



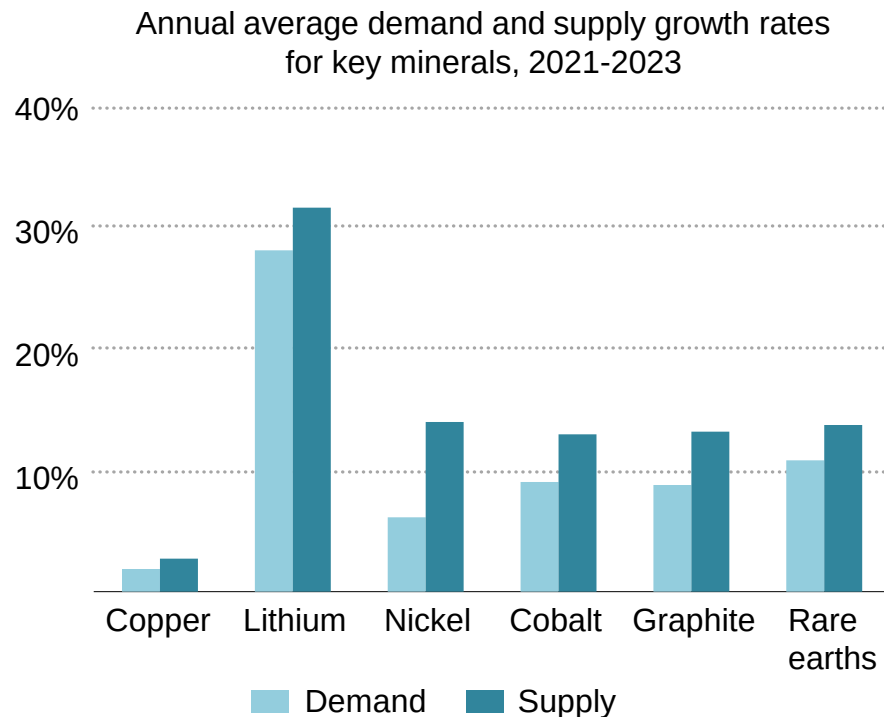
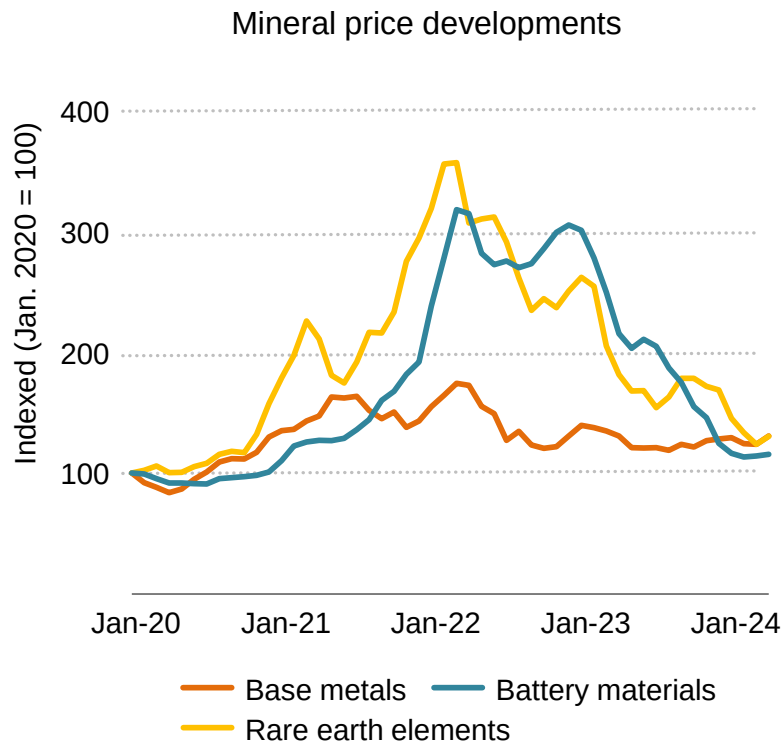
Global Critical Minerals Outlook 2024

TESSD Working Group

Tae-Yoon Kim, Head of Energy Minerals Analysis
30 October 2024

International
Energy Agency

The main story of 2023 – falling prices

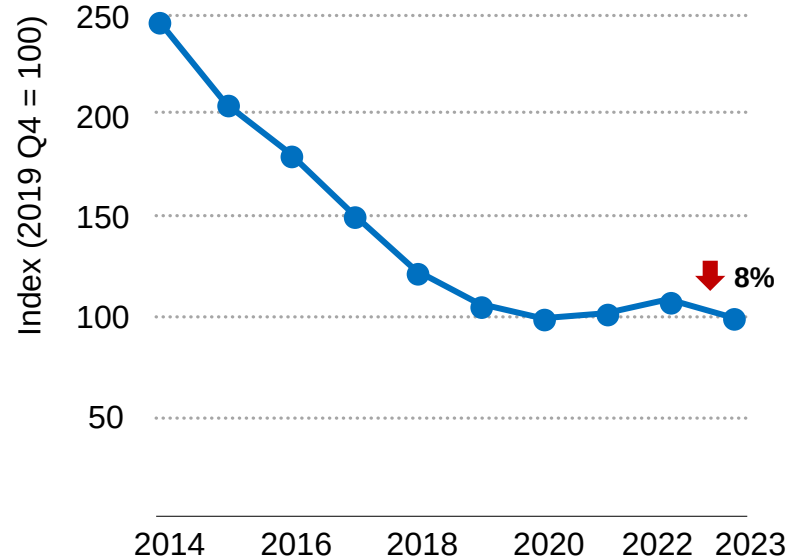


Following two years of dramatic increases, prices for critical minerals experienced a widespread decline in 2023, with battery materials experiencing particularly sharp reductions

Two sides of price declines

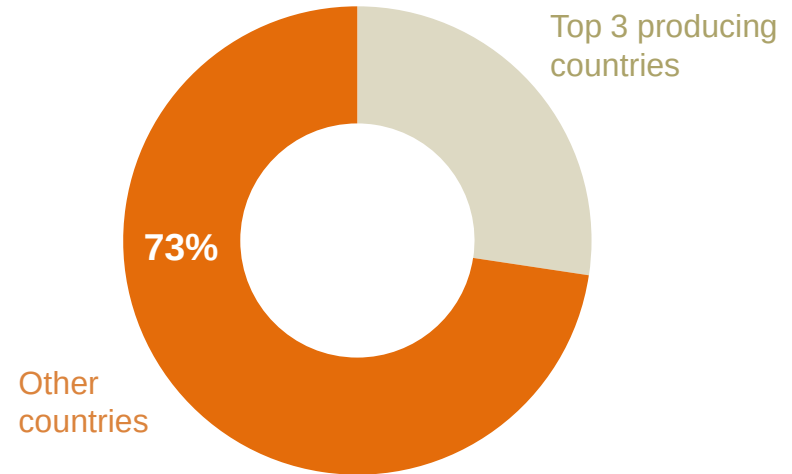
A boon for clean energy deployment

IEA Clean Energy Equipment Price Index



A bane for mineral investment and diversification

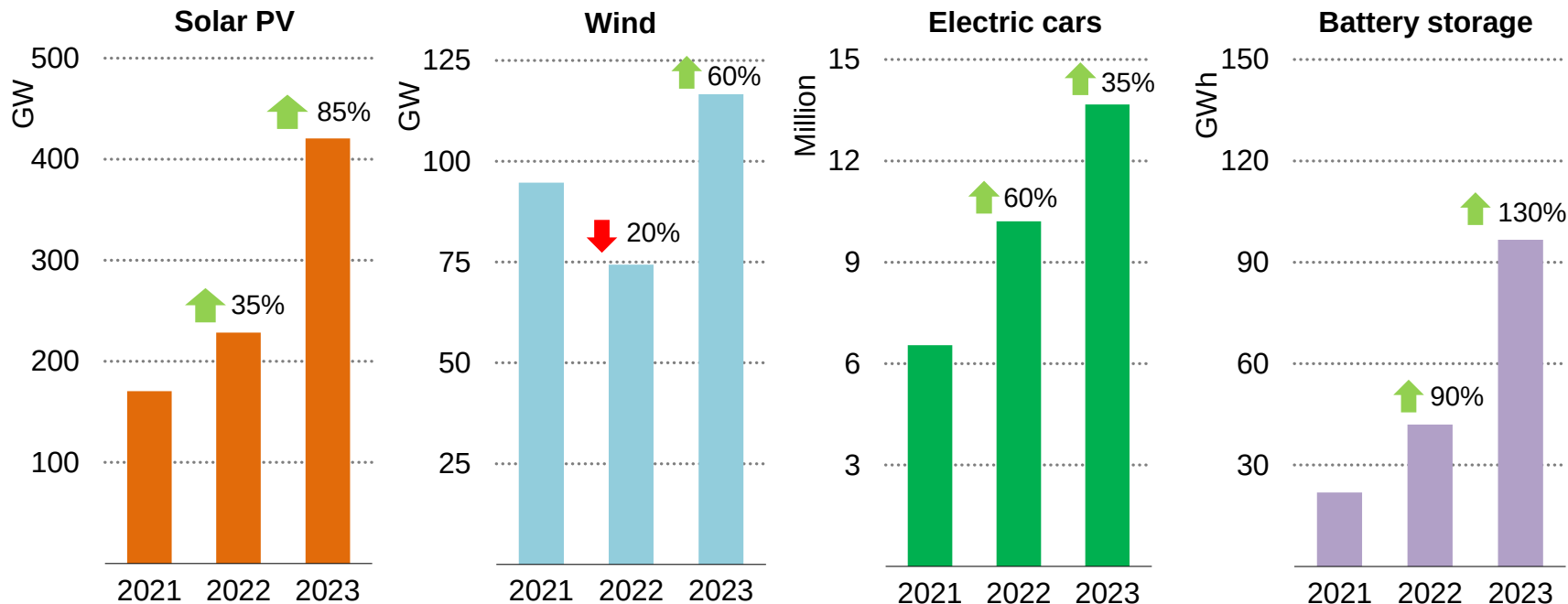
Nickel mine production at risk



Lower prices have been good news for consumers, bringing clean technology costs back on a downward trajectory, but they also make spending to ensure diversified supply less appealing to investors

Robust momentum for clean energy deployment...

Annual capacity additions for selected clean energy technologies, 2021-2023

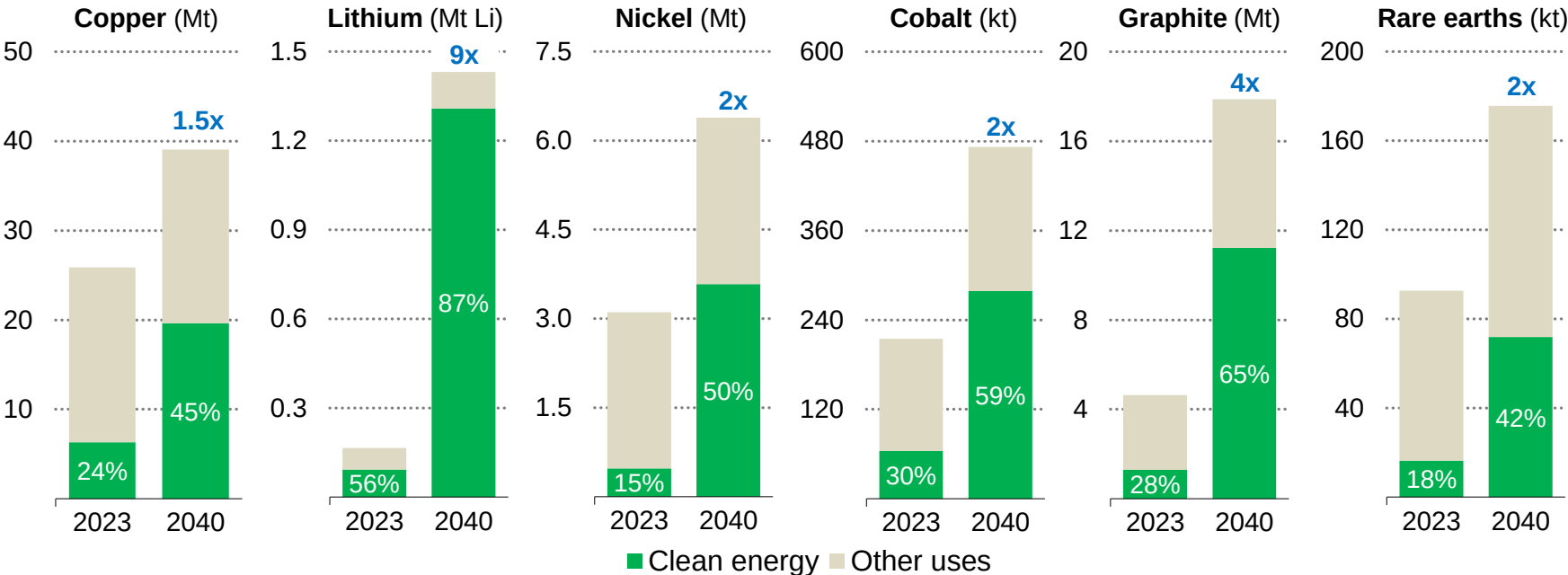


Clean energy deployment continues to advance in all our scenarios for the future, including a strong growth story for solar, wind, EVs and battery storage

....brings strong demand for critical minerals



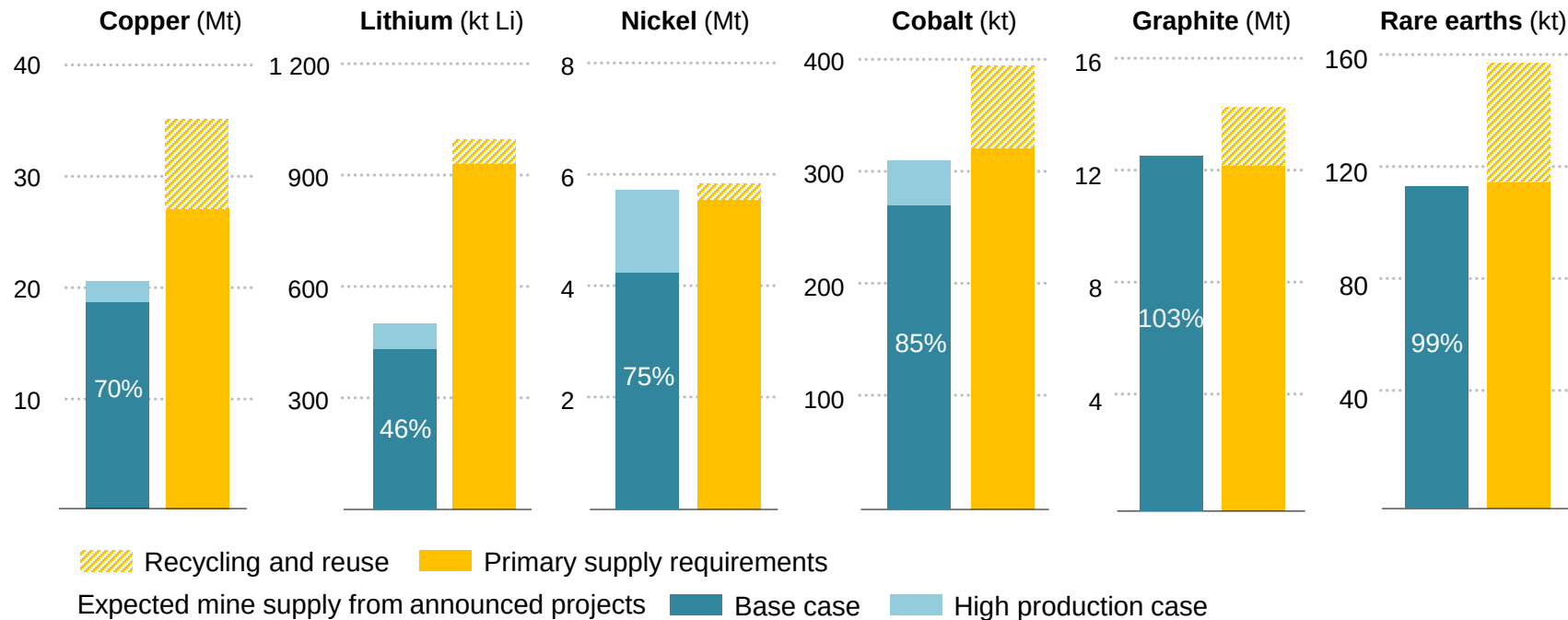
Growth in demand for key critical minerals in the Net Zero Emissions by 2050 (NZE) Scenario



Today's well-supplied market may not be a good guide for the future as demand for critical minerals continues to rise in all IEA scenarios; it almost triples by 2030 and quadruples by 2040 in the NZE Scenario

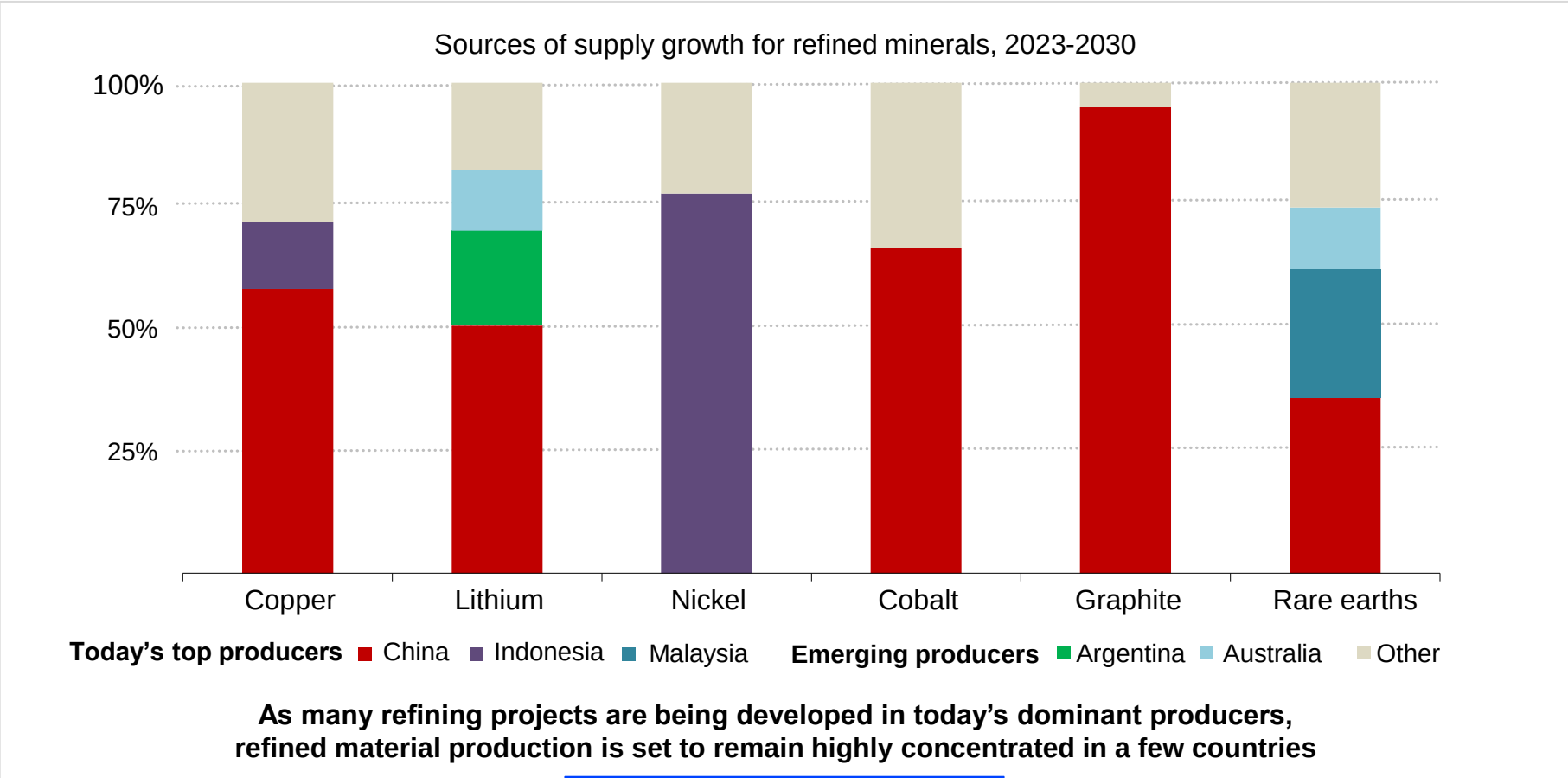
Mixed picture for future balances between demand and supply

Expected mine supply from announced projects and 2035 requirements in the Announced Pledges Scenario (APS)



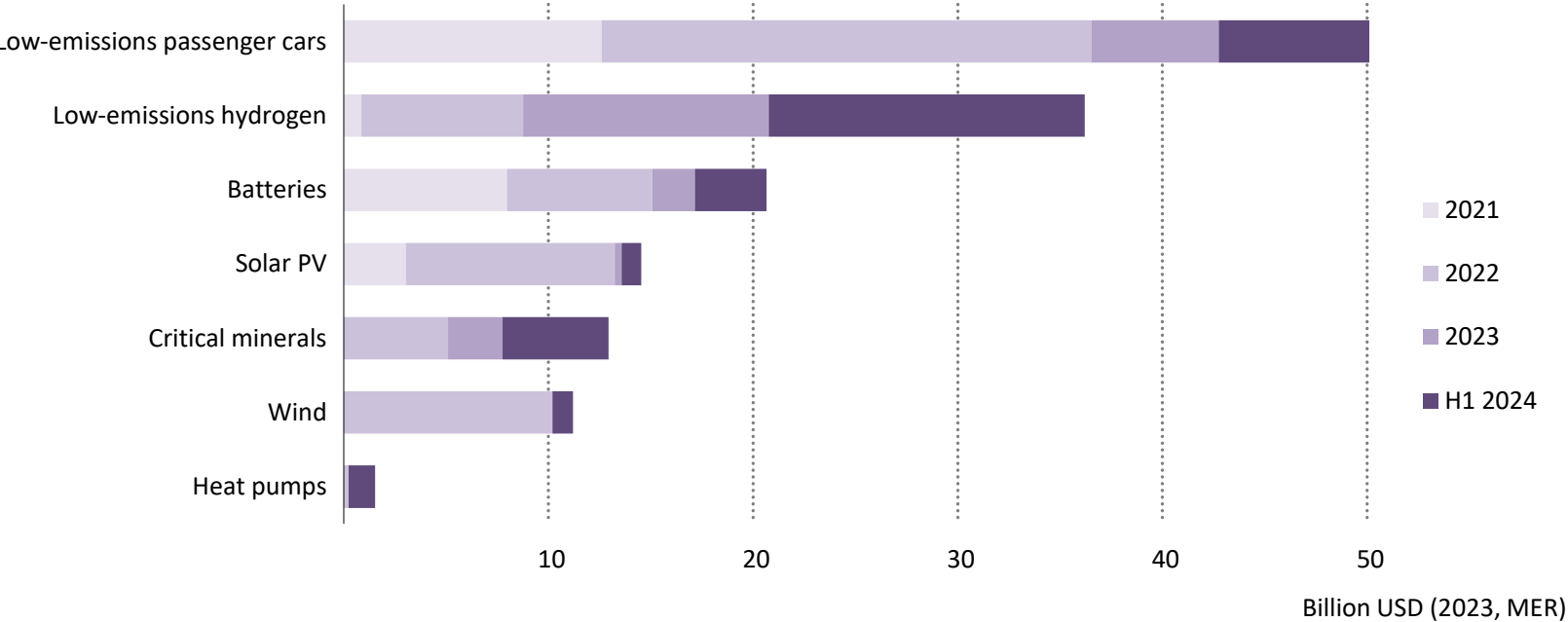
Expected supply from announced projects is within range of projected 2035 requirements to reach national and global climate goals, with the major exceptions of copper and lithium

Limited progress in diversifying supply



Government incentives for supply chain diversification are increasing

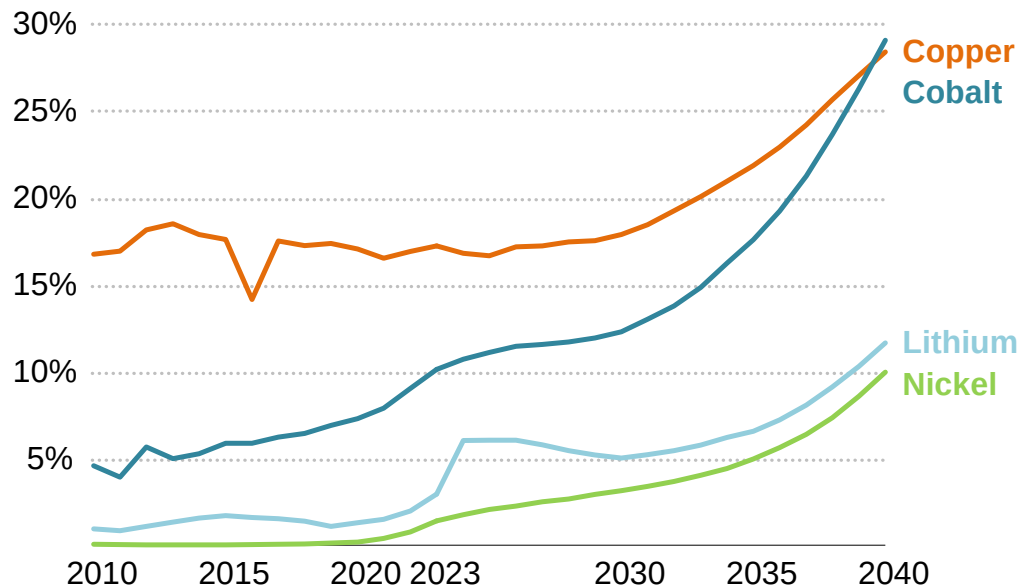
Government incentives for domestic manufacturing of clean energy technologies by announcement year, 2020-H1/2024



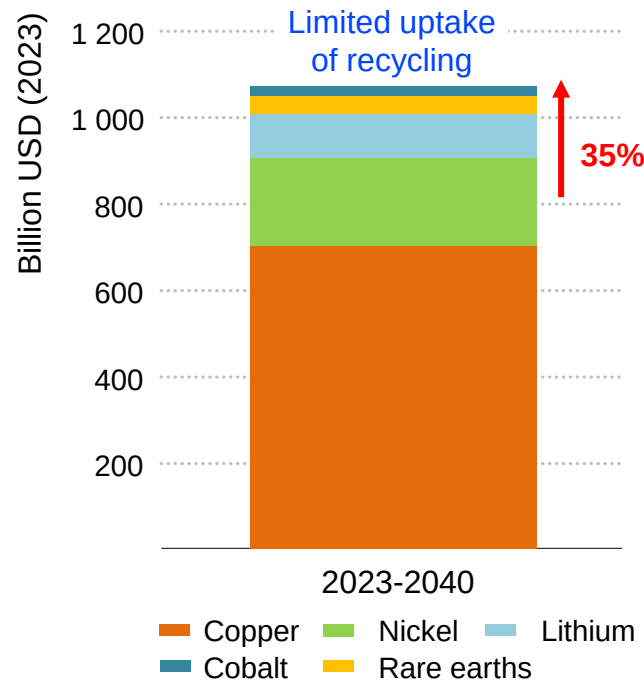
Domestic manufacturing incentives now make up 10% of total government spending allocated since 2020.
Government supports for critical minerals are increasing in recent years

Vital to step up efforts on recycling, innovation and behavioural change

Share of recycling in total supply in the NZE scenario



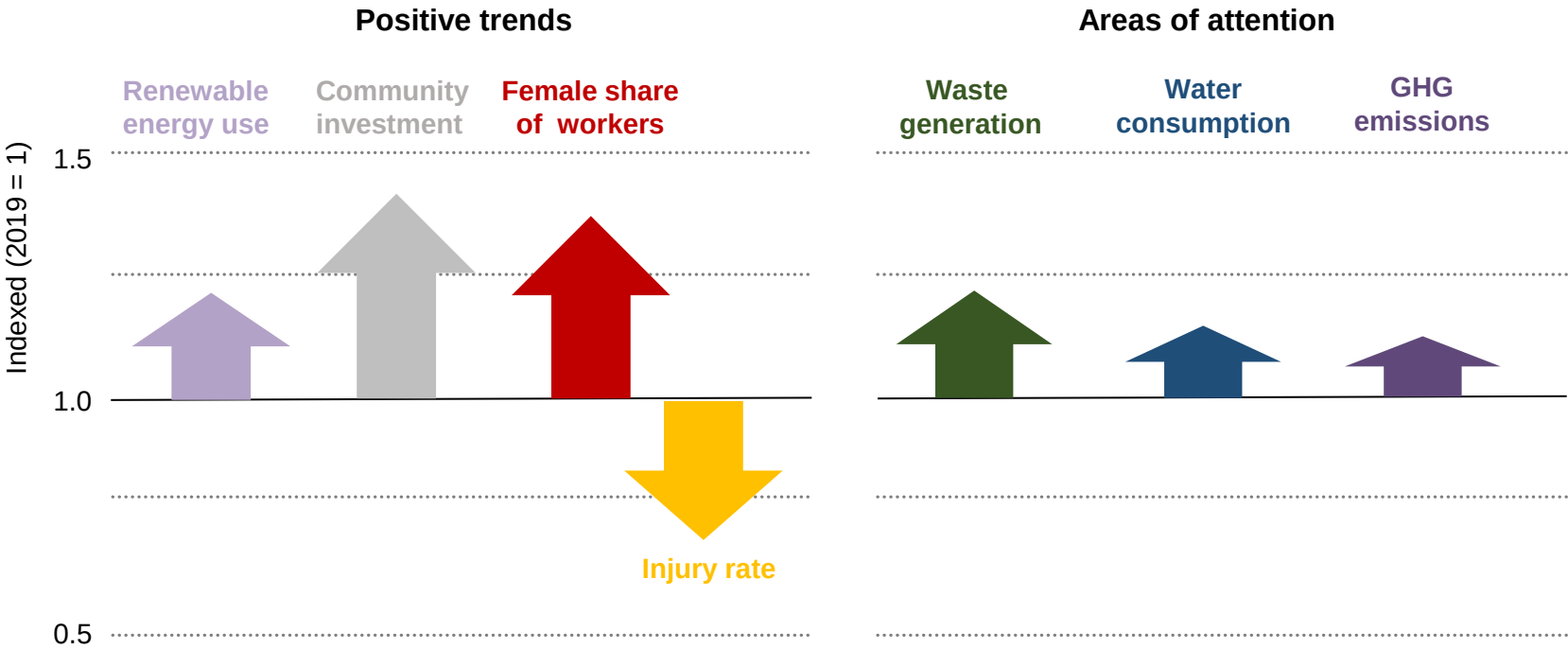
Mining capital requirements in the NZE Scenario



Recycling rates increase substantially with growing policy attention and the rise of battery recycling; Without the uptake of recycling and reuse, mining capital requirements would need to be one-third higher

Progress towards sustainable and responsible supplies

Change in selected ESG performance indicators, 2019 to 2022



Although the industry is making progress on sustainability reporting, it paints a mixed picture with some positive trends but substantial room for improvement



<https://www.iea.org/topics/critical-minerals>