



Where is Mining on the Roadmap to Zero-Emissions?

Energy and Mines 2022

Ewan Norton-Smith, Head of Sales (Australia)





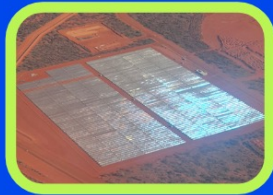
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Key Hybrid Projects



Gruyere

13.6 MW Solar +
4.4 MW BESS +
Gas



DeGrussa

10.6 MW Solar +
6 MW BESS +
Diesel



Northern Goldfields

38.2 MW Solar +
10 MW BESS +
Gas



Agnew

4 MW Solar +
18 MW Wind +
12 MW BESS +
Gas



Greenough River

37 MW Solar



Esperance

9 MW Wind +
4 MW Solar +
5.5 MW BESS +
Gas



Jabiru

4 MW Solar +
4 MW BESS +
Gas



Weipa

5.2 MW Solar +
4 MW BESS +
Diesel



Heron Island

0.4 MW Solar +
0.6 MWh BESS +
Diesel



Jacynth Ambrosia

3.4 MW Solar +
Diesel

Stated 'Net Zero Targets'

Net-zero
2040



Net-zero
2050

BHP

RioTinto



GOLD FIELDS



Drivers of Renewable Energy in Mining

Energy Transition

Low carbon critical materials required at scale

Reliable & Low Cost

Proven low cost technologies, zero fuel price volatility

Financing

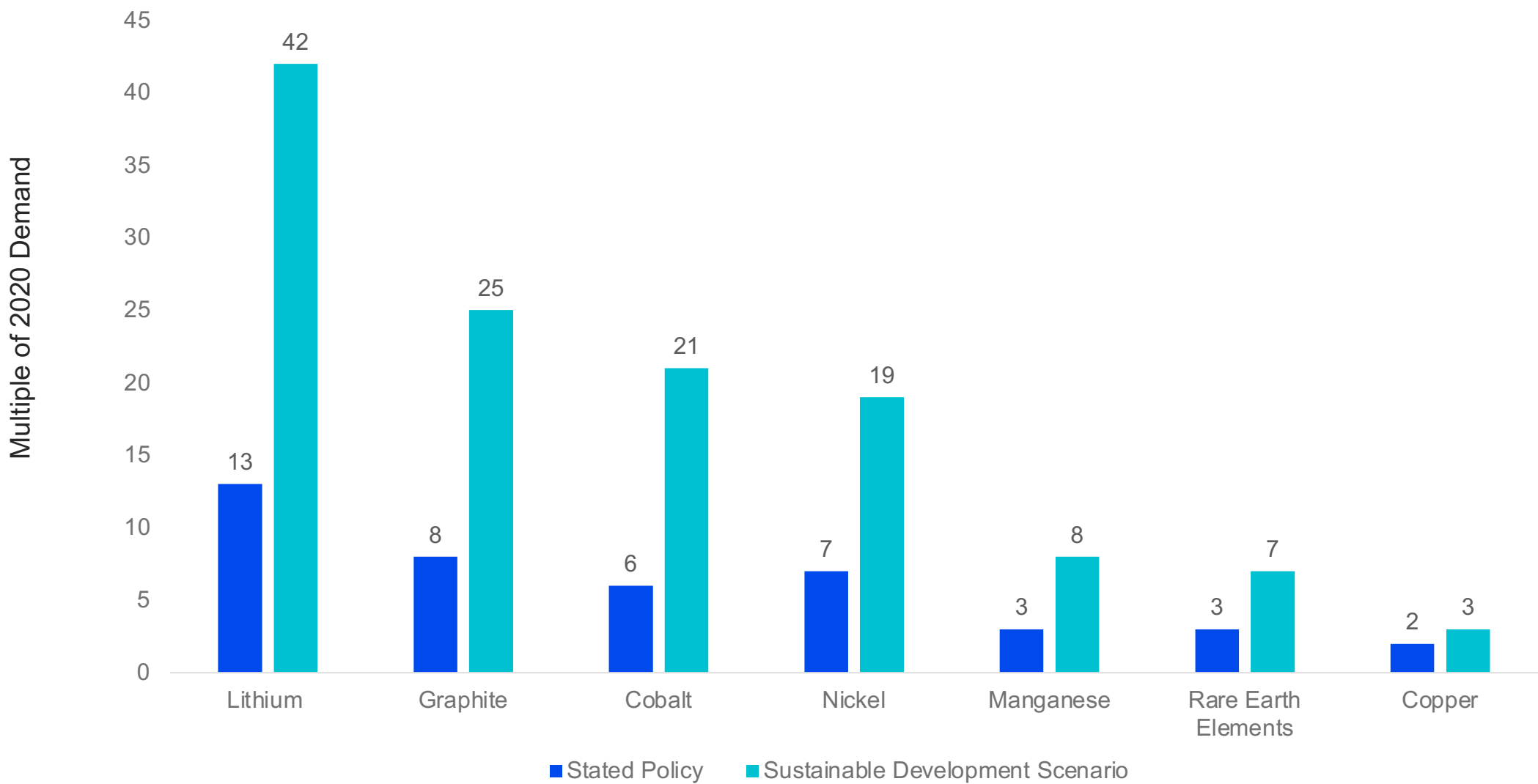
Access to capital
Product pricing

Governance

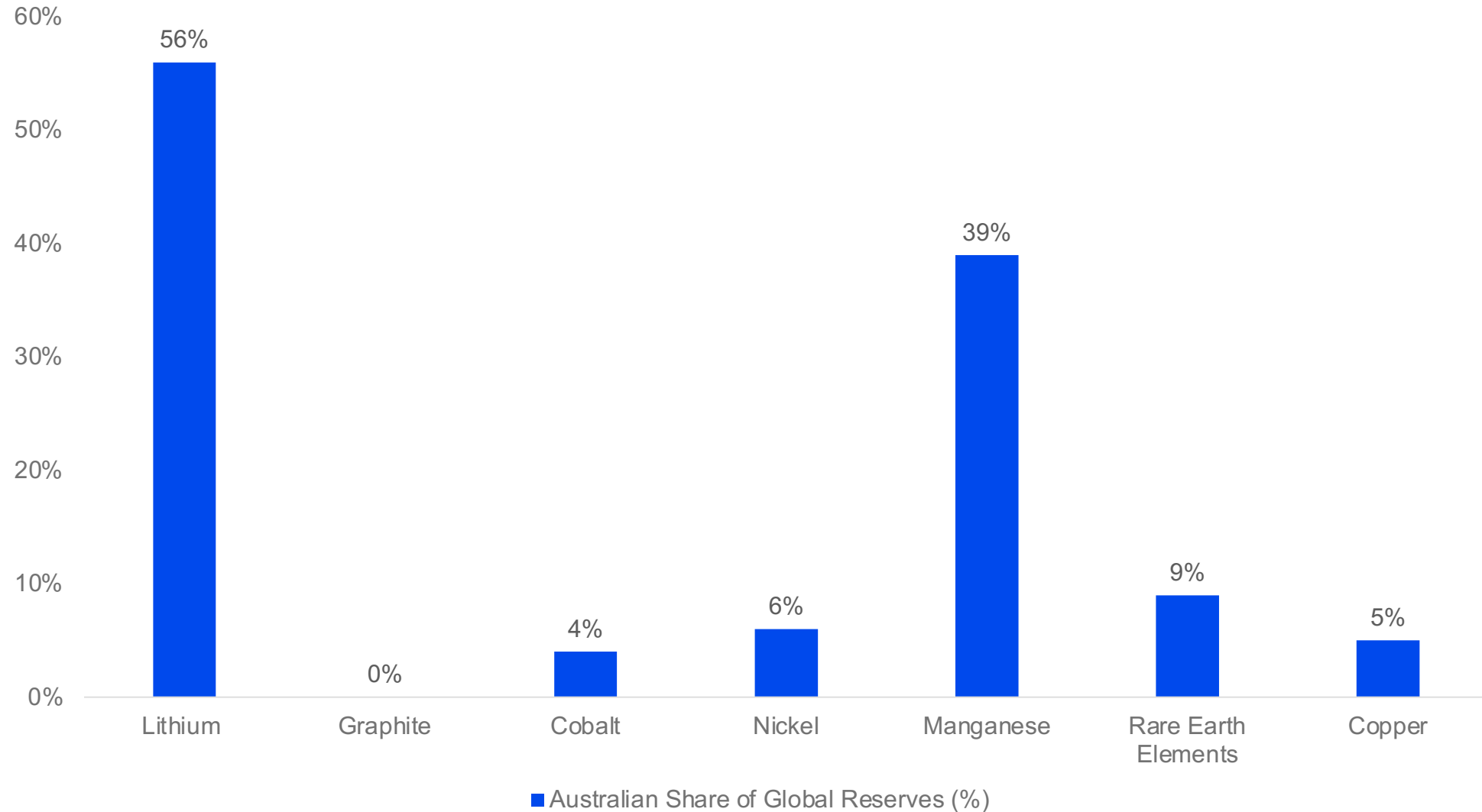
CO2 risk
Supply Chain risk



Example of Critical Energy Mineral Demand (2040)



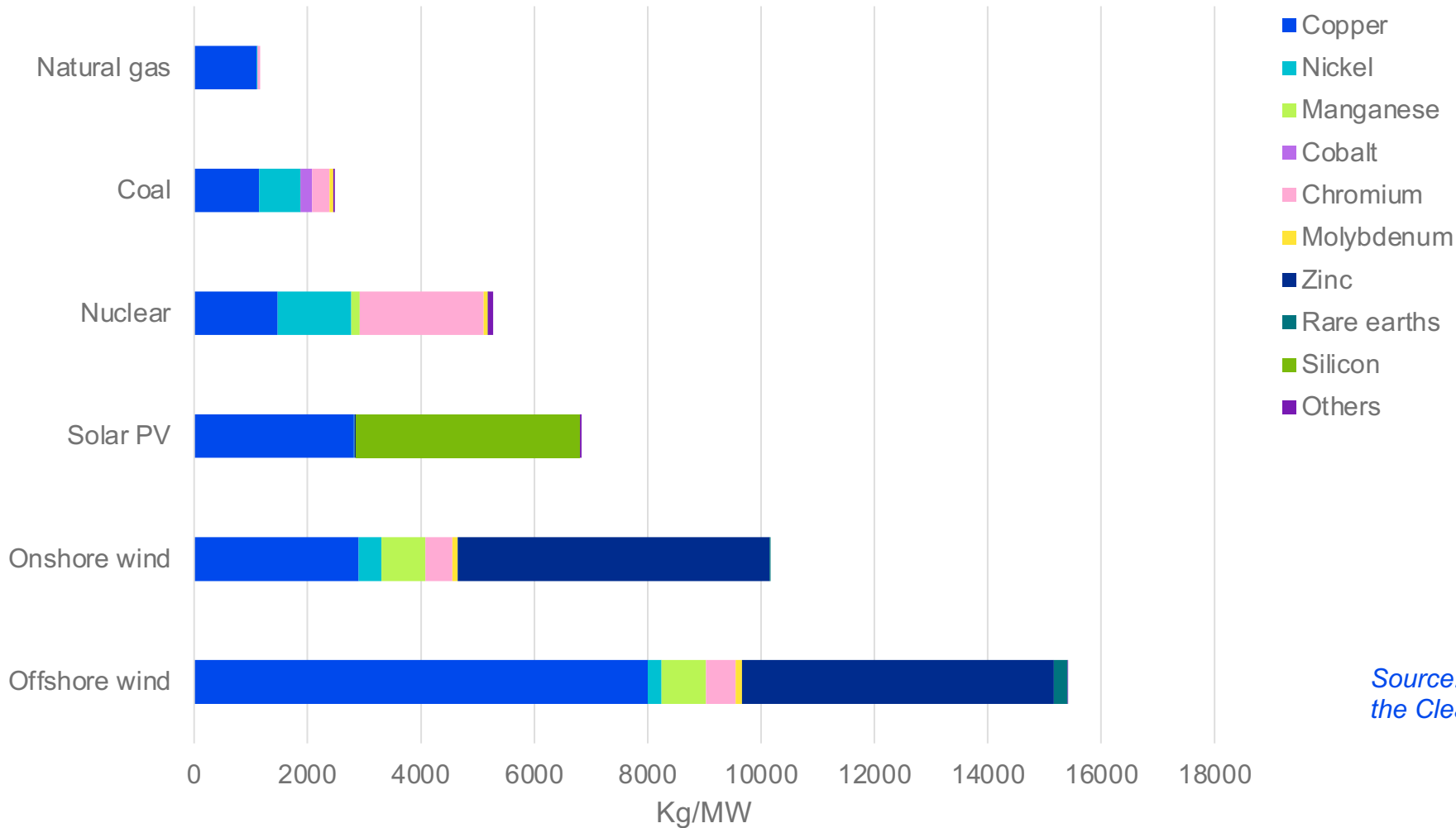
Australian Share of Reserves of Critical Materials



Source: GeoScience Australia 2020

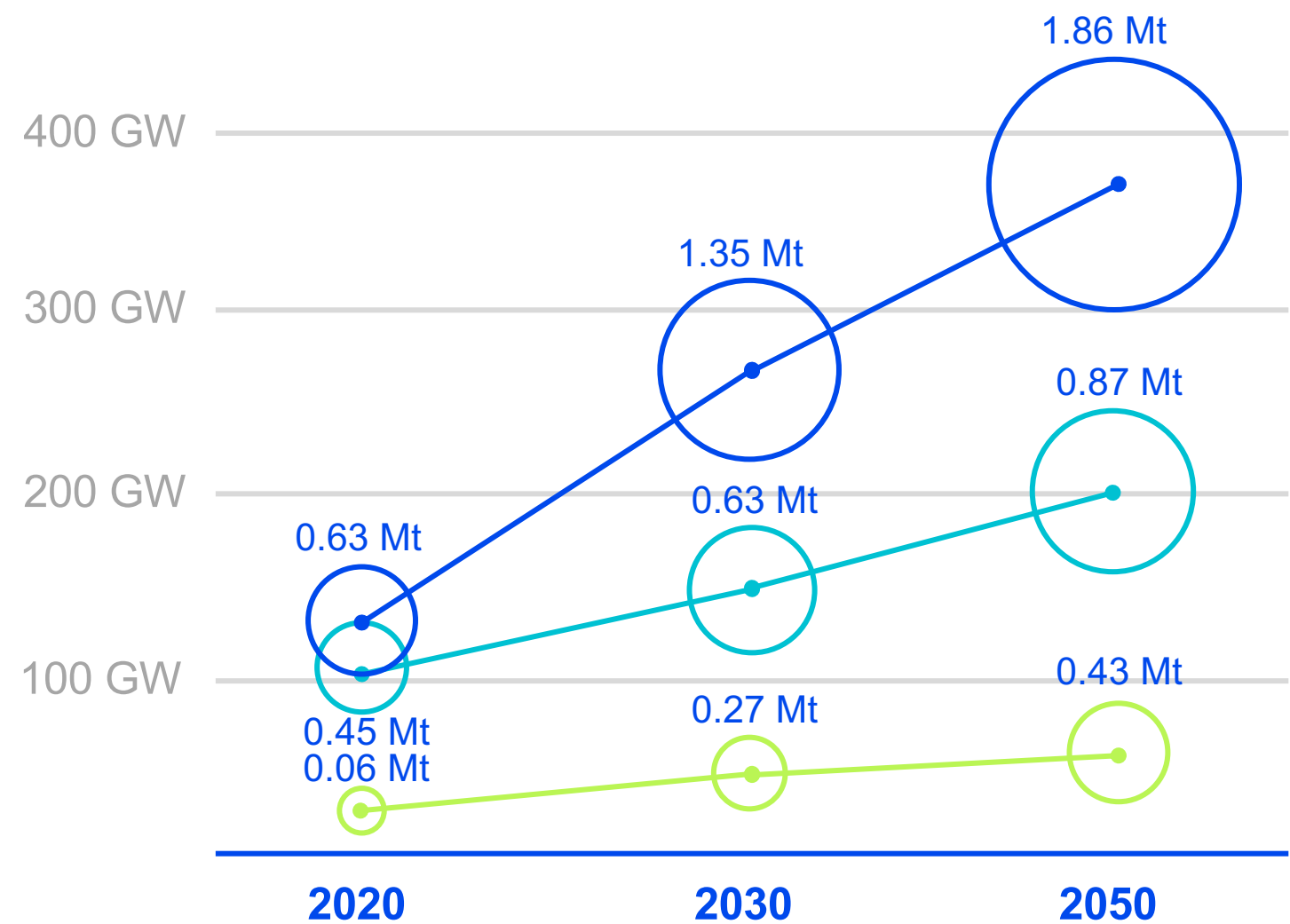
Critical Minerals in the Clean Energy Transition

Minerals used in clean energy technologies compared to other power generation sources



Source: IEA, *The Role of Critical Minerals in the Clean Energy Transition*, May 2021

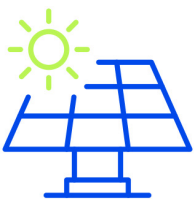
Copper is a key energy transition metal



Solar PV

Onshore Wind

Offshore Wind



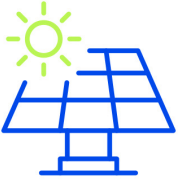
5t copper
per MW



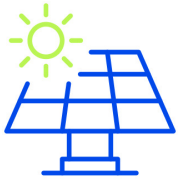
4t copper
per MW

Source: World Bank Group, *The Growing Role of Minerals and Metals for a Low Carbon Future*

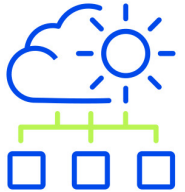
Case Study: TransAlta's Northern Goldfields Solar Project for BHP Nickel-West



27.4 MW Solar Farm at Mt Keith



10.7 MW Solar Farm at Leinster



10.1 MW BESS at Leinster



54,000 tonnes CO₂-e reduction per annum



Up to 50% of Bill of Material of Battery Cell is Nickel



Image courtesy of TransAlta

Path to Carbon Neutrality Now vs Next



Gold Mine 2021

36 MWp

0 MW

7.5 MW
3.5 MWh

89 MW

48 MW

Off-grid Gold Mine 2022 / 23

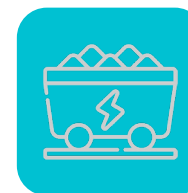
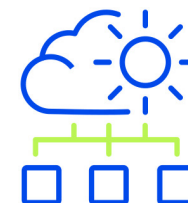
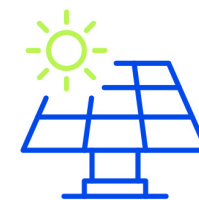
14 MWp

24 MW

13 MW
13 MWh

15 MW

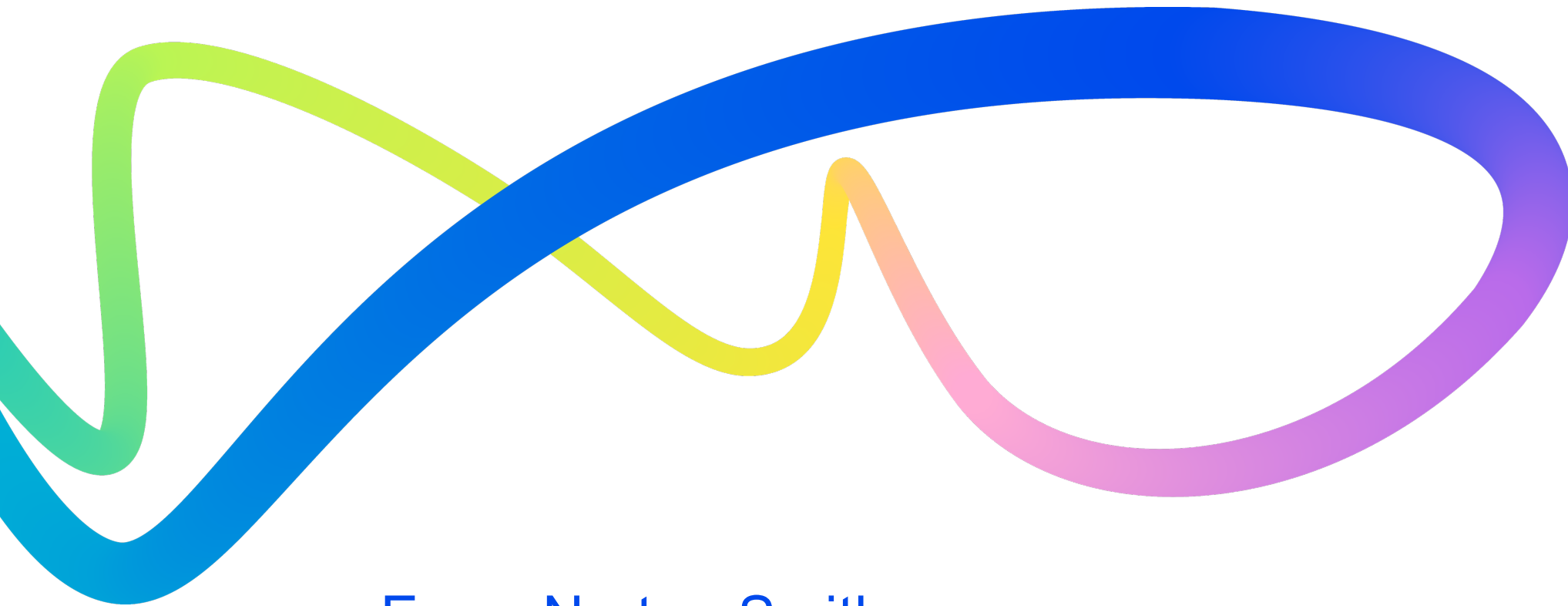
13 MW





Final take away

- The mining industry is progressing well on the pathway to Net Zero in mining
- The pathway is a broader opportunity than just mining – the mining industry will be a critical driver in the renewable energy transition and that transition is only just beginning



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