

# THE GLOBAL LEADER IN LITHIUM MICA PROCESSING

## Corporate Update: Noosa Mining Conference

10-12 November 2021



LEPIDICO



# THE FUNDAMENTALS: VERTICALLY INTEGRATED FROM MINE TO LITHIUM CHEMICAL

Lepidico's tech-focused, pilot-proven, ESG-led business model delivers lithium from far less contested mineral sources, with first delivery due in late 2023

## Market

ASX

## Ticker

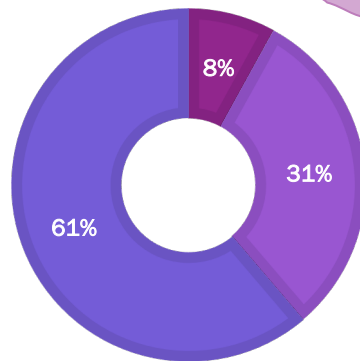
LPD

## Market Cap

A\$295m  
(share price A4.8c)  
(at 8 November 2021)

## Cash

A\$11.9m  
(no debt)  
(at 30 September 2021)



- Board and Management
- Top 40 Public shareholders
- Balance

Corporate Office,  
Toronto, Canada

Phase 1 Chemical  
Plant, Abu Dhabi, UAE

Karibib Project, Namibia  
Phase 1 Mines &  
Concentrator

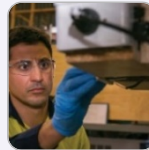
Pilot Plant & Registered Office,  
Perth, Australia



# Corporate Timeline

## 2019

- ✓ LOH-Max® provisional patent application
- ✓ Acquisition of TSX-V listed Desert Lion Energy & Karibib assets
- ✓ Pilot Plant confirms viability of L-Max® technology
- ✓ First L-Max® patent protection received



## 2021

- ✓ EPCM contract awarded
- Front End Engineering & Design to complete
- First product offtake agreements



## 2023

- Chemical Plant commissioning starts
- Project fully operational
- Phase 2 Feasibility Study starts



## 2017

- ✓ Pre-Feasibility Study complete
- ✓ Phase 1 Feasibility Study starts

## 2013-2015

- ✓ 2013 L-Max® process concept
- ✓ 2014 Provisional patent application
- ✓ First continuous lab trials 2015

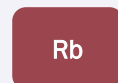


## 2016

- ✓ ASX listing
- ✓ Company name change to Lepidico Ltd
- ✓ PFS starts

## 2018

- ✓ L-Max® Pilot Plant development
- ✓ Provisional patent application for Cs & Rb separation process



## 2020

- ✓ Inaugural Ore Reserve estimates for Rubicon and Helicon announced
- ✓ World's only Ore Reserve estimate for "Critical Minerals" Cs & Rb
- ✓ Phase 1 Project DFS completed
- ✓ Namibia ESIA & ESMP completed to IFC Standards

## 2022

- Phase 1 full funding package
- Karibib mining commences
- Karibib concentrator ore commissioning starts



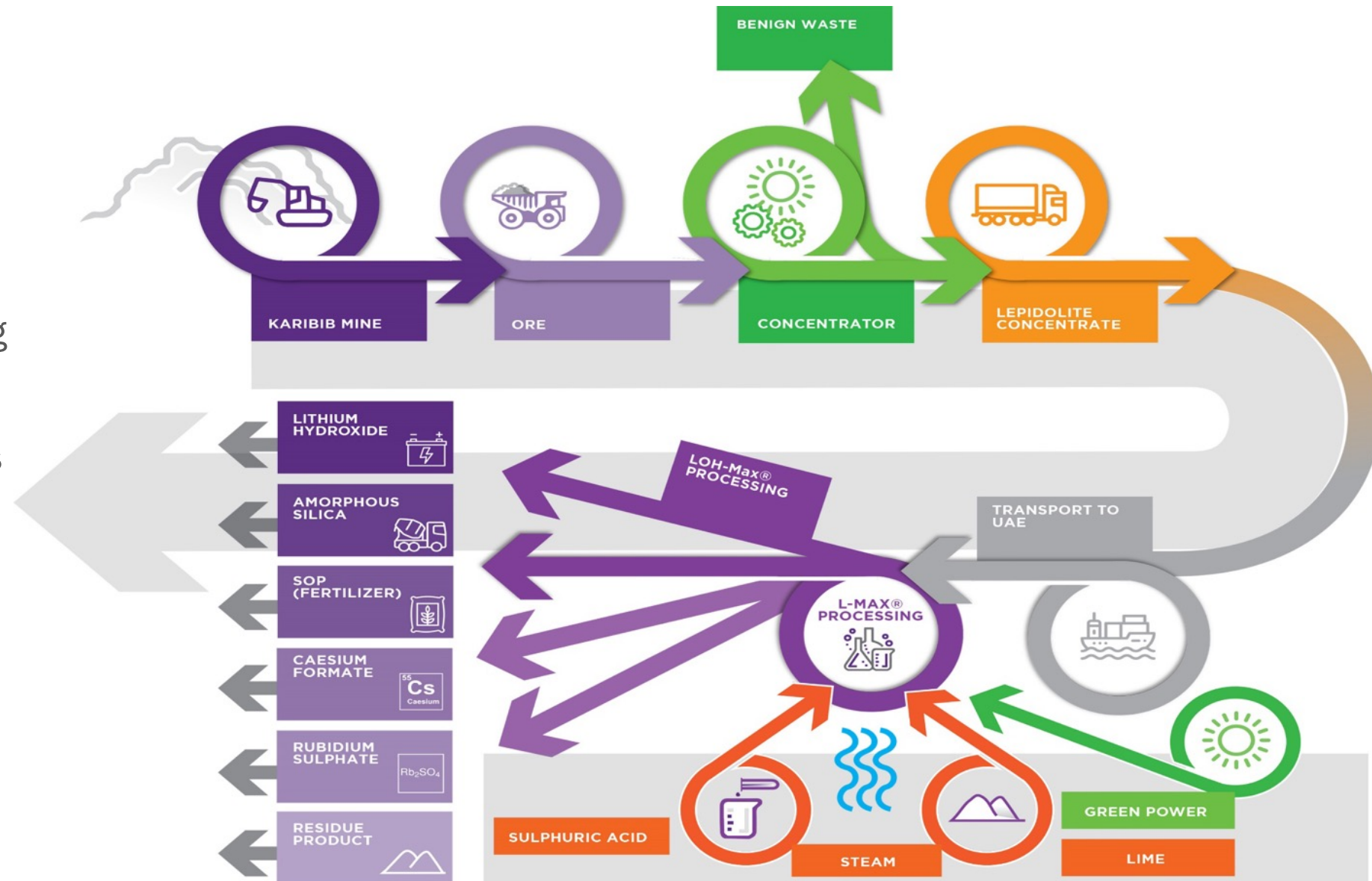
Legend

- ✓ Achieved
- Target

# THIS IS WHAT WE DO: FROM MINE TO MARKET – a low carbon value chain

When operations come on stream in 2023, lithium mica ore mined and concentrated in Namibia will be shipped as concentrate for processing in the UAE.

Our patented technologies transform the concentrate into lithium hydroxide - or carbonate - as well as in-demand strategic chemicals, caesium and SOP - and other saleable outputs.





# OUR TECHNOLOGIES & ESG



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# L-Max<sup>®</sup> – the conversion solution for Li-mica minerals

- **Innovation:** efficiently leaches and refines lithium from less contested lithium micas and phosphates
- **Patents:** Australia, Europe, Japan & US patent protection received for this Lepidico owned technology
- **Sustainable:** utilises common use, inexpensive reagents; conventional equipment; operates at atmospheric pressure and modest temperatures; is energy efficient; and has modest emissions
- **High value:** as well as caesium-rubidium by-products, L-Max<sup>®</sup> also delivers potassium sulphate fertiliser (SOP), amorphous silica and gypsum residues; with zero-solid waste potential
- **Scalable:** a larger Phase 2 Plant is expected to reduce already competitive capital intensity<sup>1</sup>: US\$10,500/t after credits @ 20,000tpa LCE



# LOH-Max<sup>®</sup> - a more sustainable Lithium Hydroxide solution<sup>1</sup>

- **Patent** – provisional patent lodged early 2019; international patent phase started August 2020; national and regional phases started September 2021
- **Broad application** – in lithium mineral conversion that employs sulfur-based chemistry; includes Spodumene
- **Recovery enhanced** – +4% versus conventional Spodumene process; +1,000tpa LiOH at nominal 20,000tpa rate
- **CapEx reduced** – by US\$52M (14%) on 20,000tpa LCE reference case Spodumene converter on simplified flowsheet
- **OpEx reduced** – by US\$8M pa versus reference Spodumene converter case on lower power and reagent consumption
- **CO<sub>2</sub> reduced** – lower Scope 1, 2 and 3 emissions versus conventional processing
- **Value enhanced** – by +US\$100M per 20,000tpa LiOH.H<sub>2</sub>O over 10-years
- **Waste** – benign gypsum/alunite waste
- **Risk reduced** – as sodium sulphate not produced; a potential fatal flaw for conventional plants if disposal required
- **Ownership** – 100% owned by Lepidico; royalty sharing arrangement with original developers for third party licenses



<sup>1</sup> ASX Announcement: LOH-Max<sup>®</sup> process technology acquisition & improvements, 29 October 2020

# Caesium - a much needed new supply source

- **Market** – c.1,000-1,200t pa globally on a Cs metal basis
- **Pollucite** – global Reserves of this traditional source of Cs materially depleted in 2018-19; lepidolite is the next best source of Cs
- **Deficit** – consumers advise 1 of just 2 size producers is ceasing Cs chemical production in 2021'22, leaving a single supplier; a c.40% deficit looms
- **Sustainable applications** – Cs based catalysts used in chemical manufacture; reduce melting point & therefore energy consumption, & enhances yields
- **Patents** – provisional patent lodged 2018 for Cs & Rb extraction process from mica minerals, national phase started 2020; Cs-Rb-K ternary catalyst material refining process provisional patent lodged 2021
- **Cs chemicals** – sulphate, hydroxide and carbonate represent a large part of the industrial market; Lepidico's proprietary processes refine  $\text{Cs}_2\text{SO}_4$ , which can be converted to  $\text{CsOH}$  & in turn  $\text{Cs}_2\text{CO}_3$  via  $\text{CO}_2$  sequestration
- **Sustainable processes** – an L-Max residue stream is the feed for these hydrometallurgical processes which employ conventional equipment and operate at atmospheric pressure





# Environmental excellence through technology

- **Competitive carbon intensity** – GHD reported “low” chemical plant emissions intensity vs other LiOH plants; 8.8tCO<sub>2</sub>-e/t LiOH.H<sub>2</sub>O (10.0tCO<sub>2</sub>-e/t LCE) for integrated project Scope 1 & 2 emissions – 90% in chemical plant, 10% mine & concentrator; renewable power and green hydrogen can lower emissions to just 3.0tCO<sub>2</sub>-e/t LCE
- **Other emissions & pollutants** – negligible
- **Water intensity** – 33m<sup>3</sup>/t LCE, 44% allocation to LiOH; 20% Namibia/80% UAE for first 5 years, with 85% of concentrator water recycled
- **Land use intensity** – 962Ha integrated project on predominantly industrial land; mine closure plan to return land to agricultural use; Category B designation
- **Biodiversity** – ESIs identifies no material impacts at Karibib & UAE operations are located within a designated industrial park
- **Industrial waste generation** – no TSF required, benign mine and concentrator waste co-disposed; no sodium sulphate generated from converter; & opportunity for zero solid waste chemical plant





# Social Responsibility & Governance

## Health & Safety

- Lost Time Injury & Total Recordable Incidents Frequency Rates 0 > zero harm
- More than 118,000 hours worked with no Recordable Incidents since records began in 2016



## Social

- Creation of 115 direct jobs and +800 indirect jobs in Namibia
- 119 new direct jobs in the UAE
- No relocation requirement
- Water supply to local farmers
- Medical equipment donation



## Governance

- Experienced Board of Directors with complementary skills
- Sustainability & best practice ESG integrated with strategic planning
- Diversity Committee established
- Risk register including a residual risk rating for all actions and controls





# OUR PHASE 1 PROJECT



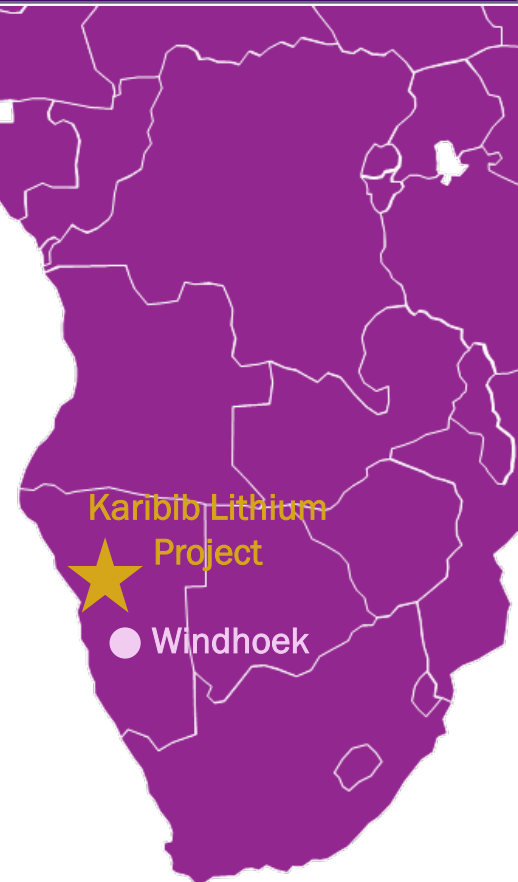
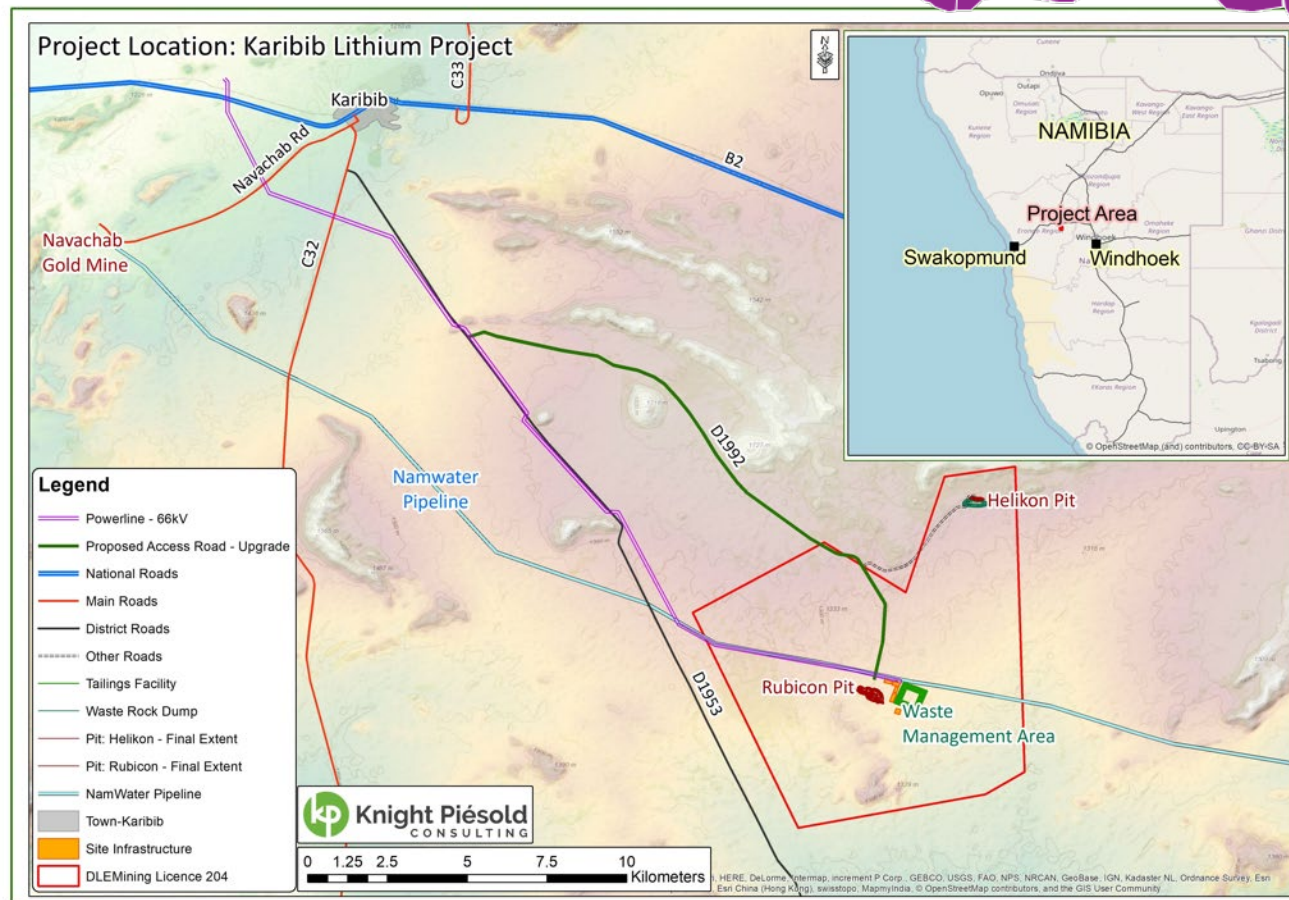
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# Karibib Project, Namibia

- Brownfield re-development of Rubicon & Helikon mines
- Fully permitted: Granted 68km<sup>2</sup> Mining Licence
- Water extraction licence given - 85% of process water will be recycled
- Construction of new small-scale 60,000tpa concentrator
- Direct access to excellent existing regional infrastructure
- New 25km line for grid power
- +1,000km<sup>2</sup> land position prospective for lithium, caesium, rubidium & gold



Exploration: Mineral Resource expansion programs started mid-2021 to extend Phase 1 life & support the Phase 2 Project Scoping Study



# RESERVES & RESOURCES: Unique source of Critical Minerals

## Ore Reserve Estimate<sup>1</sup> Rubicon & Helikon 1 deposits

Reserve Category	Tonnes (M)	Li <sub>2</sub> O (%)	Rb (%)	Cs (ppm)	Ta (ppm)	K (%)
Proved	1.93	0.59	0.28	410	50	2.10
Probable	4.79	0.41	0.21	290	40	1.99
<b>Total Reserves</b>	<b>6.79</b>	<b>0.46</b>	<b>0.23</b>	<b>320</b>	<b>50</b>	<b>2.02</b>

- JORC Code (2012) compliant Ore Reserve estimate for lithium, rubidium, caesium & potassium
- 76% conversion of Measured & Indicated Resources to Reserves for a 14-year project life
- Inferred Resource potential supports expansion potential or Phase 2 Project development
- Ore exposed at surface and deposits pre-stripped by historical mining
- Strip ratio just 0.5 to 1 for the first 2 years and 3.8 to 1 Life of Mine
- Most mine development work complete including haul road to Helikon 1 & water supply

## Karibib Project Global Mineral Resources<sup>2</sup>

Deposit	Resource Category	Tonnes (M)	Li <sub>2</sub> O (%)	Rb (%)	Cs (ppm)	Ta (ppm)	K (%)	Cut-off (% Li <sub>2</sub> O)
Rubicon & Helikon 1 <sup>3</sup>	Measured	2.2	0.56	0.27	389	51	2.14	0.15
	Indicated	6.66	0.38	0.20	274	42	2.07	0.15
	Inferred	0.17	0.7	0.29	1100	150	2.18	0.15
Helikon 2, 3, 4 & 5 <sup>4</sup>	Inferred	2.2	0.41					0.20
Rubicon tailings <sup>5</sup>	Indicated	0.07	0.99	0.42	538	60		0.00
Rubicon & Helikon stockpiles <sup>5</sup>	Inferred	0.57	0.79					0.00
Global	Measured	2.2	0.57	0.27	389	51	2.14	
	Indicated	6.73	0.39	0.21	277	42		
	Inferred	2.94	0.5					
	<b>Total</b>	<b>11.87</b>	<b>0.45</b>					

<sup>1</sup> ASX Announcement: DFS Delivers Compelling Phase 1 Project Results, 28 May 2020

<sup>2</sup> Resources are inclusive of Ore Reserves

<sup>3</sup> ASX announcement dated 30 January 2020: Updated Mineral Resource Estimates for Helikon 1 and Rubicon

<sup>4</sup> ASX announcement dated 16 July 2019: Drilling starts at the Karibib Lithium Project

<sup>5</sup> ASX announcement dated 12 March 2021: Karibib Mineral Resources Expanded



# Karibib Concentrator – conventional flotation, small footprint

- Lycopodium started EPCM works May 2021
- FEED to complete December Quarter 2021
- Site works start March quarter 2022
- Mining December quarter 2022
- Concentrator commissioning late 2022





# Phase 1 Chemical Conversion Plant – Abu Dhabi

- Lycopodium started EPCM works May 2021
- 25 year land lease agreement October 2021
- FEED to complete December Quarter 2021
- Construction start June quarter 2022
- Chemical plant commissioning second half 2023

- Located in Khalifa Port Free Trade Zone, Abu Dhabi – no corporate tax and duties; 100% foreign ownership
- Existing infrastructure available through “plug and play” approach
- Abu Dhabi ESIA complete and environmental permit to construct in place

# Phase 1 Project Definitive Feasibility Study<sup>1</sup>



Construction Cost  
(Inc. 13% contingency)  
**US\$139M**



Post Tax  
**NPV<sub>8</sub> of US\$221M**  
**NPV<sub>0</sub> of US\$521M**  
**IRR of 31%**



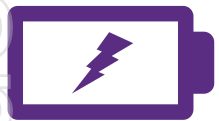
Project Payback  
(from start of production)  
**3 years**



Operating Costs  
(by-product LCE basis)  
**C1 Cash Cost US\$/t 1,656**  
**ASIC US\$/t3,221**



Average Annual  
Free Cash Flow<sup>3</sup>  
(post ramp-up)  
**US\$49M**



Lithium Hydroxide  
Production<sup>2</sup>  
**4,879 tpa**



Sulfate of Potash  
Production<sup>2</sup>  
**12,000 tpa**



Caesium Sulfate  
Production<sup>2</sup>  
**240 tpa**



Total LCE  
All Products<sup>2</sup>  
**7,060 tpa**



Project Life  
**14 years**

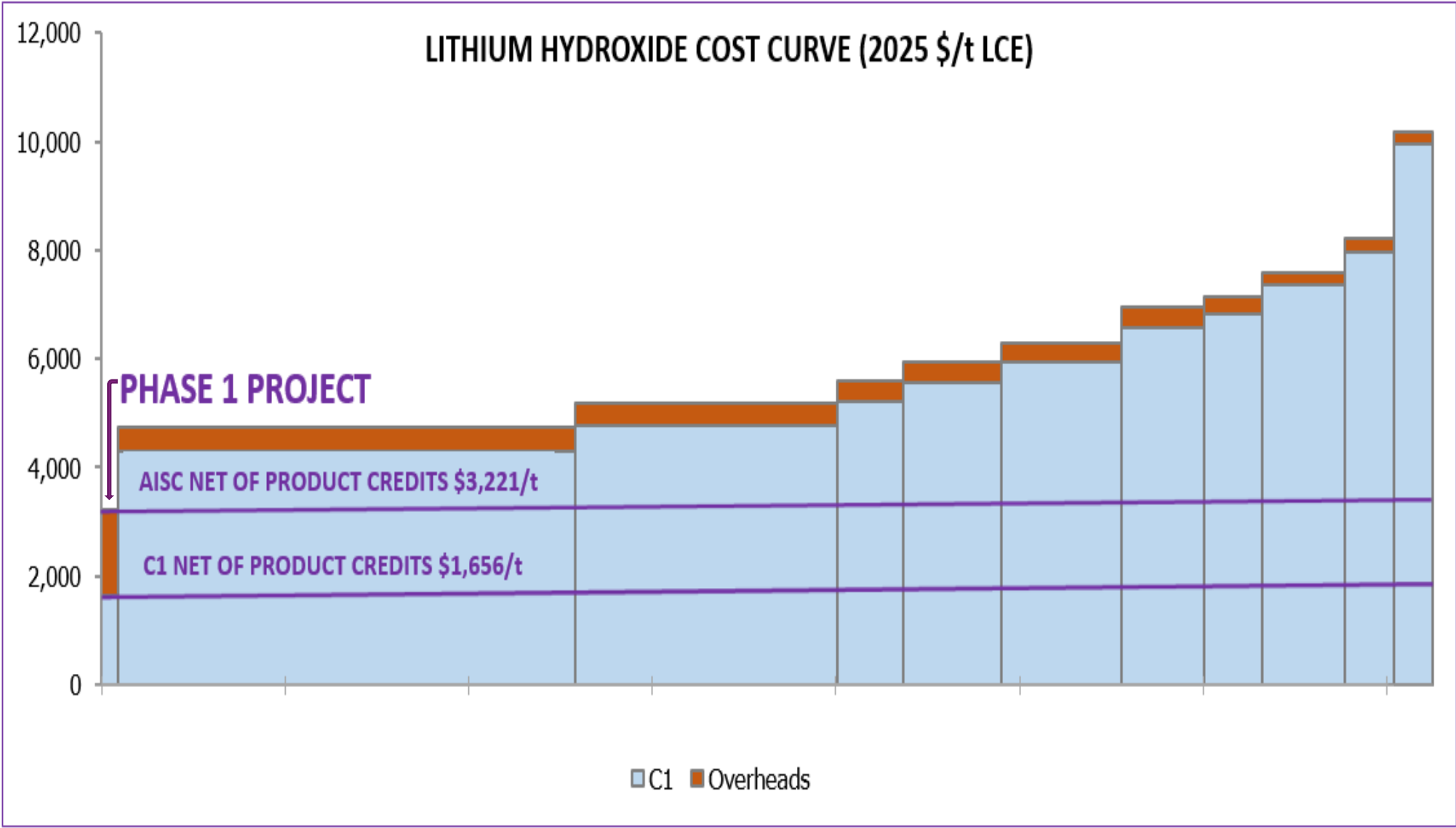
<sup>1</sup> ASX Announcement 28 May 2020: DFS delivers compelling Phase 1 Project results.

<sup>2</sup> By-products at steady state operation expressed as a salt.

<sup>3</sup> Cash flows based on Benchmark Mineral Intelligence Q1 2020 LiOH price forecast (US\$12,910/t long term).



# Low All in Sustaining Costs



Source: Benchmark Mineral Intelligence for industry data; Lepidico for Phase 1 Project data



# Finance & Offtakes

- **Lithium Hydroxide** – binding term sheets in advanced negotiation with four customers; c.80% EV supply chain, 20% agency/spot sales
- **Caesium** – binding term sheets being negotiated with multiple consumers for sulphate, hydroxide & carbonate
- **Bulk Products** – Commercial Manager, UAE appointed for local product sales
- **Testing** – samples of all products have been dispatched for customer assessment; pilot plant being run now to generate additional samples & for product development
- **Debt Finance** – formal mandate signed with the U.S. International Development Finance Corporation for Karibib; commercial lenders engaged for UAE debt; due diligence advanced; commitments targeted for late 2021-early 2022
- **Strategic Partner** – under evaluation
- **Prepayment/Streaming** – under evaluation



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# IN SUMMARY



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# TRANSITIONING TO PRODUCTION: PROGRESS POISED TO DELIVER



## Critical Minerals Confirmed

We have 6.7Mt in Reserves containing lithium, caesium, rubidium & potassium



## Feasibility Study Complete

Competitive costs and enhanced margins from by-product revenues



## Pilot Proven Technologies

Our patented L-MAX<sup>®</sup> and LOH-MAX<sup>®</sup> processes produce high quality chemicals hydro-metallurgically



## Strong ESG Credentials

CO<sub>2</sub>, water and land use intensities low, & we aim to make these best-in-class



## Strategic Collaboration

First technology licence sold to Cornish Lithium Ltd



## Experienced Management

Track record in project development, & sustainable operation



## Key Phase 1 Approvals in Place

Mining Licence, all environmental permits to construct & land lease secured



## Debt Financing

Formal mandate signed with U.S. Development Finance Corp; due diligence well advanced



## Offtake Discussions

Advanced discussions with 8 prioritised LiOH and caesium consumers



## Development Work Started May 2021

Lycopodium EPCM contractor, FEED well advanced, target construction start March 2022 quarter





Commitment to the Future

# LITHIUM MARKET



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# Push & Pull Policies Are Creating Tailwinds for Electric Vehicles...

## United States

Up to \$7,500 grants for BEV purchases  
10 states have set targets for 100% zero-emissions vehicles by 2050

## United Kingdom

£3,000 for BEVs priced <£50,000  
ICE new sales ban effective 2030

## Norway

BEVs are not subject to an import tax or the 25% VAT on motor vehicles  
ICE new sales ban effective 2025

## China

Up to ¥22,500 (~\$3,500) grant for BEVs  
Targeting 20% EV sales by 2025

## France

€7,000 grant on BEV purchases <€40,000 + €5,000 scrapping incentive  
ICE new sales ban effective 2040

## Spain

Up to €6,500 grant for BEV purchasers  
ICE sales ban effective 2040

## Germany

€9,000 grant on the purchase of BEVs priced below €40,000  
ICE new sales ban effective 2030

## Italy

€6,000 BEV purchase incentive +€4,000 if an ICE vehicle is scrapped  
Targeting 30% EV penetration by 2030

## Automotive Manufacturers Have Identified Electric Vehicle Targets



January 28, 2021 – General Motors is working with the Environmental Defense Fund to develop an **all-electric vision and eliminate tailpipe emissions from new light-duty vehicles by 2035**



July 22, 2021 – Daimler will invest **over €40 billion into battery electric vehicles** between 2022 and 2030 as they plan to go **all electric by the end of the decade**



January 7, 2021 – Volvo Cars commits to becoming a premium electric car company and, **by 2025, aims for its global sales to consist of 50% fully electric cars with the remainder being hybrids**



March 17, 2021 – BMW Group expects to deliver to customers about **2 million full-electric vehicles by the end of 2025, increasing to 10 million by 2030**



March 19, 2021 – Volkswagen announced goal of becoming **balance sheet CO<sub>2</sub> neutral by 2050**



June 2, 2021 – Toyota plans to expand to around **70 electrified models globally by 2025 and become carbon neutrality by 2050**

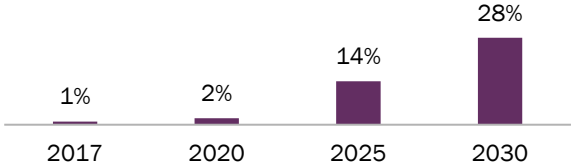


# ...Driving Significant Ramp-Up in Electric Vehicle Penetration Globally

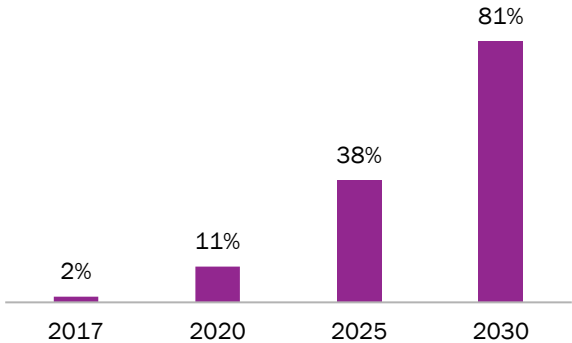
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Electric Vehicle Penetration

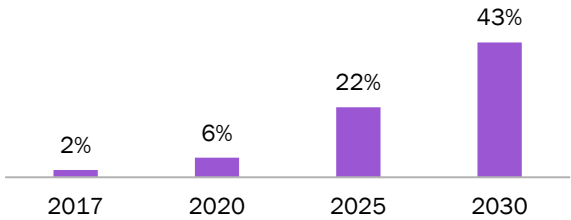
North America



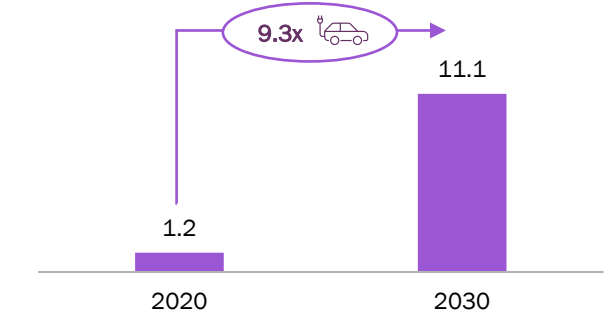
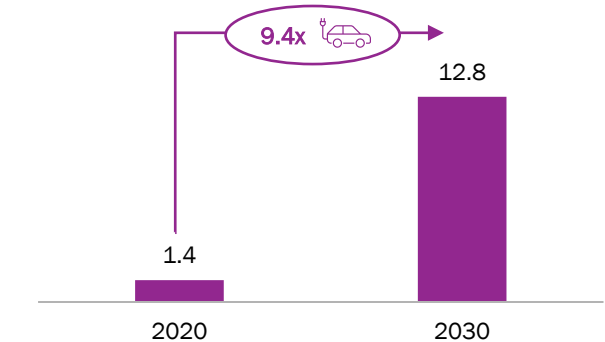
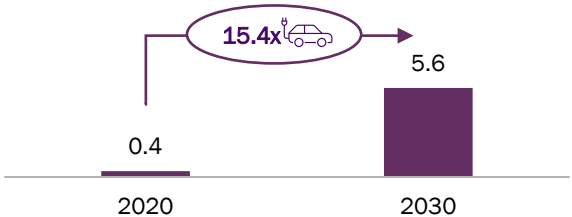
Europe



China



Electric Vehicle Sales (millions)



Secular Changes in EV Adoption Will Transform Demand for Battery Materials

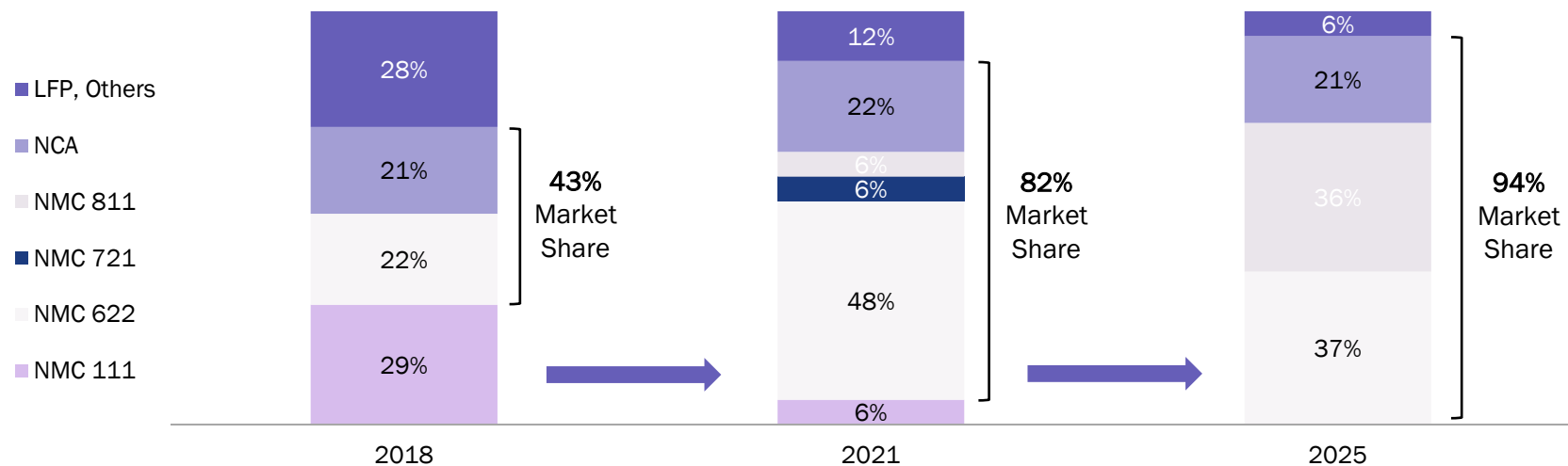
Source: Jefferies Equity Research.

# Lithium Is THE Critical Component

*Lithium Is the Constant Input Across All Types of EV Batteries*

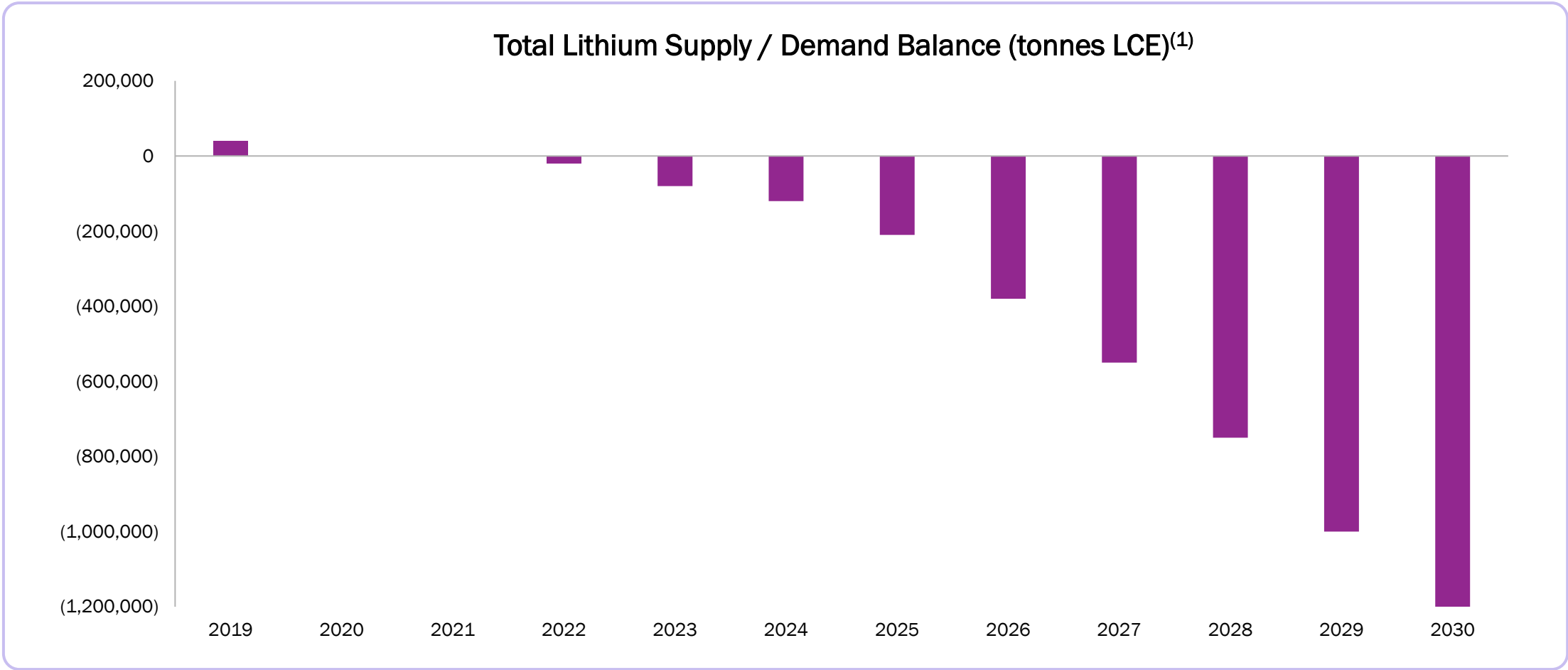
Cathode Material	Lithium	Copper	Nickel	Manganese	Cobalt	Graphite
NCA	✓	✓	✓		✓	✓
NCA+	✓	✓	✓		✓	✓
NMC 333	✓	✓	✓	✓	✓	✓
NMC 532	✓	✓	✓	✓	✓	✓
NMC 622	✓	✓	✓	✓	✓	✓
NMC 811	✓	✓	✓	✓	✓	✓
LFP	✓	✓				✓
LMO	✓	✓		✓		✓

*LiOH expected to take dominant share (90%+) in lithium battery cathode chemistries by 2025*





# Strong Fundamentals...

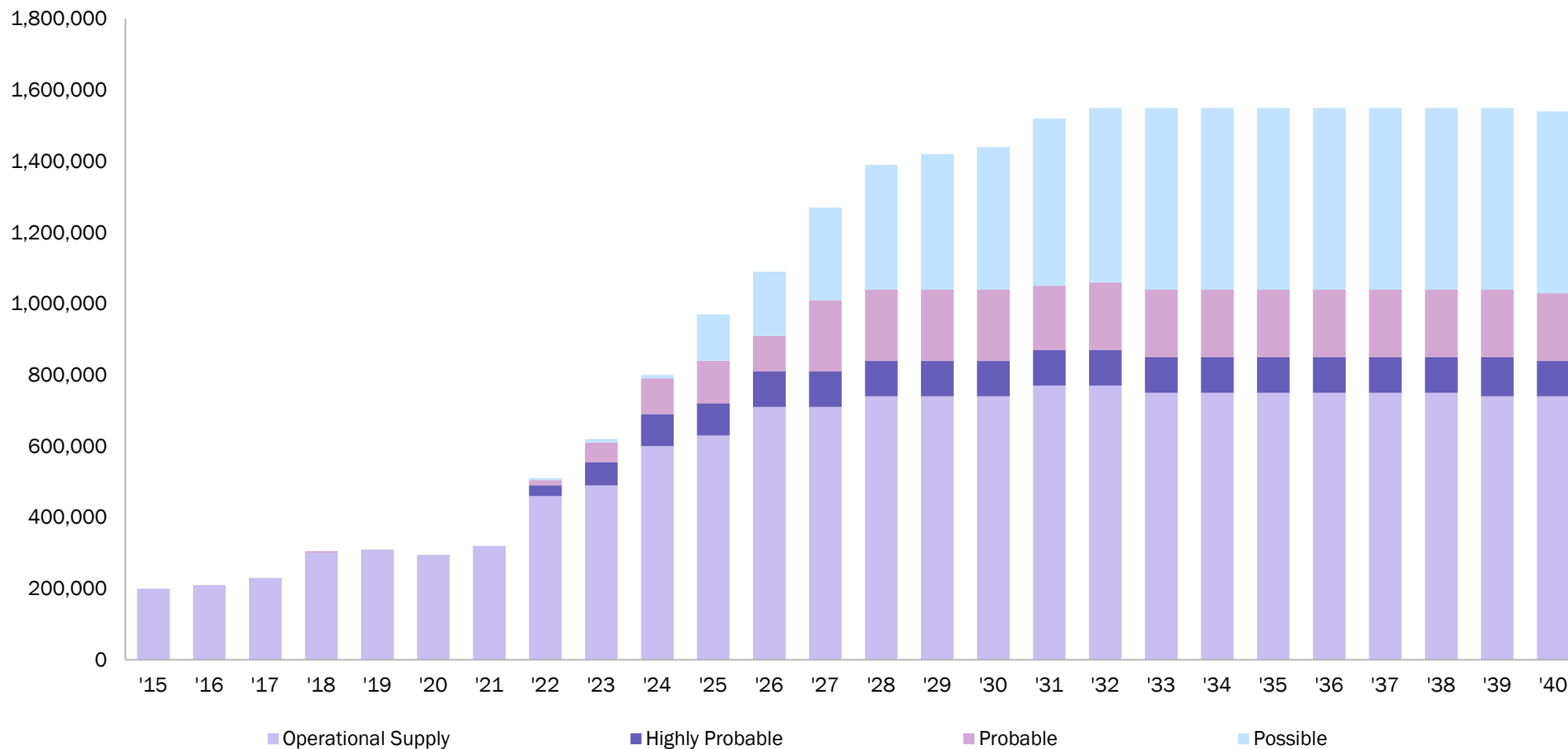


*The market for lithium chemicals is forecasted to be in a supply deficit from 2022 onwards*

(1) Source: Benchmark Mineral Index.

# ...Underpinned by Project Uncertainty and Long Lead-times

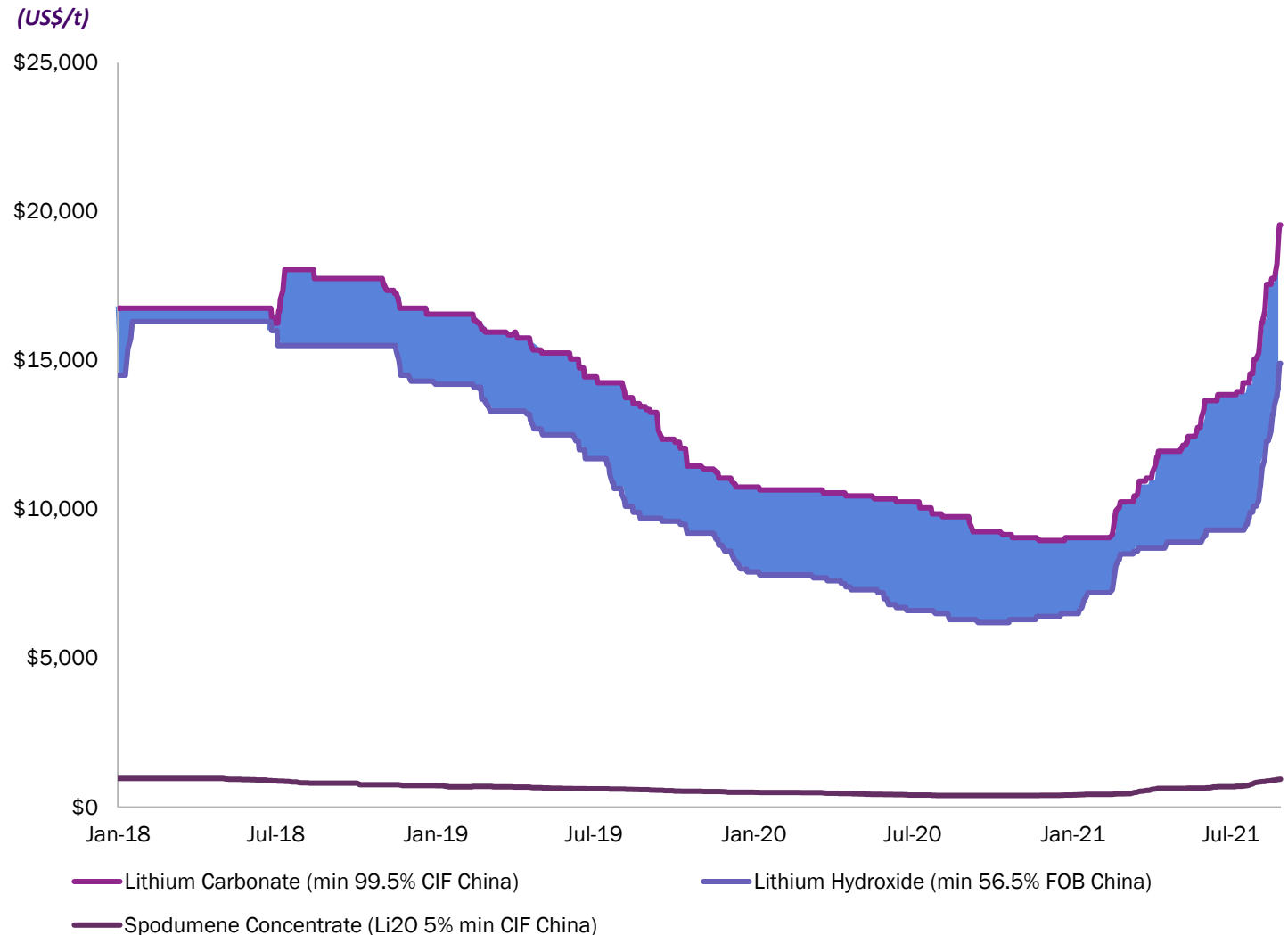
Lithium Global Supply Forecast (tonnes LCE)<sup>(1)</sup>





# Lithium Industry Pricing Mechanisms

- Since beginning of 2021, prices of both lithium hydroxide and lithium carbonate have continued to rise back to almost 2018 levels
- Primarily driven by the sharp surge in domestic Chinese lithium carbonate market
- Similarly prices for most battery raw materials were maintained at historically high levels compared to the past 2-year period
- Continued strong demand growth into H2 2021 is expected to maintain elevated prices



# Lithium Supply Chain

*Lepidico's value chain focus*

*Typical Project IRR*

EXTRACTION

CHEMICAL PROCESSING

CATHODE / ANODE  
PRODUCTION

CELL  
MANUFACTURING

APPLICATION

15% - 40%

10% - 15%

15% - 25%

10% - 20%

5% - 15%



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## IMPORTANT INFORMATION

This presentation has been prepared by the management of Lepidico Ltd (the 'Company') for the benefit of brokers, analysts and investors and not as specific advice to any particular party or person.

The information is based on publicly available information, internally developed data and other external sources. No independent verification of those sources has been undertaken and where any opinion is expressed in this document it is based on the assumptions and limitations mentioned herein and is an expression of present opinion only. No warranties or representations can be made as to the origin, validity, accuracy, completeness, currency or reliability of the information. The Company disclaims and excludes all liability (to the extent permitted by law), for losses, claims, damages, demands, costs and expenses of whatever nature arising in any way out of or in connection with the information, its accuracy, completeness or by reason of reliance by any person on any of it.

Where the Company expresses or implies an expectation or belief as to the success of future exploration and the economic viability of future projects, such expectation or belief is based on management's current predictions, assumptions and projections. However, such forecasts are subject to risks, uncertainties and other factors which could cause actual results to differ materially from future results expressed, projected or implied by such forecasts. Such risks include, but are not limited to, exploration success, commodity price volatility, future changes to mineral resource estimates, changes to assumptions for capital and operating costs as well as political and operational risks and governmental regulation outcomes. For more detail of risks and other factors, refer to the Company's other Australian Securities Exchange announcements and filings. The Company does not have any obligation to advise any person if it becomes aware of any inaccuracy in, or omission from, any forecast or to update such forecast.

## Forward-looking Statements

All statements other than statements of historical fact included in this release including, without limitation, statements regarding future plans and objectives of Lepidico, are forward-looking statements. Forward-looking statements can be identified by words such as "anticipate", "believe", "could", "estimate", "expect", "future", "intend", "may", "opportunity", "plan", "potential", "project", "seek", "will" and other similar words that involve risks and uncertainties. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions regarding future events and actions that are expected to take place. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of the Company, its directors and management of Lepidico that could cause Lepidico's actual results to differ materially from the results expressed or anticipated in these statements.

The Company cannot and does not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this release will actually occur and investors are cautioned not to place any reliance on these forward-looking statements. Lepidico does not undertake to update or revise forward-looking statements, or to publish prospective financial information in the future, regardless of whether new information, future events or any other factors affect the information contained in this release, except where required by applicable law and stock exchange listing requirements.

## Competent Person Statement

The information in this report that relates to the Helikon 1 and Rubicon Ore Reserve estimates is extracted from an ASX Announcement dated 28 May 2020 ("Definitive Feasibility Study Delivers Compelling Phase 1 Project Results") and was completed in accordance with the guidelines of the JORC Code (2012). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resource estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original market announcement.

The information in this report that relates to the Rubicon and Helikon 1 Mineral Resource estimates is extracted from ASX Announcements dated 30 January 2020 ("Updated Mineral Resource Estimates for Helikon 1 and Rubicon") and 12 March 2021 ("Karibib Mineral Resource expanded"), which completed in accordance with the guidelines of the JORC Code (2012). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resource estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original market announcement.

The information in this report that relates to the Helikon 2 - Helikon 5 Mineral Resource estimates is extracted from an ASX Announcement dated 16 July 2019 ("Drilling Starts at the Karibib Lithium Project") and was completed in accordance with the guidelines of the JORC Code (2012). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions and technical parameters underpinning the Mineral Resource estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are represented have not been materially modified from the original market announcement.





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**Creative Resources Leadership**

Website: [www.lepidico.com](http://www.lepidico.com)

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