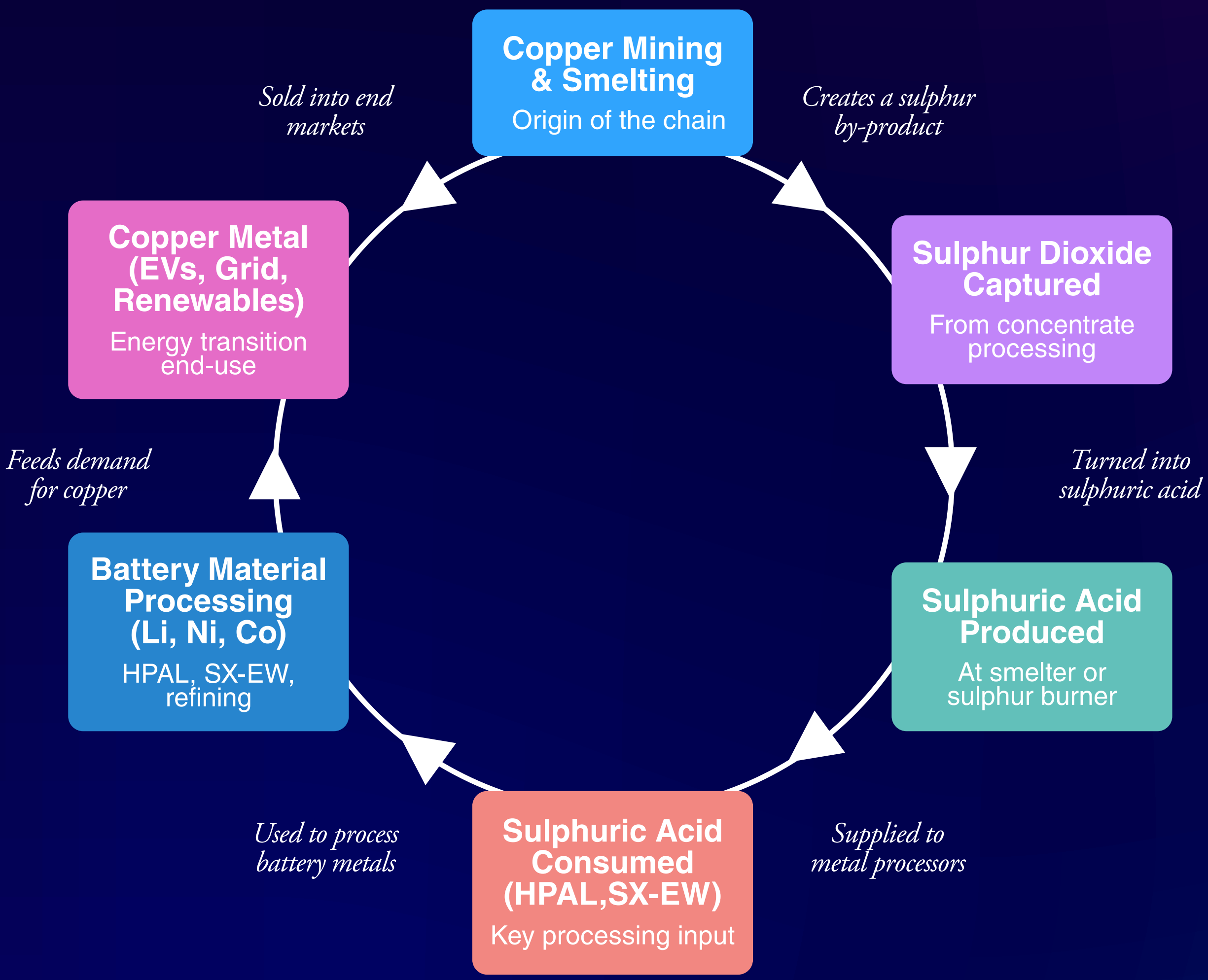
Connected Intelligence

Copper | Sulphur | Sulphuric Acid | Battery Materials

Access a connected view of commodity markets that no longer move independently

Commodity *connections shaping* the energy transition

The energy transition has fused four commodity markets into a single, interdependent supply chain. Disruptions in one market now transmit directly into others, meaning decisions made without the full picture carry commercial risk. CRU helps clients move beyond fragmented market views by connecting the upstream, midstream and downstream drivers shaping the value chain.



By-products, feedstocks and end-use demand are now structurally linked – disruption in one stage transmits across the whole chain.

Why having a *connected* view matters

Copper smelting creates sulphuric acid – i.e. a strategic asset

The by-product shaping smelter economics and acid market supply

- When copper concentrate supply tightens, smelter acid output falls – tightening acid markets globally.
- Acid pricing has become central to smelter viability, making it a critical revenue and cost signal for the whole copper industry.

Sulphuric acid: The critical input of battery material processing

The reagent, which connects sulphur markets to nickel, cobalt and lithium supply

- HPAL for laterite nickel and cobalt is one of the world's most acid-intensive processes.
- Lithium refining from spodumene also requires significant sulphuric acid.
- When sulphur supply is disrupted, HPAL operations face curtailment risk within weeks – not months.

Sulphur supply is increasingly shaped by geopolitics and battery demand

The upstream feedstock that links oil, gas, metals and the energy transition

- A significant share of global sulphur trade transits a single maritime chokepoint – making it one of the most geopolitically-exposed commodity flows in the world.
- The countries most exposed to supply disruption are also the world's largest battery material processors.
- Fertilizer and metal sectors now compete for the same sulphur supply – creating price dynamics, which affect both industries simultaneously.

Copper is both a driver and a beneficiary of the energy transition

The metal that connects the whole chain – from smelter by-product to battery cells

- The energy transition is increasing demand for copper across EVs, battery cells, charging, grids and renewables – alongside battery materials.
- Clients who track battery materials without following copper are missing the metal, which underpins the whole transition.

How CRU helps you see the *full picture*

CRU's intelligence gives a connected view of copper, sulphur, sulphuric acid and battery materials – with analysts who understand how these markets interlink. Where others see separate markets, CRU helps clients see the full chain. CRU's services support decision-making at each stage of the value chain, working together to give you the complete picture.

See *across the chain* – not just along it

Anticipate input cost risk before it hits your operations

Track sulphur and acid price movements, and understand how they flow through to battery material production costs.

Understand by-product economics across the copper value chain

See how copper smelter decisions affect acid supply – and how acid pricing feeds back into smelter revenue.

Connect upstream disruption to downstream impact

When a conflict, mine closure or policy change occurs, understand immediately which markets are exposed.

Track how battery demand is reshaping upstream markets

Battery storage growth is now one of the fastest-growing drivers of sulphur, acid, nickel, cobalt and lithium demand.

Benchmark assets, costs and procurement with confidence

Asset-level cost, emissions and valuation data across hundreds of copper, nickel and lithium assets globally.

Support investment, strategy and negotiation decisions

From long-term price forecasts and supply gap analysis to contract support and M&A advisory.

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Navigate the market from mining to end-use

Copper can no longer be understood in isolation. Smelter economics, sulphuric acid supply and battery materials demand are now part of the same story.

Track prices and near-term market dynamics

For procurement, contract management and short-term trading decisions

- CRU price assessments: LME, COMEX and Shanghai – independent, methodology-driven, trusted by the industry.
- Market analysis and commentary on geopolitical developments, policy changes and supply-demand shifts.
- Copper concentrates market: TC/RC tracking with weekly prices and forecasting across benchmarks and spot markets.

Plan ahead with five-year and long-term forecasts

For capital allocation, strategic planning and supply security decisions

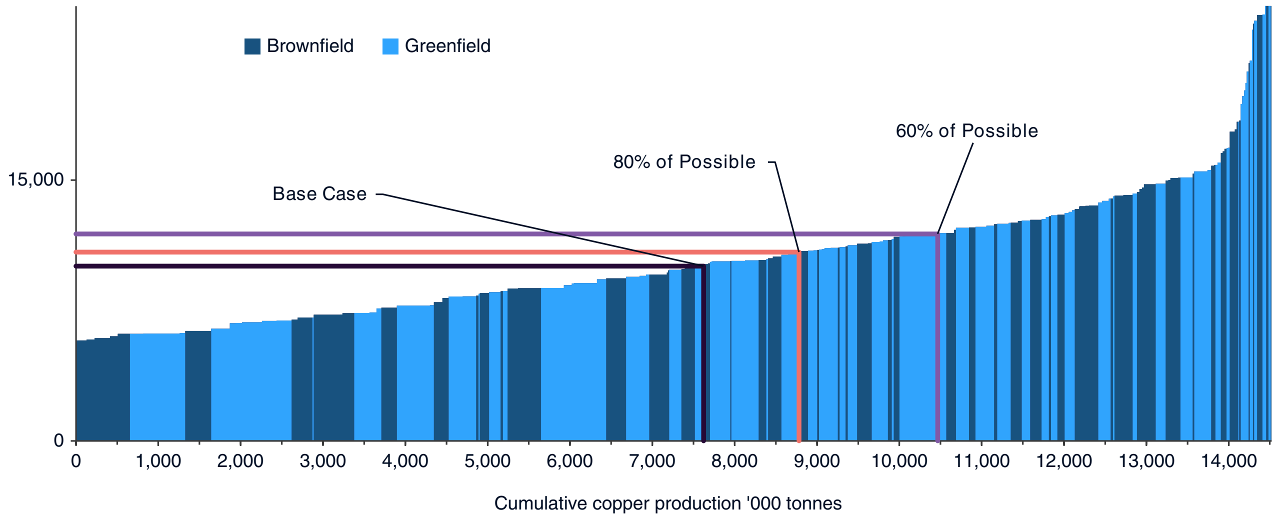
- Five-year pricing and supply-demand forecasts: Refined copper and copper concentrates.
- Ten-year long-term outlook: Demand drivers (EVs, renewables, grid), supply gaps and incentive price scenarios.
- Macro-economic and policy analysis integrated into the forecast framework.

Benchmark assets, costs and emissions at project level

For investment evaluation, M&A support and operational improvement

- Cost, valuation and emissions data for 600+ copper production assets across 45+ countries.
- Scenario modelling: Adjust exchange rates, TC/RC and metal prices to stress-test project economics.
- Scope 1, 2 and 3 emissions data: Supporting CBAM compliance and decarbonisation strategy.

2035 incentive price scenarios, 2025$/t



DATA: CRU. *Please see our feature report published in September 2024 for further analysis.

SULPHUR & SULPHURIC ACID

Track the *feedstock* that connects the chain

Sulphur and sulphuric acid are a key denominator in the critical minerals value chain. They link copper smelting to battery material processing, fertilizer production to metals refining, and geopolitical risk to operational cost.

Understand sulphur supply risk before it reaches your operations

For battery material producers, acid consumers and fertilizer companies

- Global supply-demand balance: 70 Mt+ market, including gas, oil, oil sands and other sources tracked annually.
- Middle East supply analysis: Geopolitical exposure mapped by country and operation.
- Price forecasts: FOB Vancouver, FOB Middle East, CFR China, CFR Brazil, CFR India, FOB Tampa (molten).

Track acid market tightness and price risk across regions and sectors

For copper producers, battery material processors, fertilizer companies and acid traders

- Price assessments and forecasts across all major trade routes: CFR Chile, CFR India, CFR Brazil, FOB China, FOB NW Europe, FOB Japan/South Korea.
- Smelter economics: How acid pricing feeds back into copper smelter revenue and viability.
- Regional market outlooks: Chile, Peru, Morocco, India, Indonesia, Saudi Arabia, DRC, Namibia, Brazil, USA, Europe.

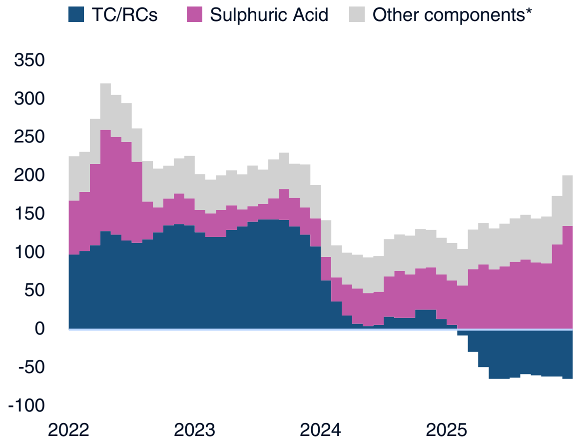
See how acid demand is being reshaped by the energy transition

For understanding who is driving acid demand now – and how that is changing

- Demand by end-use: Phosphoric acid, copper, nickel, lithium, uranium, titanium dioxide, manganese, industrial.
- Battery metals are now the fastest-growing acid demand sector – and their share is rising.
- Sulphur-burner economics: When does it make more sense to buy acid than burn sulphur? CRU tracks the crossover.

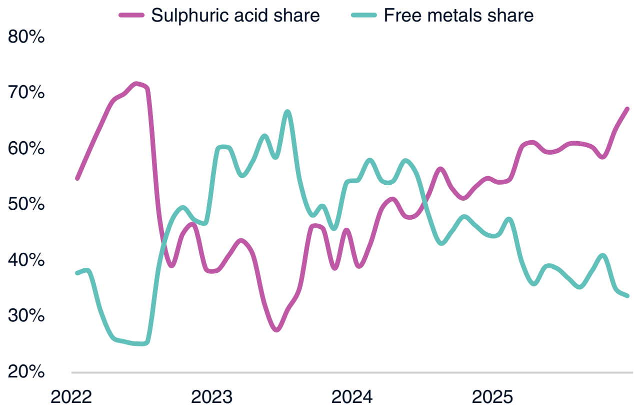
Smelter's revenue at a historical low level

China's smelter revenue structure, USD/ dmt of concentrate processed



Acid share over 64% of smelter revenue

China's smelter revenue of sulphuric acid and free metals, excl. TC/RCs, % dmt of concentrate processed



DATA: CRU Copper Concentrate service, * includes revenues from free metal and cathode premium

BATTERY MATERIALS

From raw materials to *cells*

Battery material markets are growing fast, becoming more complex and are increasingly interconnected with upstream commodity markets. CRU's coverage enables clients to navigate demand growth, supply risk, technology change and policy disruption – across the full value chain.

See how battery demand is reshaping the entire critical minerals value chain

End-to-end battery market intelligence – from raw materials to cell

- EV and BESS demand forecasts by region, powertrain type and application – with policy scenario analysis.
- Battery chemistry roadmaps: LFP, NMC, NCA, LMFP, Na-ion – market share by region and application.
- Raw materials: Lithium, nickel, cobalt, manganese – supply-demand balance, price forecasts, risk scenarios

Understand cell costs, technology trajectories and what drives them

For cell makers, OEMs, investors and procurement teams managing battery cost exposure

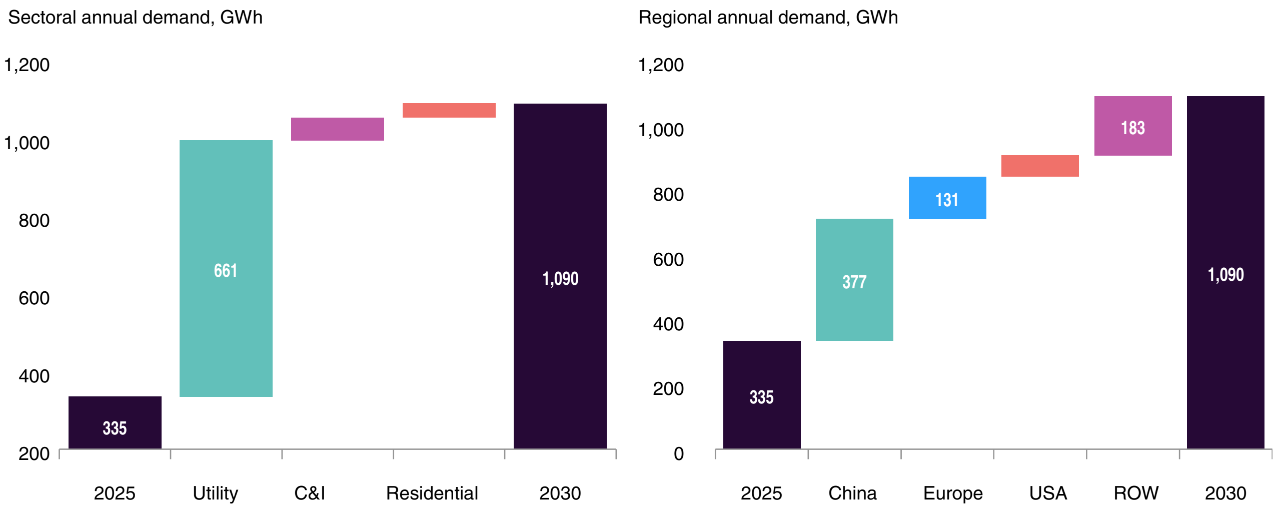
- Bottom-up cell cost modelling: LFP, NMC, NCA, LMFP, Na-ion, semi-solid and all-solid-state.
- Technology roadmap: LFP fourth generation, LMFP, sodium-ion, semi-solid and all-solid-state timelines.
- Gigafactory analysis: Leading cell makers – margins, R&D spend, capacity utilisation.

Track lithium, nickel and cobalt markets shaped by policy, supply risk and sulphur constraint

For battery material producers, traders and investors exposed to intermediates market dynamics

- Lithium: Supply-demand balance, price forecasts, supply risk analysis and asset-level cost curves.
- Nickel: RKAB quota analysis, HPAL cost modelling, cobalt by-product credits and CBAM analysis.
- Cobalt: DRC export quota system, shipment delays, stock dynamics and demand by end-use.

Chinese utility energy storage will see the bulk of battery installations due to supportive policy



DATA: CRU Energy Storage Service

Why CRU's *approach* is different

CRU has been providing independent commodity intelligence for over 50 years. What makes us different is not just the depth of our individual commodity coverage, but also the breadth of our connected view across value chains.

Real analysts. Real insight.

Our analysts are specialists; embedded in their markets, based in the regions they cover and connected across commodities. Combined and coherent market perspective is what makes CRU intelligence genuinely actionable.

290+
experts globally

17
offices worldwide

300+
years combined cross-commodity expertise

50+
years of market analysis

6
continents covered

Global Perspective
Analysts positioned across key commodity markets worldwide

Local Expertise
On-the-ground knowledge in the markets that matter most

Unmatched Insight
Deep proprietary data across prices, forecasts and assets

Stronger Together
Connected specialist teams working across commodities, not in silos

Specialist teams across the *connected chain*

Each commodity is covered by a dedicated specialist team. What sets us apart is that these teams work together, sharing insights across copper, sulphur, acid and battery materials to give clients the connected view that no single-commodity provider can offer.

COPPER

16 dedicated analysts across five continents – covering mine-to-market dynamics, concentrates, smelting, refining, assets and end-use demand.

200+ years combined expertise

SULPHUR & SULPHURIC ACID

Five specialist teams covering the global sulphur and sulphuric acid markets – supply, trade, pricing and demand across fertilizers, metals and battery materials.

35+ years of combined expertise

BATTERY MATERIALS

A global, multidisciplinary team of 20 analysts and battery scientists – covering raw materials, active materials, cell technology, EVs and energy storage.

100+ years combined expertise

We are *at the centre* of industry discussion

CRU analysts are not just behind the data – they are active participants in the global commodity conversation, presenting at the industry's most important events.

CRU World Copper Conference

Brings together the global copper value chain during CESCO Week, with discussions shaped by the key issues driving the copper market.

CRU Sulphur & Sulphuric Acid Conference

Annual gathering of the global sulphur and sulphuric acid community, covering supply risk, trade flows, smelter economics and battery metals demand growth.

CRU World Lithium Conference

Co-located with the copper conference – reflecting the structural connection between copper, lithium and the energy transition.

Bespoke advisory and consulting

Beyond our subscription services, CRU's consulting team provides tailored support for strategic decisions:

- **Strategic planning:** Acquisitions, growth strategy, emissions and procurement.
- **Valuation:** Feasibility studies, M&A support and specialised business element valuation.
- **Market decisions:** Specialised market studies, lenders' market reports.
- **Negotiation support:** Contract reviews, negotiation assistance and risk assessment.
- **Policy analysis and advocacy:** Independent market assessment and industry impact analysis.

Ready to see the full picture?
Request a *demo*

Analysts on the ground where it matters

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