Zemo LCA Webinar Series:

The effects of ESG-based policies on the lithium sector

Date: 27th October 2021 | **Time:** 14:00 BST

Dominic Wells

Senior Research Analyst

Wood Mackenzie

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Dominic Wells, Senior Research Analyst | 27th October 2021

Wood Mackenzie
A Verisk Business

ESG

Environmental

Combating climate change

GHG emissions

Energy efficiency

Water usage & management

Protecting biodiversity

Environmental management & stewardship

Waste disposal

Social

Equal opportunity

Freedom of association

Human rights

Community relations

Employee engagement

Labour standards

Health & safety

Child labour

Governance

Company values & ethics

Compliance

Equal opportunity

Board & executive compensation

Transparency & accountability

Board independence

Shareholder democracy

Current initiatives and goals

Stockholders throughout the lithium value chain are responding to new regulation and legislation as the fulfilment of ESG metrics become vital for project success

Regulators & EV Manufacturers

Mercedes-Benz

BMW

CATL

Panasonic

TESLA

Cathode Manufacturers

BASF
We create chemistry

LG Chem

umicore

SUMITOMO CHEMICAL

Lithium Producers

SQM

Livent

Sigma Lithium Resources

OROCOBRE

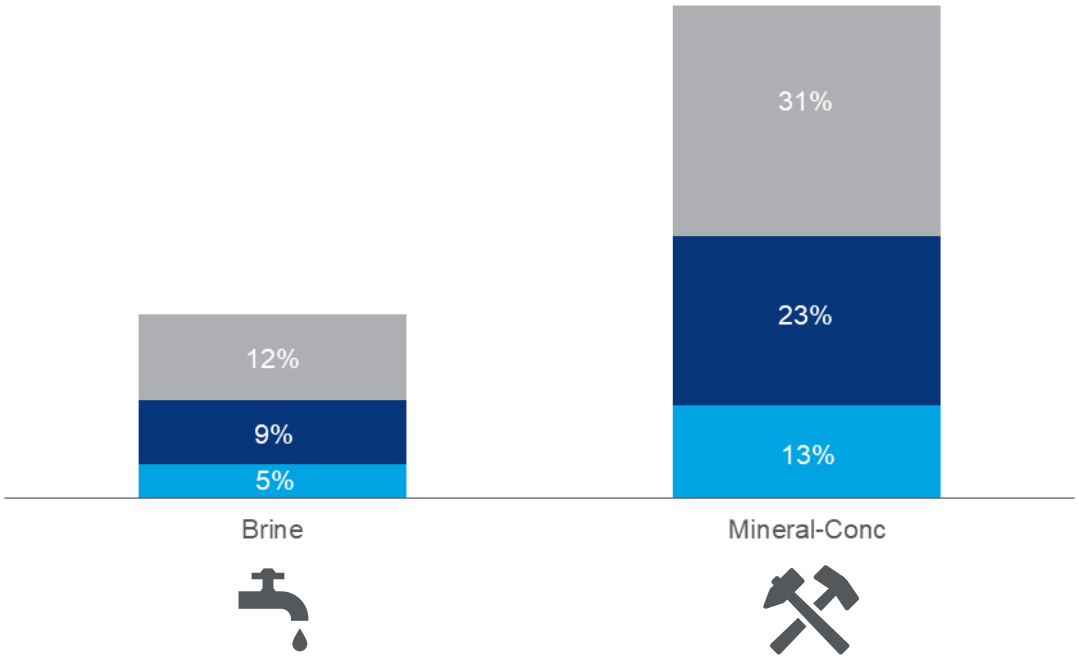
Pilbara Minerals

ALBEMARLE

Carbon taxes will elevate the cost base of lithium producers

Mineral concentrate producers, with their higher energy intensity and greater use of coal in their supply chains, will be the most affected by carbon tax schemes

Increase in 90th centile unit cash costs of lithium producers (2025)



US$60/t: Base Case EU ETS Cost

US$110/t: 2˚C aligned global carbon price

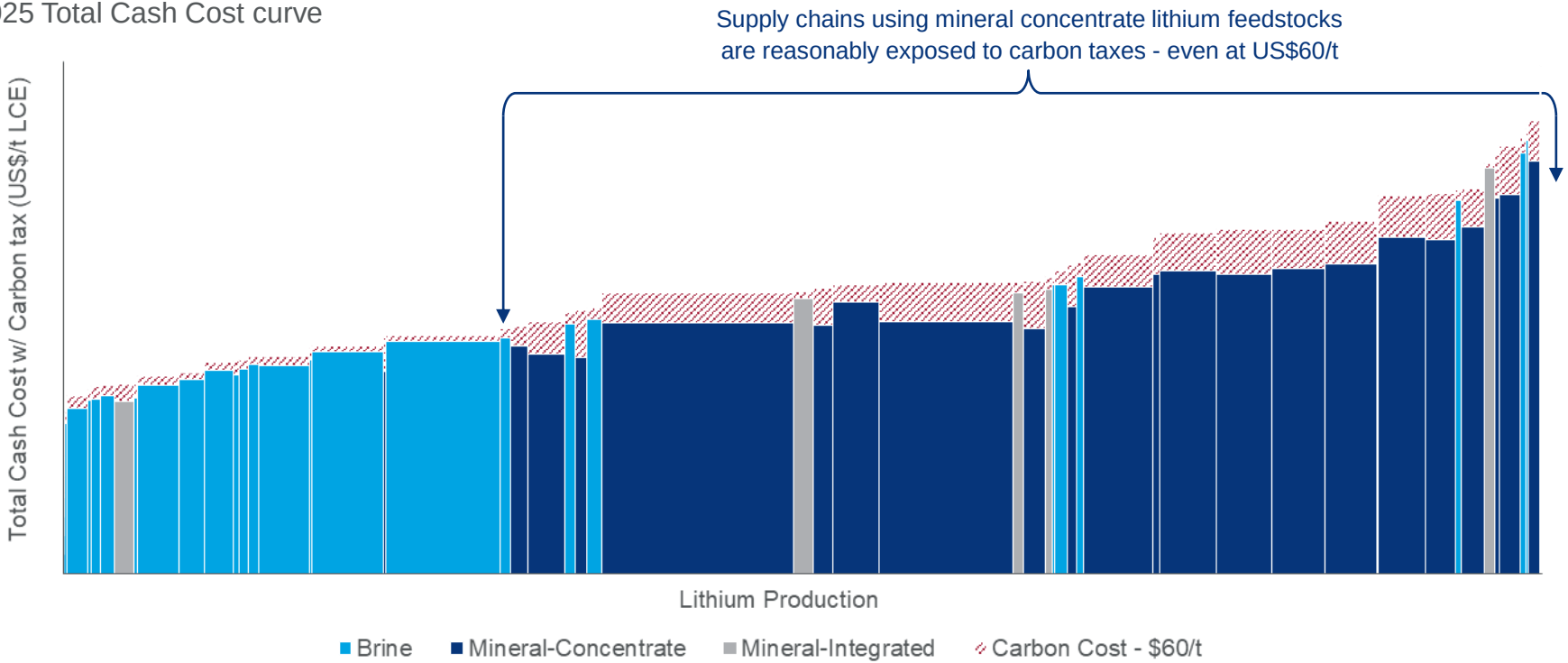
US$150/t: 1.5˚C aligned global carbon price

Lithium produced from hard-rock sources (via an intermediate concentrate) is approximately 3.5X more emissions intense on average than that produced via brine.

Mineral concentrate sources are the most exposed to carbon prices

Very few brine or mineral-clay assets will occupy the higher quartiles of the cost curve, due to their lower cash cost bases and lower CO2 emissions intensity

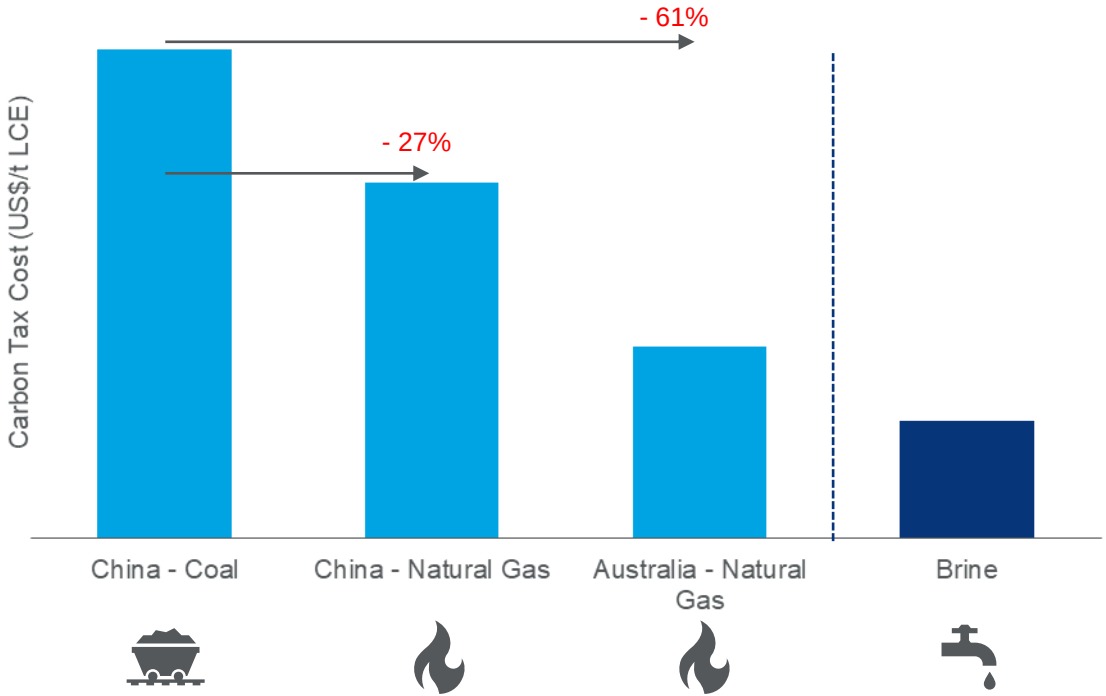
2025 Total Cash Cost curve



The integration from mine to refinery may alleviate some pressure

Spodumene miners are developing domestic refining capacity in Australia which use natural gas fuel for calcining – lowering emissions and carbon taxes

2025 Carbon Costs at differing levels of integration at mineral concentrate producers



The integration of mineral concentrate producers will allow supply chains reliant on these feedstocks to reduce their carbon taxes

Reduction of CO_2 emissions from the mineral concentrate calcining stage via:

1. Replacement of the fuel source with natural gas
2. Reduction in coal use from grid electricity
3. Reduced transport emissions

Closing remarks

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Dominic Wells

Senior Research Analyst

Biography

Dominic is a Senior Research Analyst specialising in battery raw materials. He is responsible for developing sustainability and cost model analysis on current and future mining and refining operations.

Dominic graduated with a Distinction MSc in Advanced Mineral Resources Development from TU Bergakademie Freiberg, MU Leoben and China University of Mining and Technology, where he completed his thesis in proposed remediation operations of brownfield former mining sites. Prior to this he completed his BSc in Geology at the University of Brighton where he also specialised in remediation of former mine sites.

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