



Cobalt Market Report

Prepared by Benchmark Mineral Intelligence
for The Cobalt Institute

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Cobalt Congress, New York
13th May 2024

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Price Assessments & Market Data

Lithium (16 Prices)
Cobalt (6 Prices)
Natural Graphite (12 Prices)
Synthetic Graphite (8 Prices)
Nickel (8 Prices)
Anode and Cathode prices (6 Anode, 7 Cathode)

Lithium Ion Battery (50 Prices)
Black Mass (21 Prices)
Gigafactory Assessment
Precursor Assessment
Sodium Ion Batteries
Rare Earths

WEEKLY/
MONTHLY

Forecasting, Consultancy & Sustainability

Lithium
Cobalt
Nickel
Natural & Synthetic Graphite
Anode & Cathode
Lithium Ion Battery Database
Solid State & Lithium Metal Batteries
Recycling

Manganese Sulphate
Phosphoric Acid
Rare Earths
Fluorspar
ESG Analysis
Battery Emissions Analyser
Life Cycle Assessments

QUARTERLY

News, Analysis, Webinars & Events

News Analysis
Benchmark Source
Supply Chain Commentary
Presentation Archive

Quarterly Industry Reports
Weekly Price Spotlight
Quarterly Review Magazine
Special Issue Reports

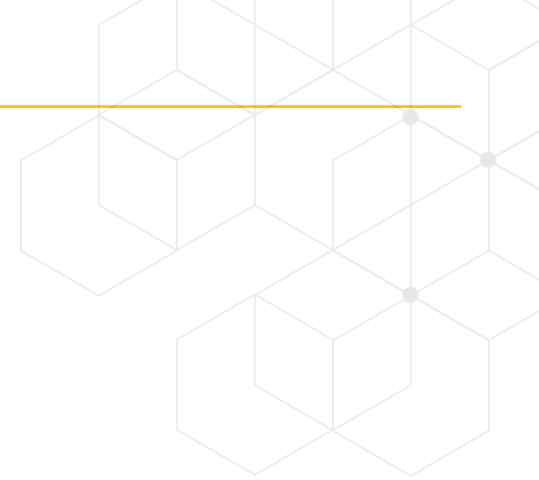
In-person events in all regions
Analyst Insights
Video Archive

REGULAR

Outline

- **From Istanbul to New York...**

- Demand: Strong annual growth continues
- Supply: DRC and Indonesia lift output above 200 kt
- Oversupplied market weighing on prices
- Key considerations for cobalt's outlook



From Istanbul to New York...



Short term fundamentals weakened considerably



But mid to long term demand outlook remains strong

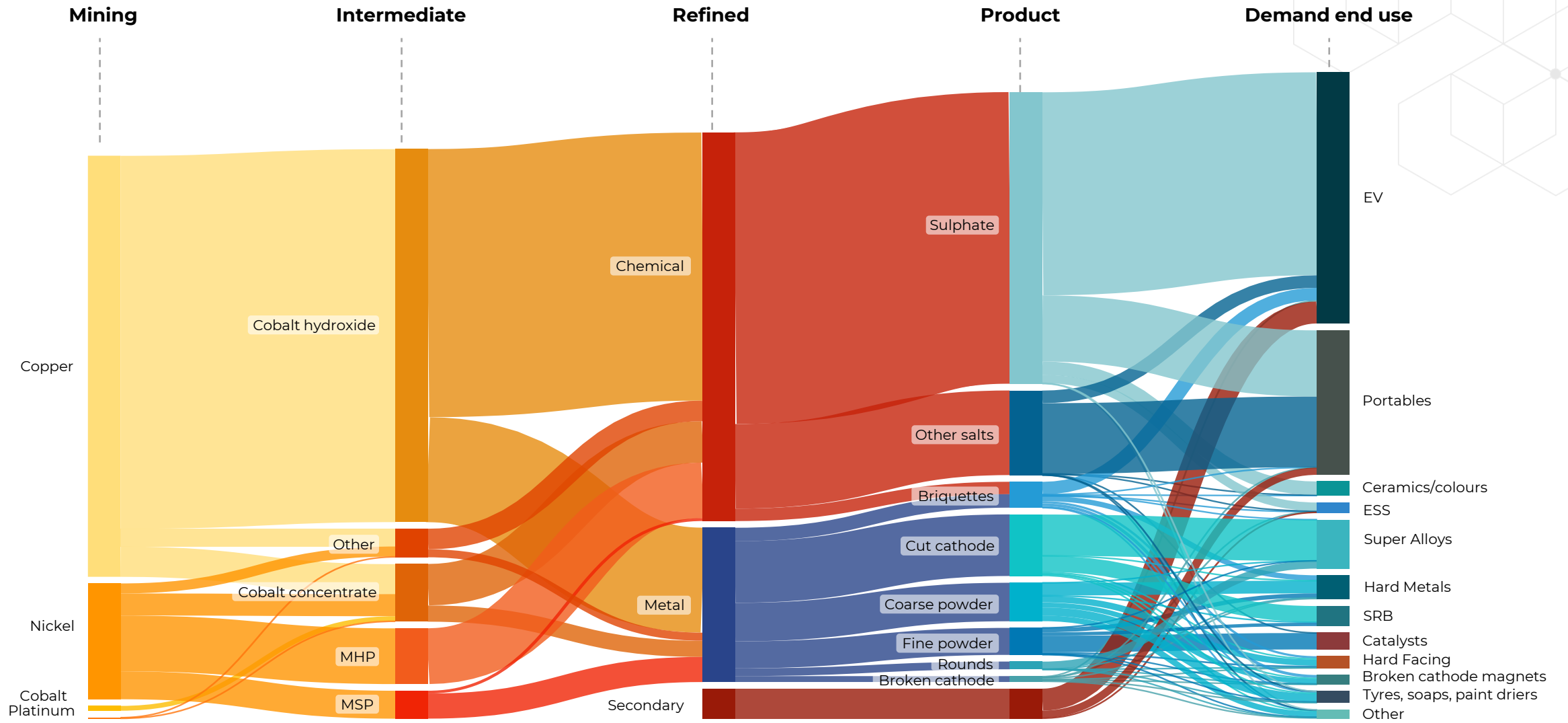


Prices will recover to incentivise new supply investment



New policy announcements will re-shape supply chains



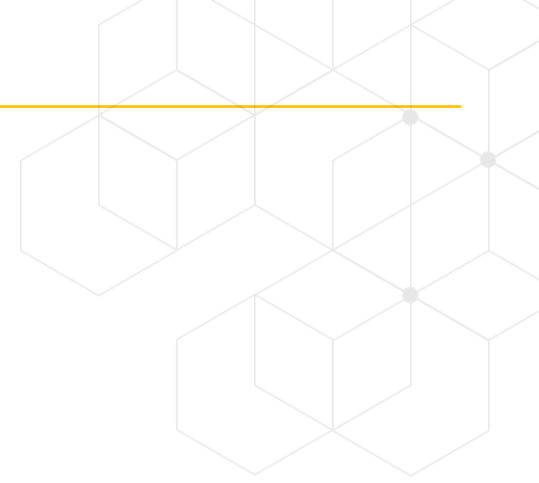


Outline

- From Istanbul to New York...

- **Demand: Strong annual growth continues**

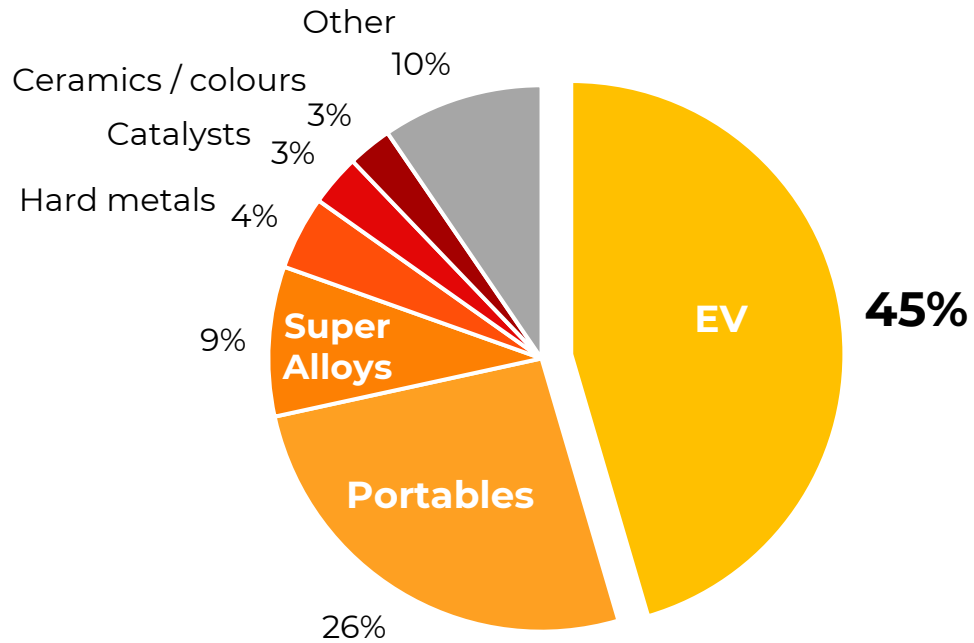
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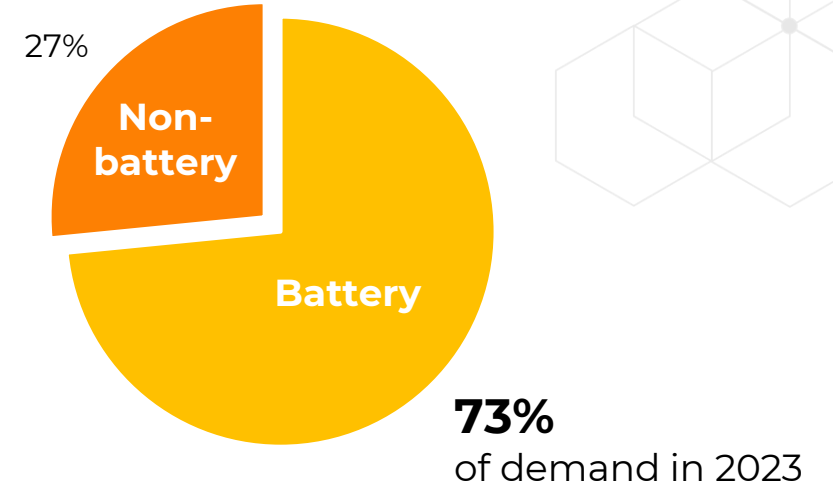
EV market continues to drive cobalt forwards

Demand by sector in 2023

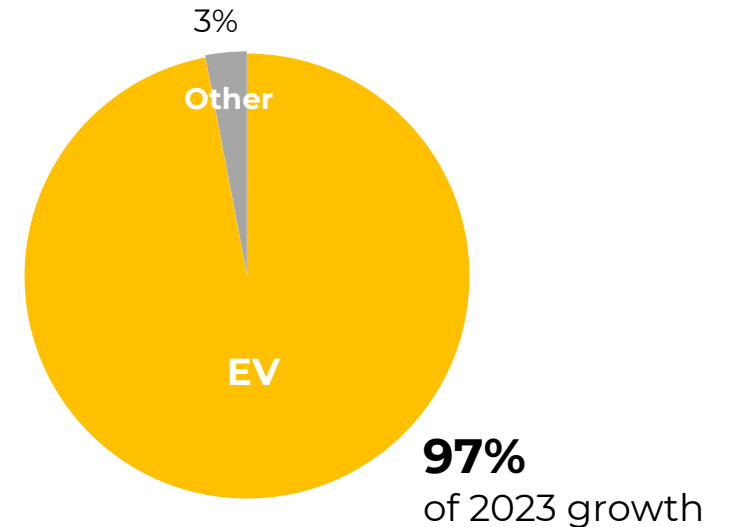
%



Battery share continues to rise



EVs the dominant growth driver



EV market weakness vs. slowing growth?



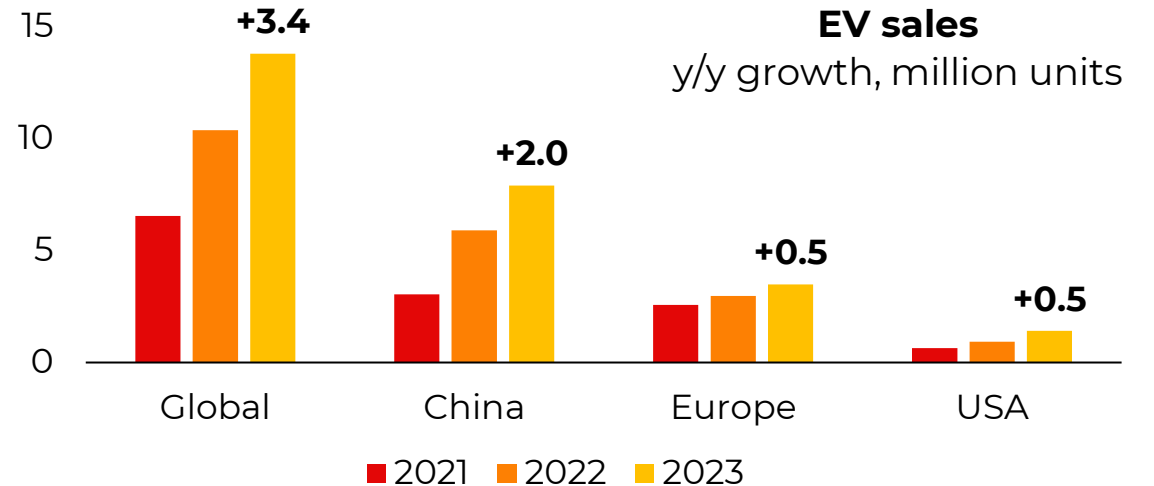
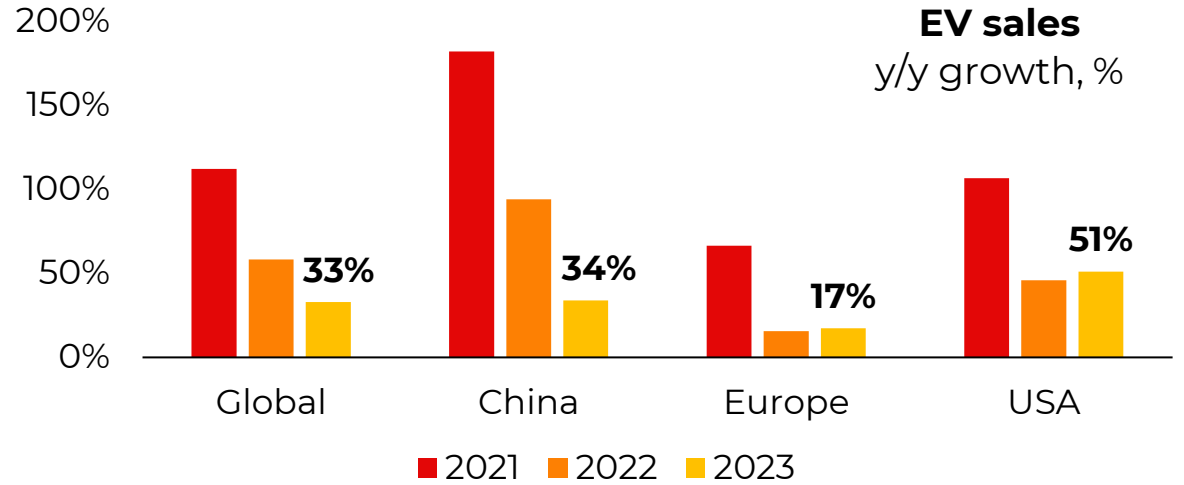
Macroeconomic headwinds



Growth rates unsustainable



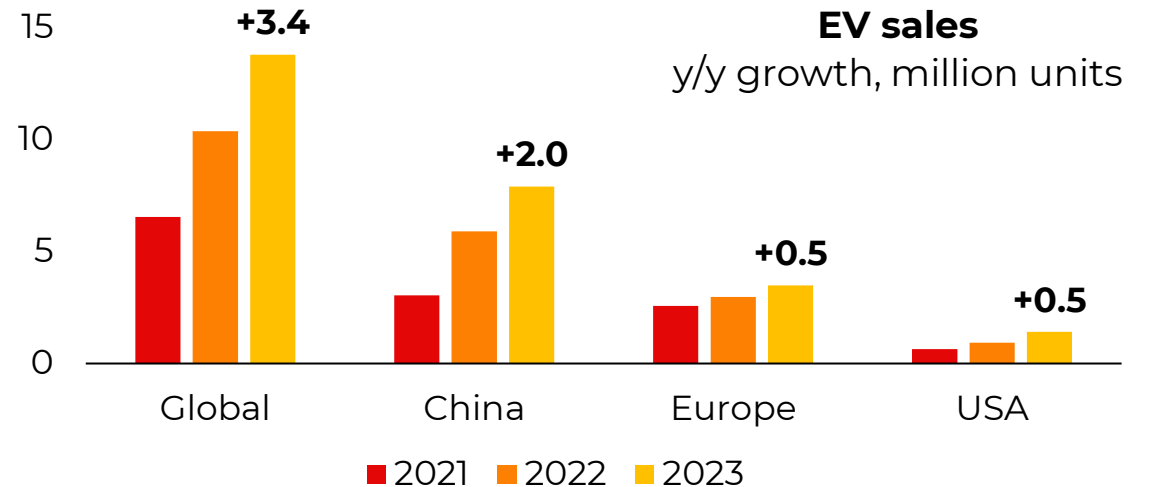
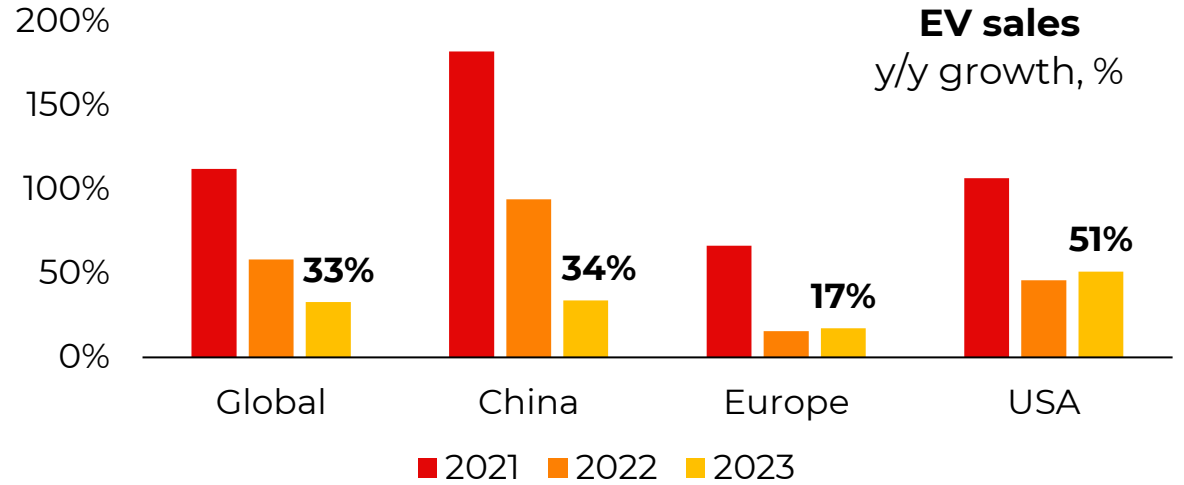
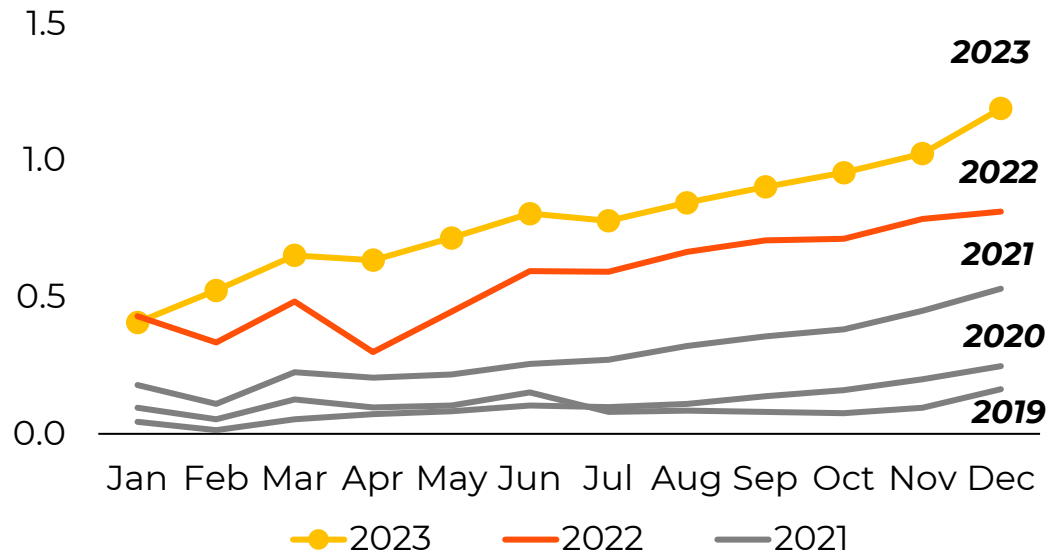
EV price cuts ≠ weak sales



EV market weakness vs. slowing growth?

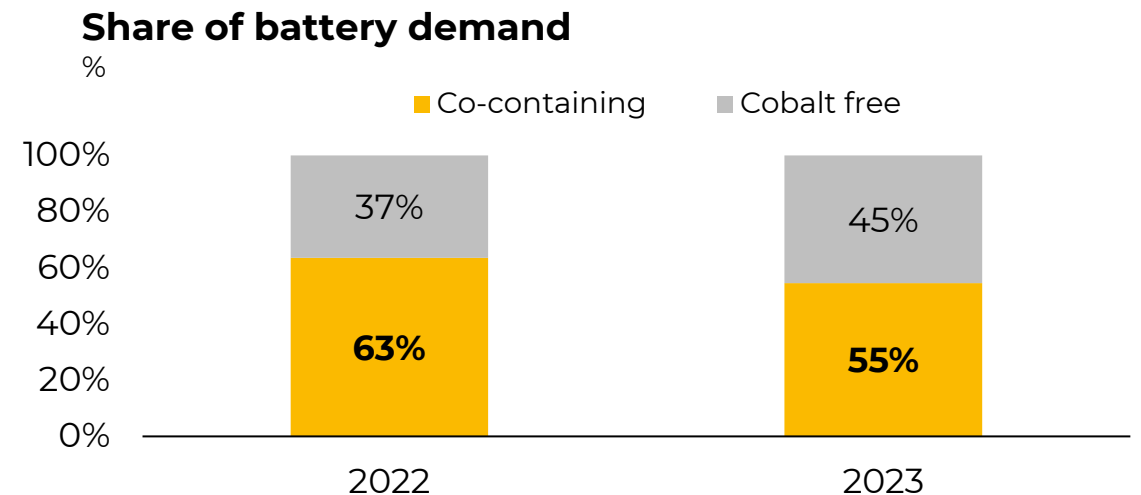
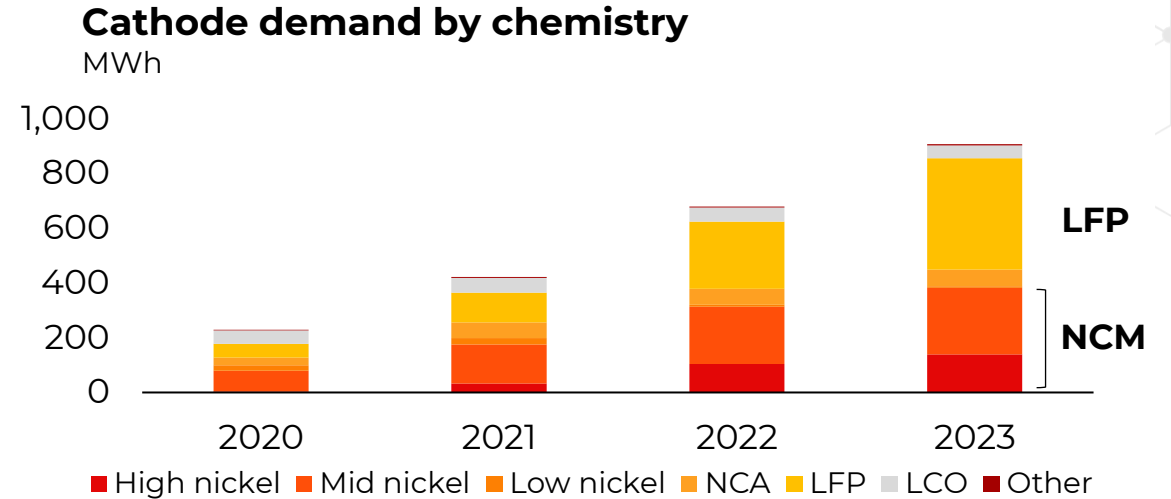
Monthly NEV sales in China

million units



Chemistry choices are key for cobalt – 5 key takeaways

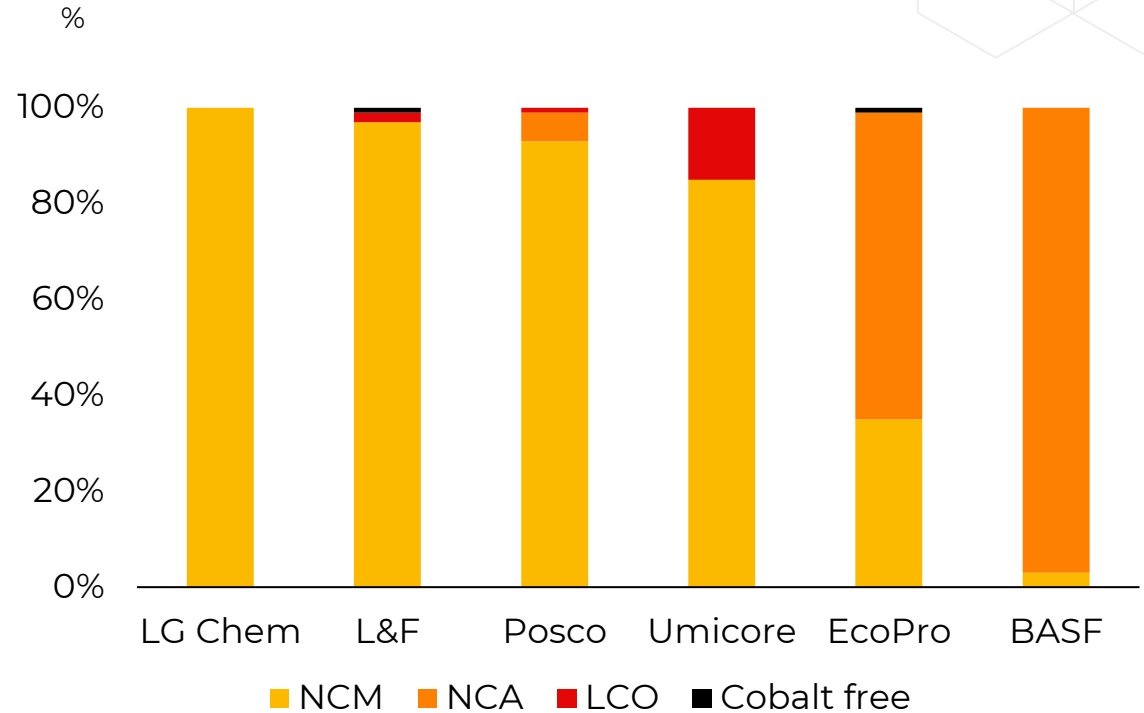
- 1 **Cobalt remains a key component**
- 2 **Particularly important outside of China**
- 3 **LFP still a China story**
- 4 **Competitiveness markedly improved**
- 5 **Further performance potential for NCM**



Chemistry choices are key for cobalt – 5 key takeaways

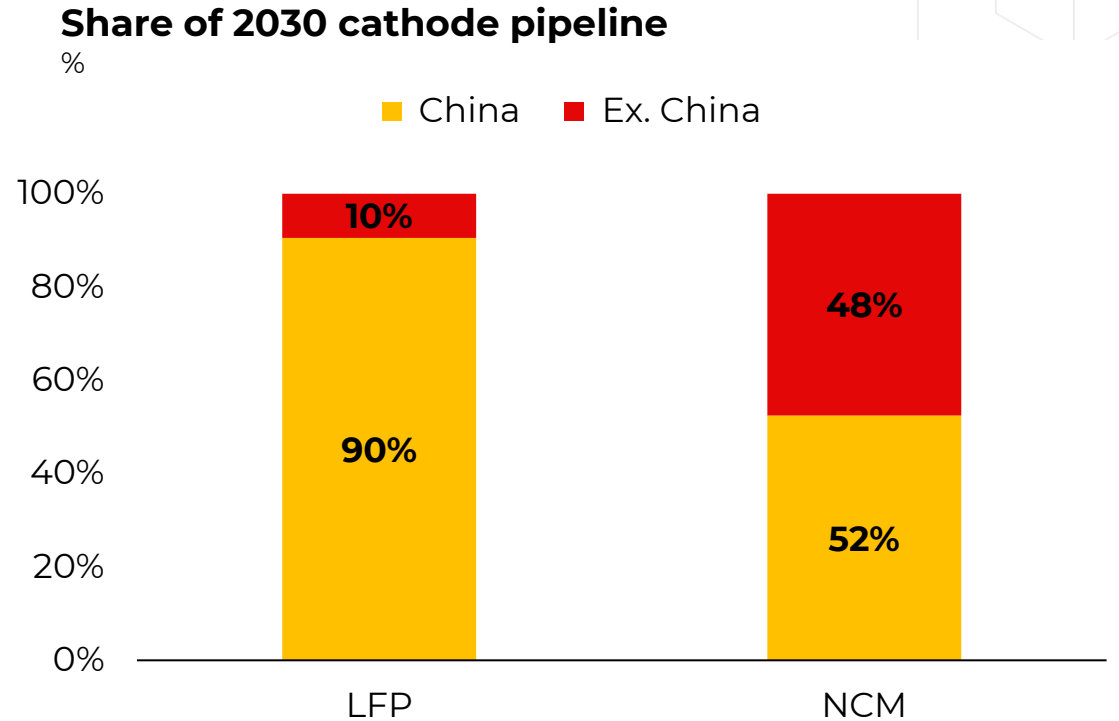
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2023 cathode product mix – major ex. China suppliers



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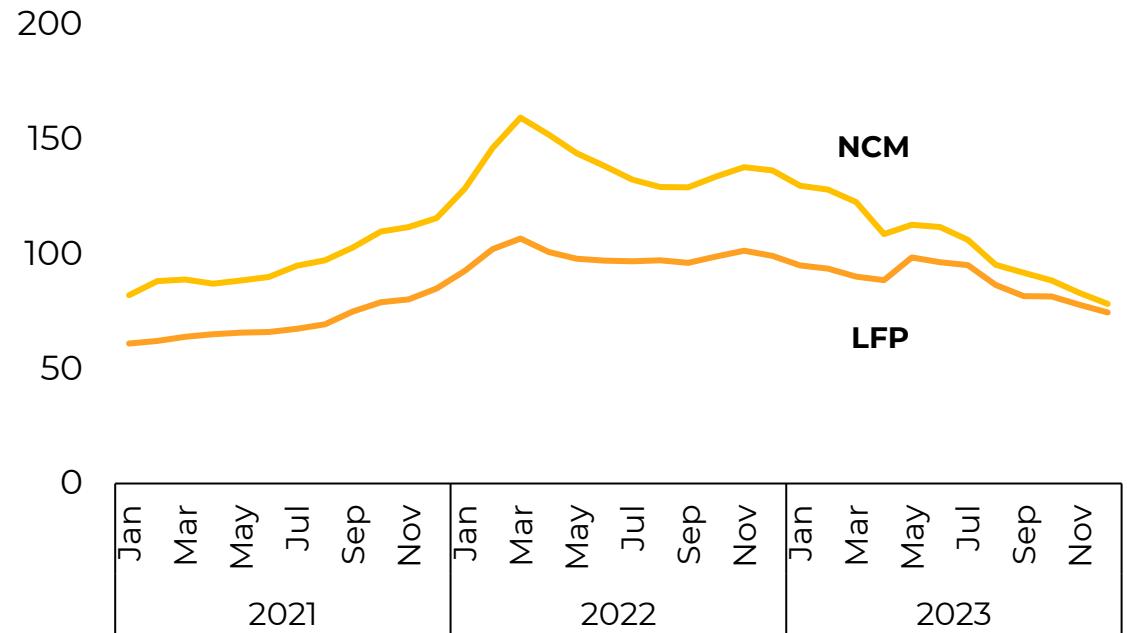


Chemistry choices are key for cobalt – 5 key takeaways



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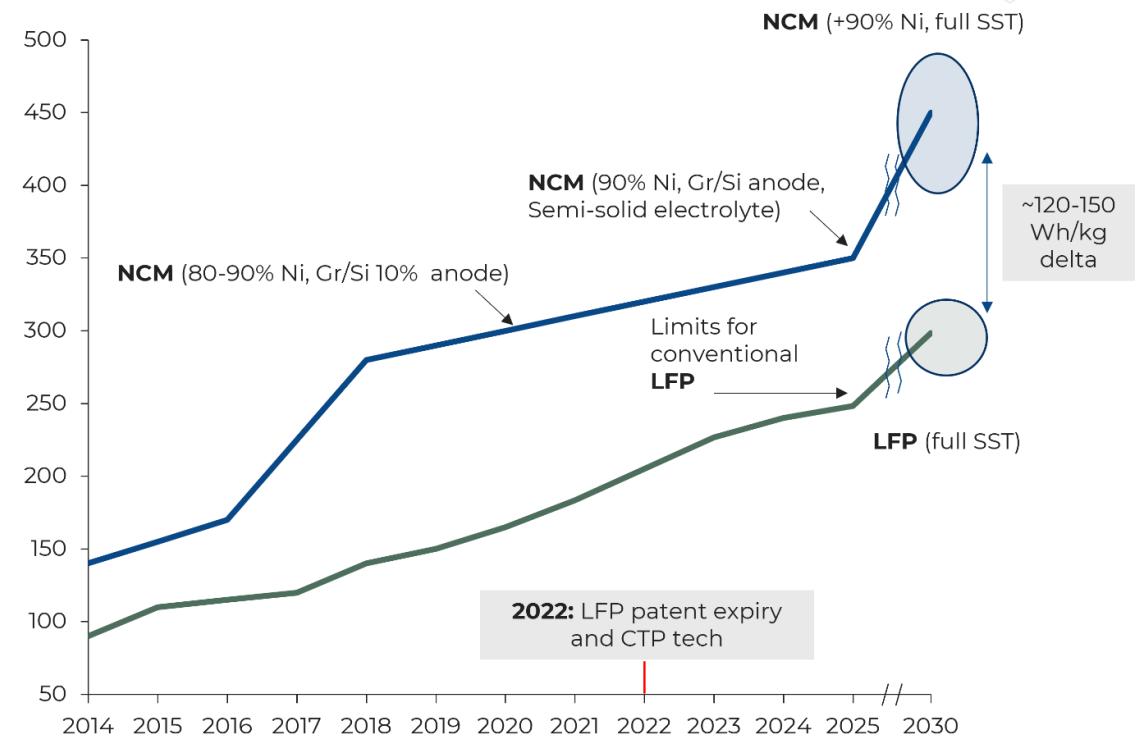
Weighted average global cell prices
\$/kWh



Chemistry choices are key for cobalt – 5 key takeaways

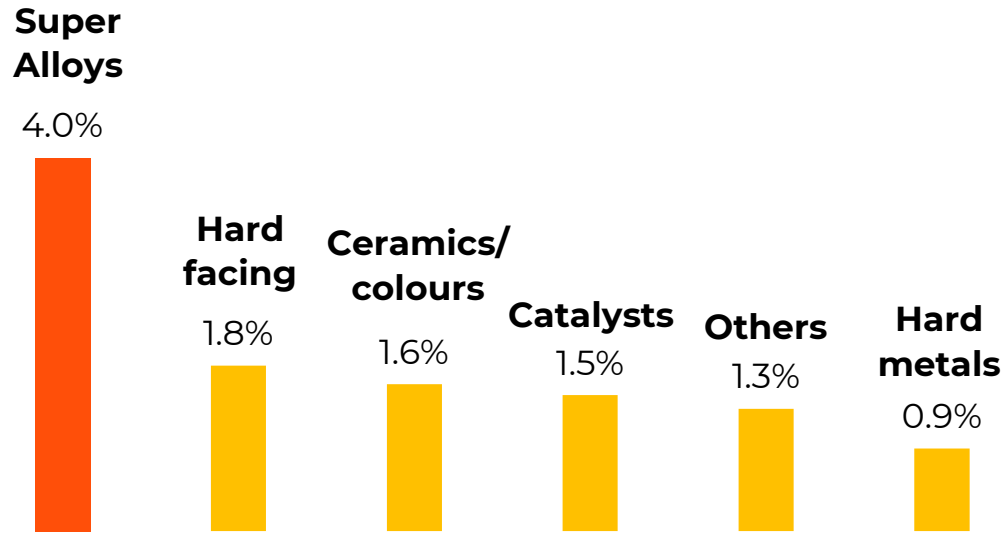
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- 5 **Further performance potential for NCM**

Development of NCM and LFP energy density Wh/kg

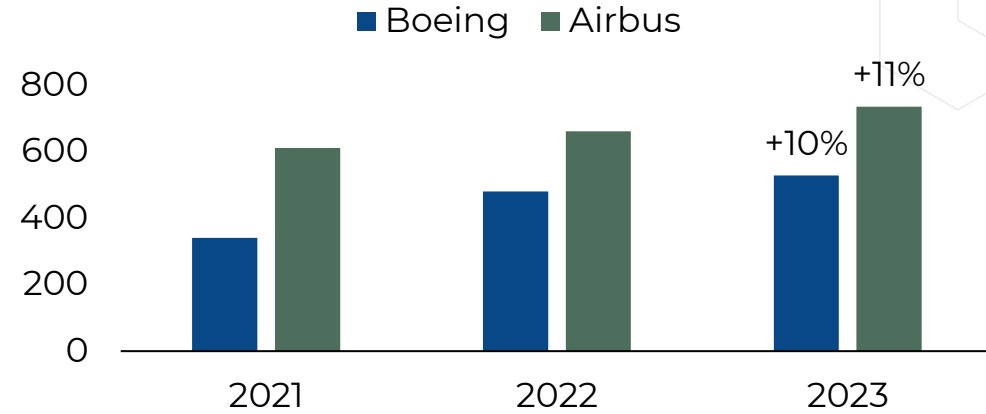


Super alloys demand supported by commercial and military sectors

2023 demand growth: non-battery markets % y/y



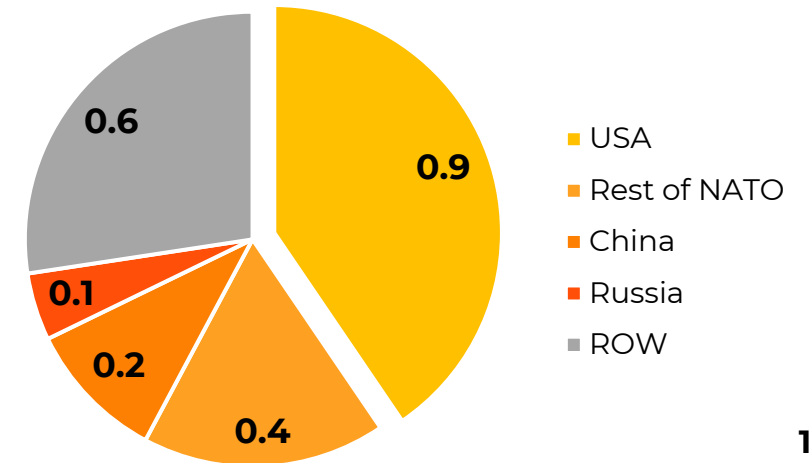
Commercial aircraft deliveries units



Military spending in 2023 by country Trillion \$

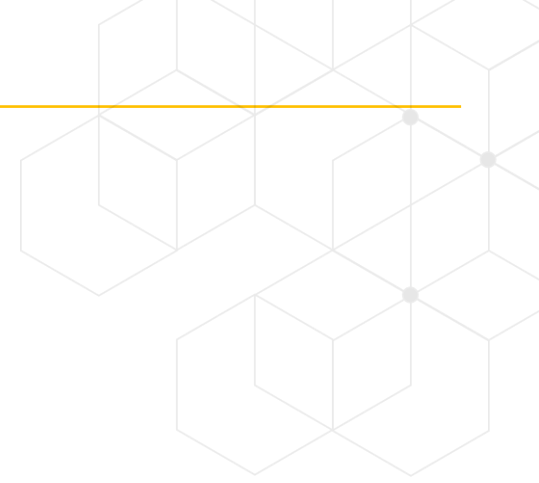
Global: \$2.2 trillion in 2023

+9% vs 2022



Outline

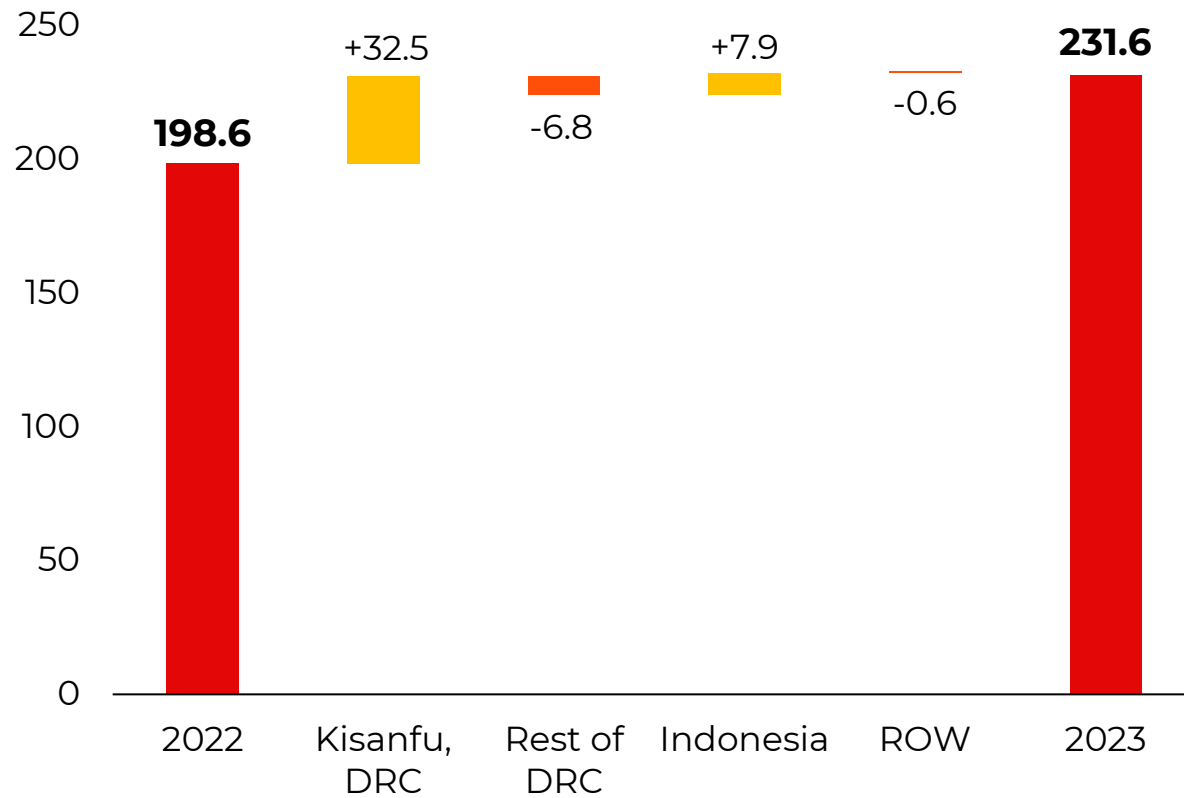
- From Istanbul to New York...
- Demand: Strong annual growth continues
- **Supply: DRC and Indonesia lift output above 200 kt**
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DRC and Indonesia driving output higher

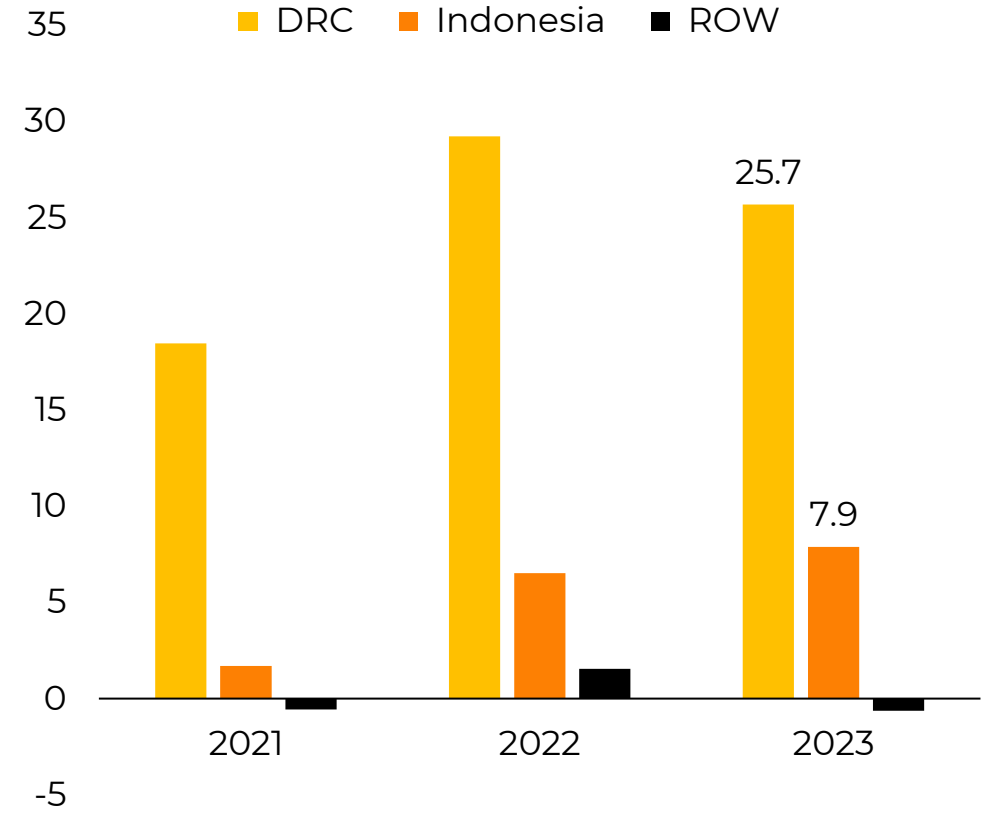
Changes to mined cobalt supply in 2023

kt cobalt



y/y change in mined supply

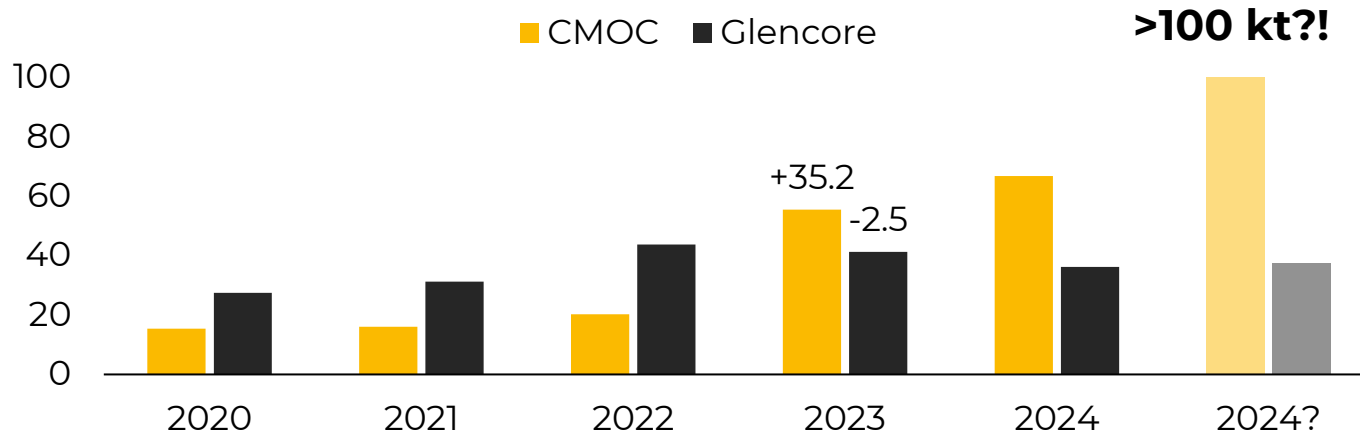
kt cobalt



CMOC cementing leading position with a quarter of global supply

Mined cobalt production

kt cobalt



Q1 2024 production

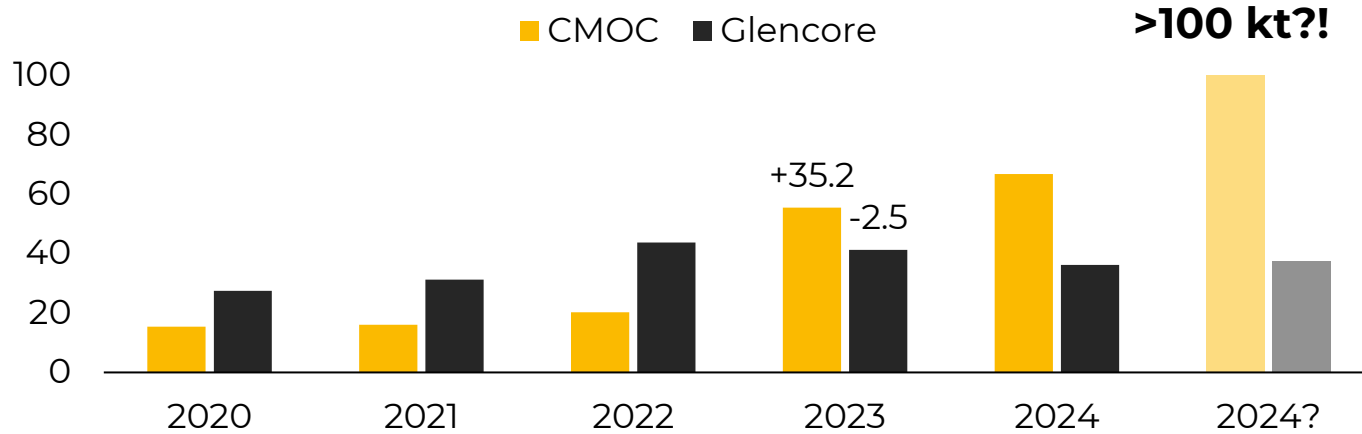
y/y change vs Q1 2023, %



CMOC cementing leading position with a quarter of global supply

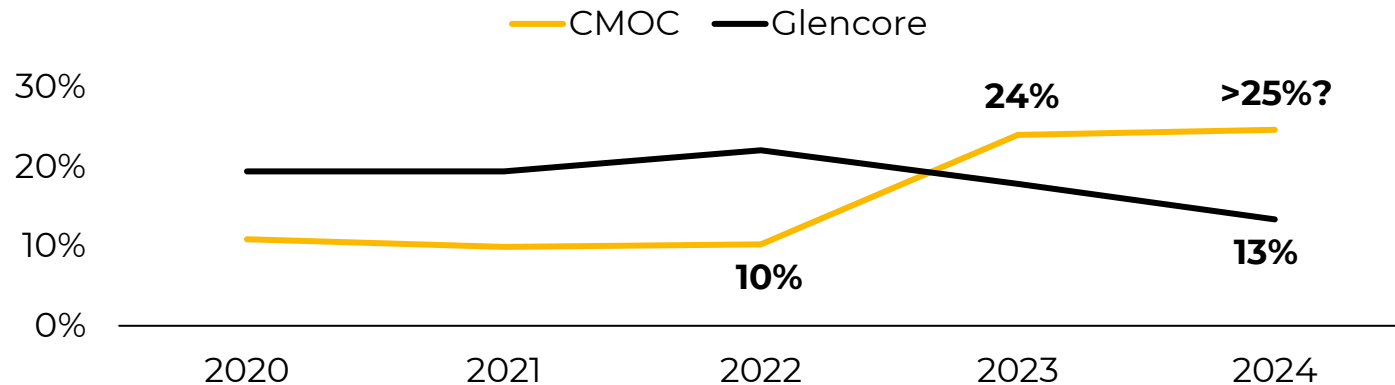
Mined cobalt production

kt cobalt



Global market share

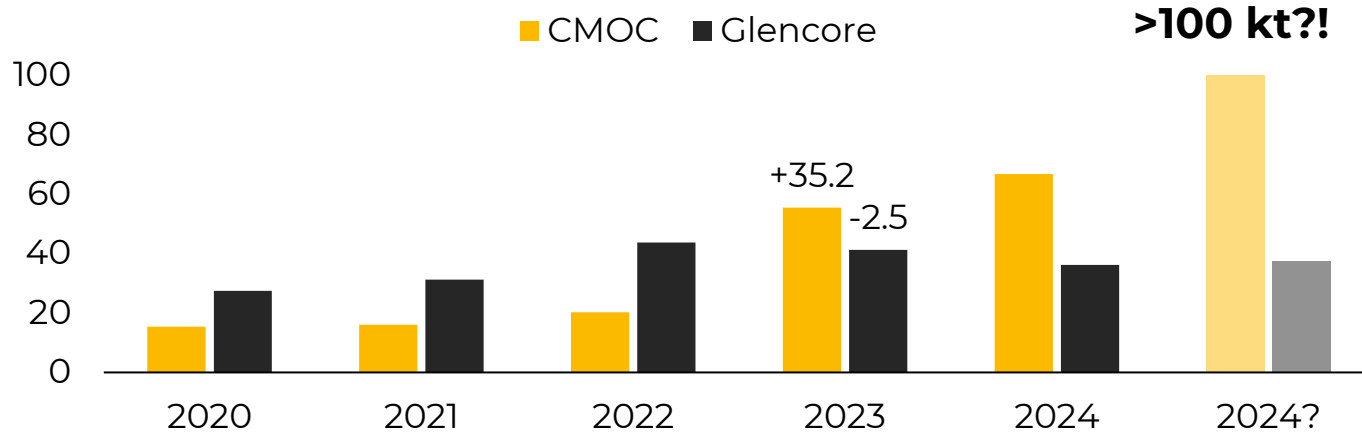
% mined supply



CMOC cementing leading position with a quarter of global supply

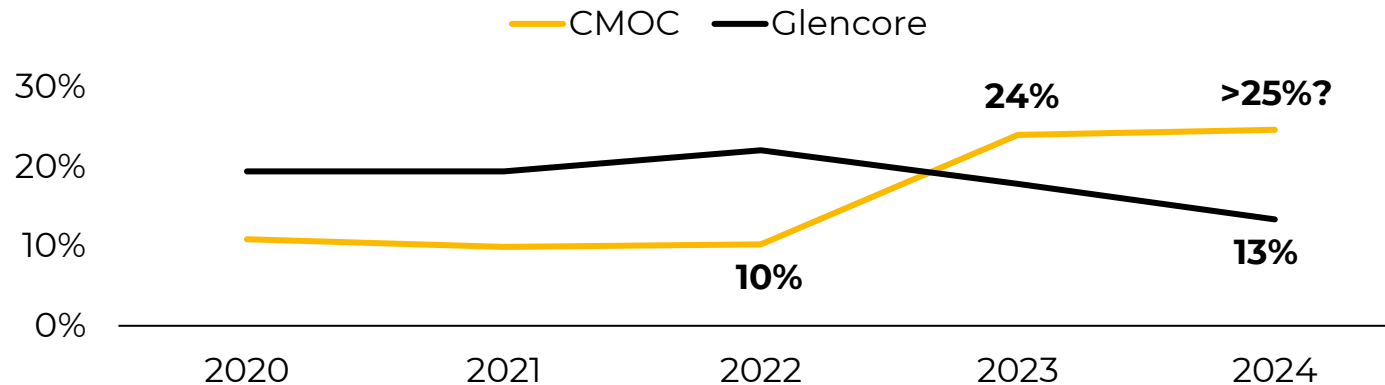
Mined cobalt production

kt cobalt



Global market share

% mined supply



Kisanfu & Tenke

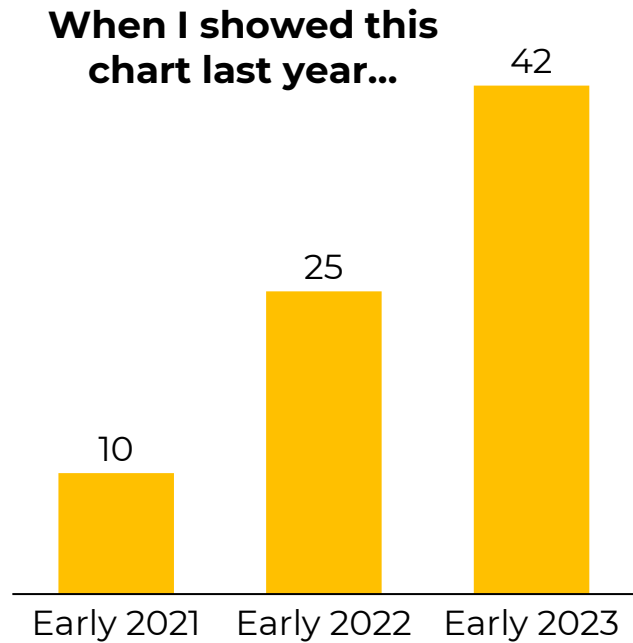
Strategic copper

Copper rally

Supply response?

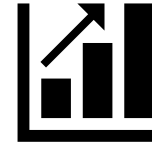
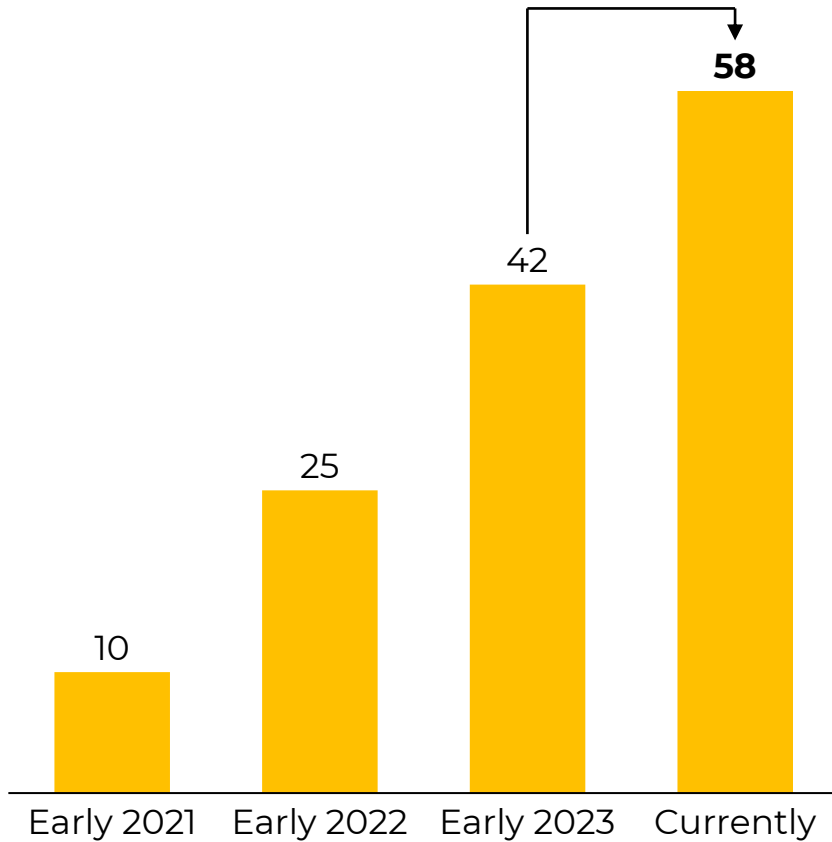
Indonesia's pipeline builds further

Number of Indonesian Ni-Co projects tracked by Benchmark



Risks remain for Indonesia's development

Number of Indonesian Ni-Co projects tracked by Benchmark



Project development



OEM acceptance



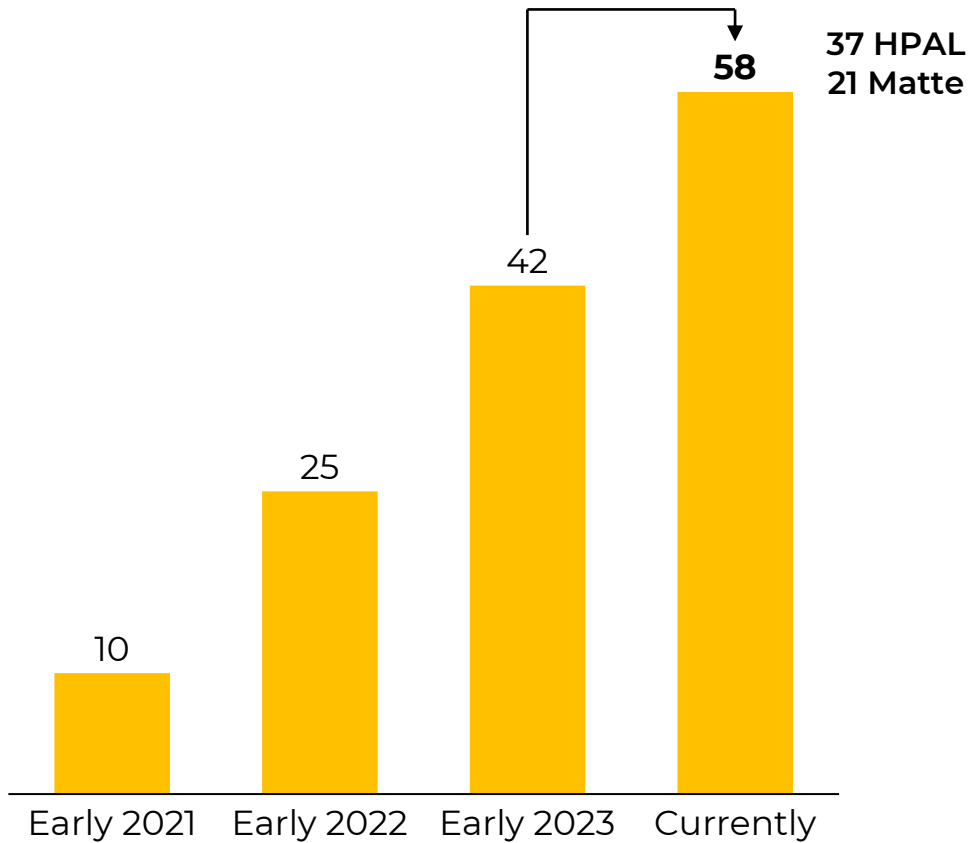
Policy position (particularly IRA)



Sustainability concerns

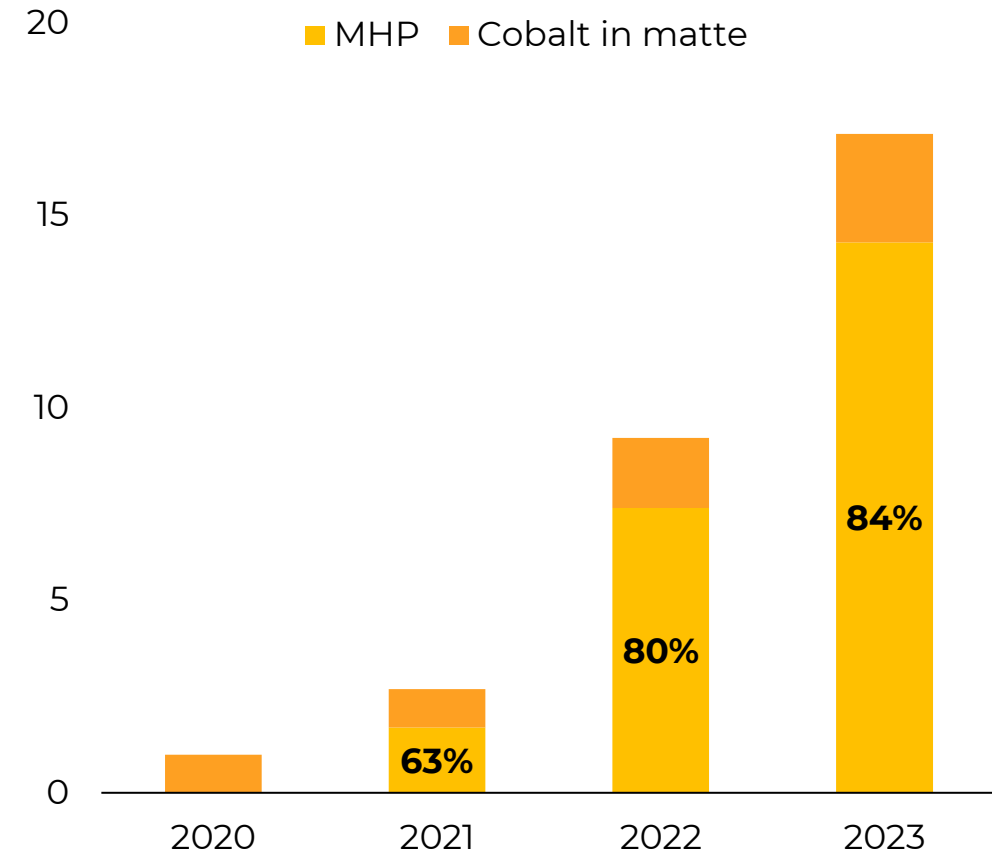
HPAL route is key for the cobalt and nickel markets

Number of Indonesian Ni-Co projects tracked by Benchmark



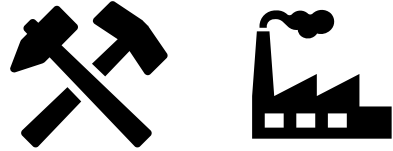
Share of Indonesia's production by intermediate

kt cobalt



Major players setting sights on full Indonesian EV value chain

MINING & REFINING



CELL



EVs



EV SALES



OPERATING

CATL



Starting in 2024



LG Energy Solution



HYUNDAI

Starting in 2024



HYUNDAI



PLANNING

LG Energy Solution



BASF



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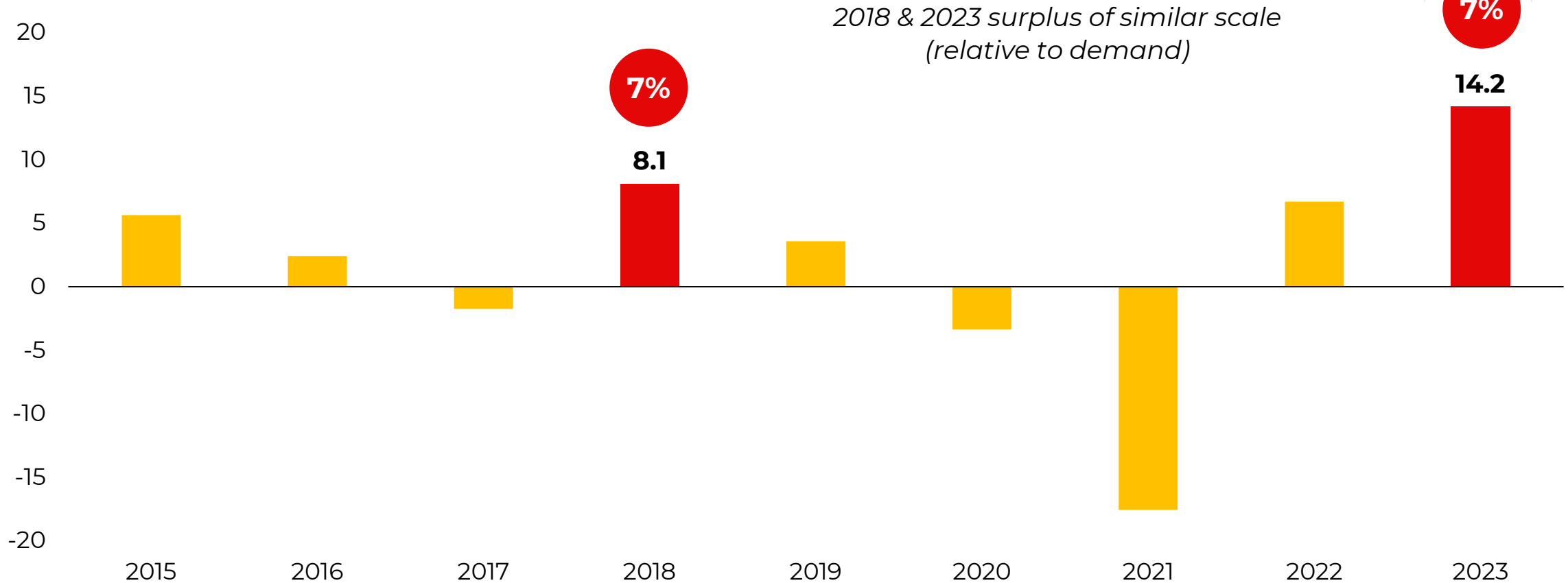
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Largest volume market surplus in 2023...but equivalent to 2018

Cobalt market balance

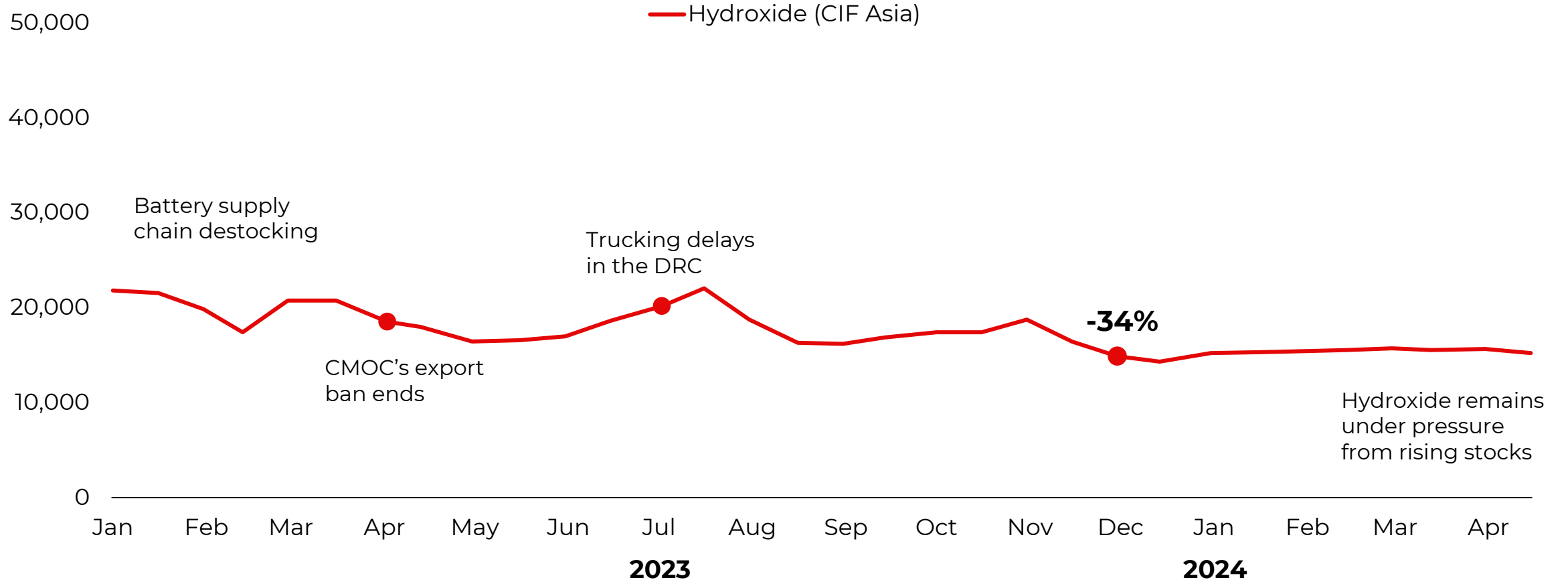
kt cobalt



Hydroxide the worst performer in 2023

Cobalt prices

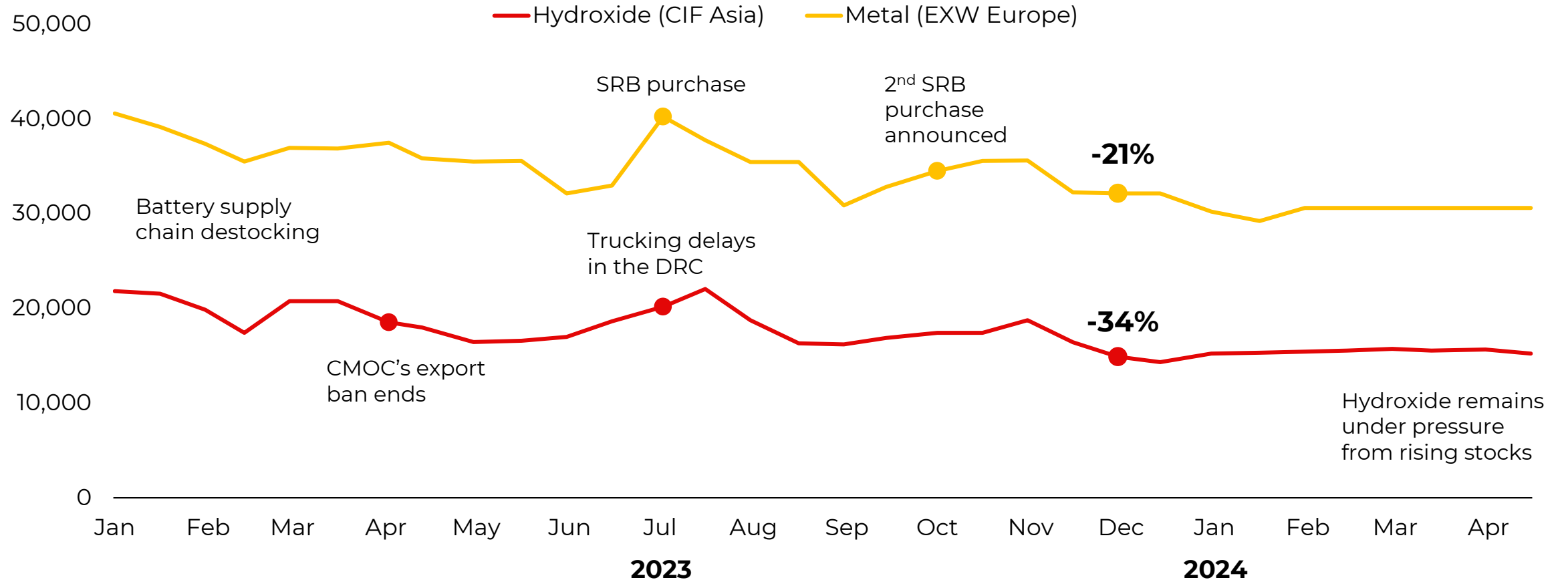
\$/tonne (cobalt contained)



Metal prices had some support from SRB purchasing

Cobalt prices

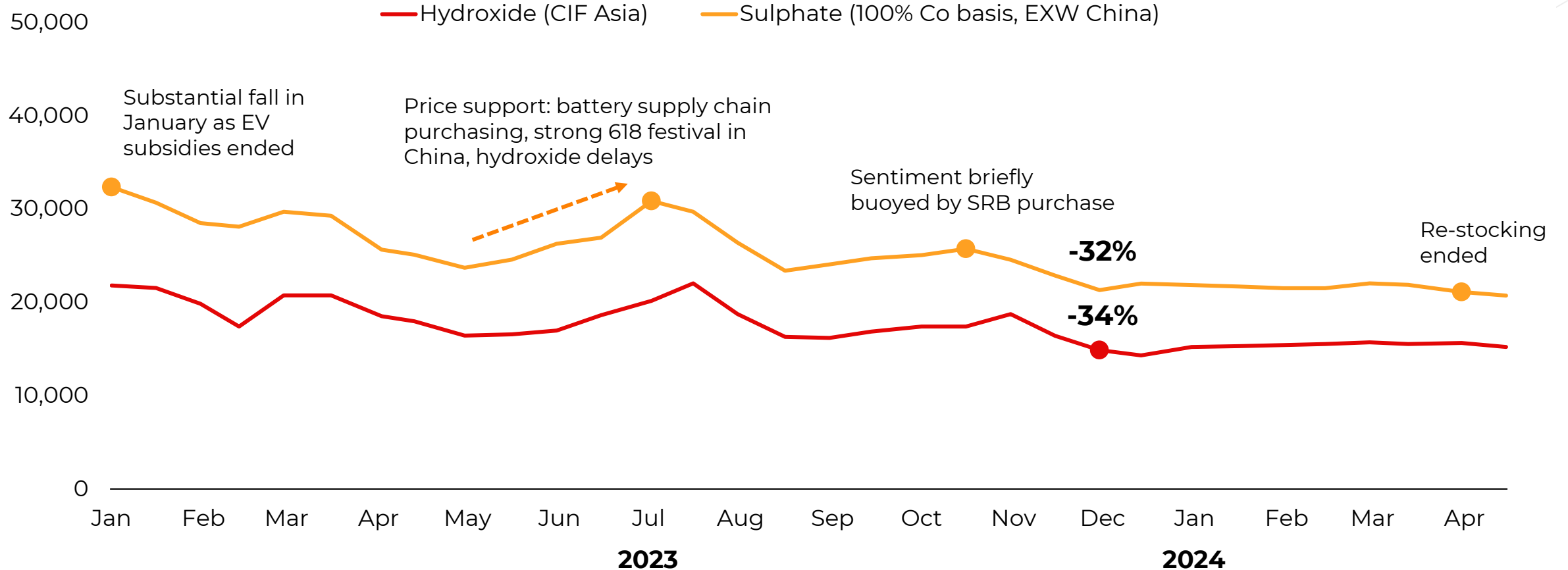
\$/tonne (cobalt contained)



Sulphate prices now at a 7-year low

Cobalt prices

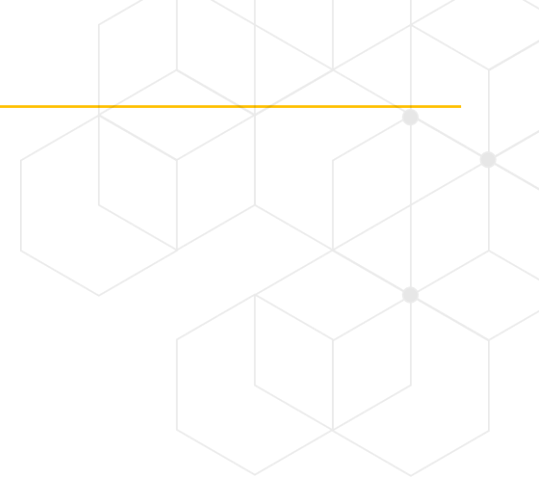
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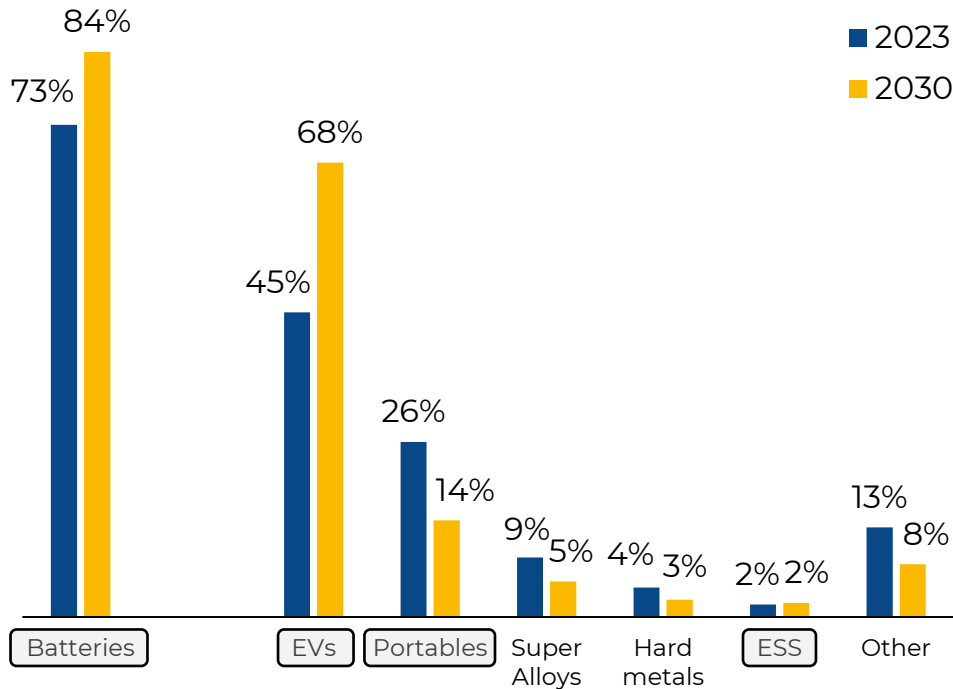
• **Key considerations for cobalt's outlook**



Key considerations for cobalt's outlook

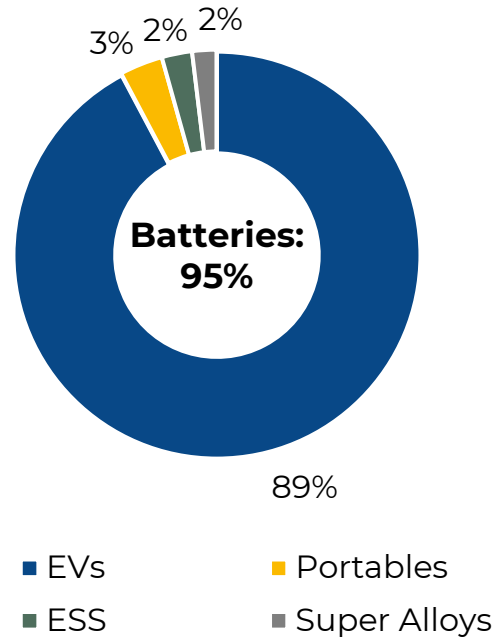
Cobalt remains important for the rapidly growing battery market

Share of cobalt demand, 2023 vs. 2030



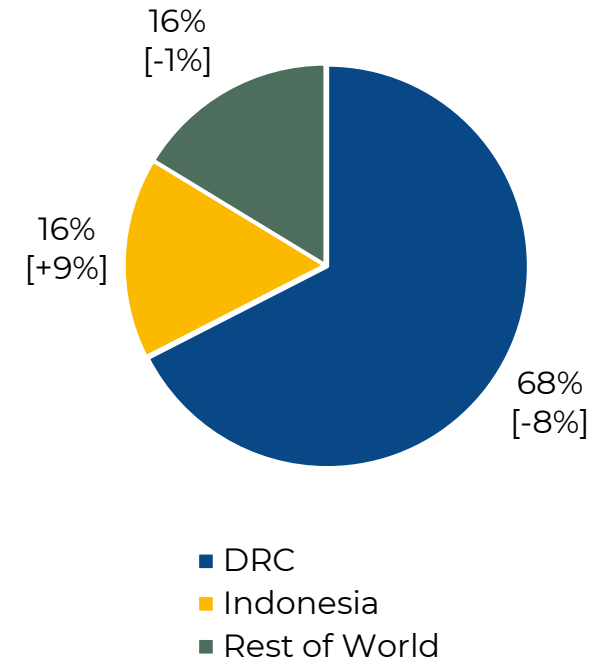
Batteries will support market doubling in size

Share of demand growth to 2030



Supply growth dominated by DRC (48%) & Indonesia (37%)

Supply share in 2030 [change vs. 2023]



Critical Mineral Supply Chains are at the Heart of Geopolitics

- Critical Raw Materials Act (CRMA)
- Minerals Security Partnership (MSP) Forum
- Strategic partnerships e.g. Canada & the DRC

- Leading position in many supply chains
- IRA's FEOC definitions
- Deep sea mining



- Inflation Reduction Act (IRA)
- Minerals Security Partnership (MSP) Forum
- Lobito Corridor
- Considered alongside national security

- President Tshisekedi wins 2nd term
- Focus on downstream development & value addition
- Foreign investment diversification

- Entered critical minerals space
- MoU with the DRC
- Diversify fossil-fuel economies

- New leadership – Prabowo Subianto
- Expected to continue Jokowi's "commodity downstreaming" policy
- "Non-alignment" – co-operation with US and China

Although elections may shift the landscape

Cobalt's position in the North American battery value chain

Mining

Canada

- 1: Raglan, Glencore
- 2: Voisey's Bay, Vale
- 3: Sudbury, Vale & Glencore
- 4: Nico, Fortune Minerals
- 5: Dumont, Nion Nickel

USA

- 6: Eagle, Lundin Mining
- 7: Idaho (ICO), Jervois Mining
- 8: Iron Creek, Electra Battery Materials
- 9: Madison, US Strategic Metals
- 10: Tamarack, Talon Metals

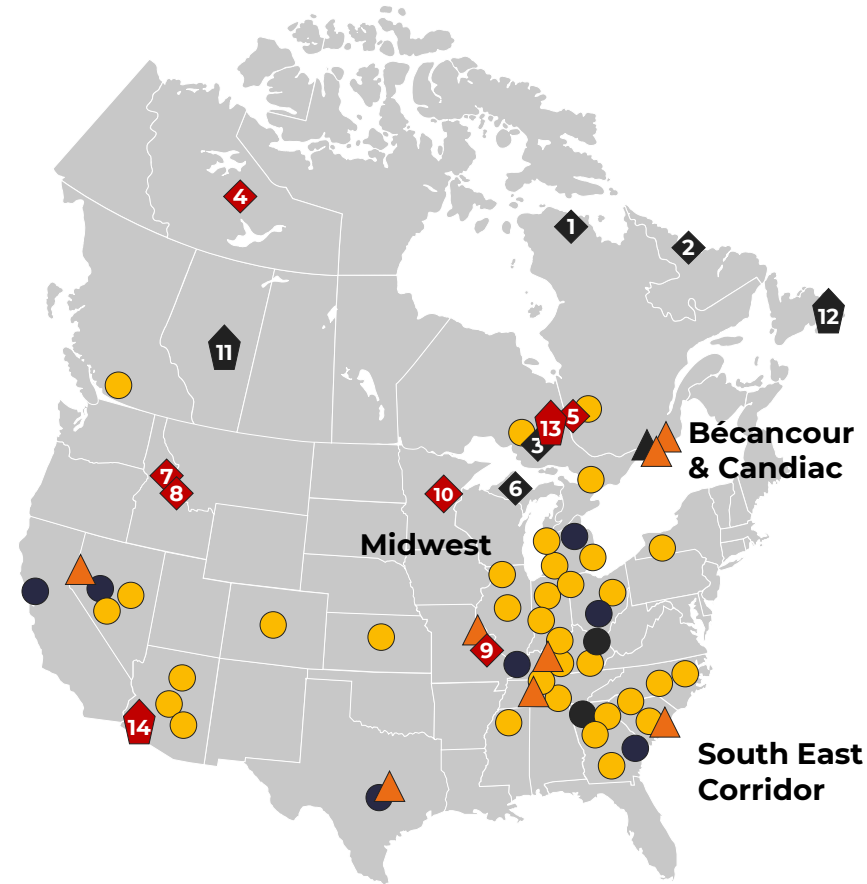
Refining

Canada

- 11: Sherritt
- 12: Vale
- 13: Electra Battery Materials

USA

- 14: EVelocity Energy



See the 2023 Cobalt Market Report for further details

From New York to...



Market pressure to persist

**Large market surpluses
weighing on prices**

**Cobalt maintains a key role in the
energy transition**

**Strong demand growth to
catch up with supply**

**Geopolitics to remain at the
top of the agenda**



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