

# Lepidico

DFS results analysis

## Valuation update post-feasibility study

On 28 May, Lepidico (LPD) announced the results of its definitive feasibility study (DFS) on its integrated Karibib mining/chemical plant project to produce 4,900t of battery-grade lithium hydroxide (monohydrate) per annum plus a suite of high-value, Group 1 metal by-products over 14 years. The DFS calculated a project NPV<sub>8</sub> of US\$221m and an IRR of 31% after initial capex of US\$139m (including a 13% contingency). C1 cash costs were estimated at US\$1,656/t lithium carbonate equivalent (LCE) and all-in sustaining costs at US\$3,221/t LCE – putting it near the bottom of the known global lithium chemical cost curve. This report updates our valuation of the company in the light of the DFS results.

Year end	Total revenues (A\$m)	PBT (A\$m)	Cash from operations (A\$m)	Net cash/(debt)* (A\$m)	Capex (A\$m)
06/18	0.2	(7.2)	(3.0)	4.9	(3.1)
06/19	0.0	(5.1)	(3.5)	10.4	(6.3)
06/20e	0.0	(8.4)	(10.3)	(3.5)	(7.4)
06/21e	0.0	(3.7)	(4.3)	51.4	(1.4)

Note: \*Includes Desert Lion Energy convertible.

### Immediate 2.6x upside potential

In our report, [Gold stars and black holes](#), published in January 2019, we calculated a mean EV for companies with projects at a DFS stage of development at 30.9% of project NPV (ranging up to 133.5%), which would imply an immediate valuation of Lepidico of 1.8c/share (ranging up to 8.2c/share) including cash/(debt).

### Valuation: 4.82cps plus expansion/extension options

The Karibib project is already fully permitted under a granted mining licence and its development has been materially de-risked by Lepidico's earlier running of a pilot plant campaign. Within this context, LPD is currently investigating funding and offtake options prior to making a final investment decision targeted for May 2021. Based on the advice of specialist debt advisors, it is aiming for a debt:equity ratio in the range 60–70:40–30. We calculate that 40% equity funding would require the company to raise c A\$60.5m. Conducted at an assumed equity price of 2.9cps, we estimate that this would result in a 'base case' valuation for Lepidico of 4.82cps, or 4.15cps if equity is raised at 1.8cps (see Exhibit 18 on page 15 for sensitivities). These valuations compare with our previous estimated valuations of 5.2cps with equity raised at 2.9cps or 4.5cps with equity raised at 2.0cps (see [Developing to the \(L-\)Max](#), published on 29 May 2020). In contrast to our earlier valuations, however, the updated ones account for likely tax payable in Namibia and a minority charge relating to Lepidico's ownership of 80% of the Namibian mining operation. Note that this valuation does not attribute any value to Lepidico either from the supply of the Abu Dhabi chemical plant from another source such as Alvarrões (potentially worth up to 1.59cps, according to our calculations, if on substantially the same terms as Namibia) or from a 20,000tpa Phase 2 plant or any other development options (eg third-party technology licensing and/or gold exploration).

## Metals & mining

20 July 2020

**Price** **A\$0.007**
**Market cap** **A\$36m**

A\$1.4545/US\$

Net debt\* (A\$m) at end December 2019 1.8

\*Includes Desert Lion Energy convertible

Shares in issue (post rights issue) 5,185.7m

Free float 78%

Code LPD

Primary exchange ASX

Secondary exchange N/A

### Share price performance



% 1m 3m 12m

Abs (12.5) (40.9) (70.5)

Rel (local) (13.0) (46.7) (67.5)

52-week high/low A\$0.03 A\$0.01

### Business description

Via its Karibib project in Namibia and unique IP, Lepidico is a vertically integrated lithium development business that has produced both lithium carbonate and lithium hydroxide from non-traditional hard rock lithium-bearing minerals using its registered L-Max<sup>®</sup> and LOH-Max<sup>™</sup> processes.

### Next events

Final investment decision May 2021

Karibib site works commence September 2021

Chemical plant commissioning February 2023

Project fully operational June 2023

### Analyst

Charles Gibson +44 (0)20 3077 5724

[mining@edisongroup.com](mailto:mining@edisongroup.com)
[Edison profile page](#)

**Lepidico is a research client of  
Edison Investment Research  
Limited**

## Investment summary

---

### Company description

Lepidico is an ASX-listed lithium exploration and development company that provides exposure to quality lepidolite ore reserves and a prospective lithium exploration asset package in Namibia along with ownership of a number of unique lithium processing technologies that include L-Max and LOH-Max. The L-Max and LOH-Max processes are disruptive technologies that present the opportunity to create a competitive third source of lithium supply (in addition to brines and spodumene), namely lithium-bearing micas such as lepidolite and zinnwaldite and lithium phosphate minerals including amblygonite. Although a number of lithium-bearing mica deposits are known around the world, these minerals have typically been overlooked as a source of lithium as there has been no commercial, energy efficient hydrometallurgical process by which to exploit them economically to produce lithium chemicals. Lepidico's strategic objective is to become a sustainable lithium hydroxide producer over the next two years as it brings its Karibib mine in Namibia into production in parallel with an L-Max/LOH-Max chemical plant in Abu Dhabi.

### Valuation

At a future assumed equity raising price of 2.9c per share, our valuation of Lepidico is 4.82c per share, based on the value of (maximum potential) future dividends payable to shareholders discounted back to the present at our customary rate of 10% pa. To this should then be added the value of Lepidico's inter-company loan for the minority holding in the Namibian mining and concentrating operation, which we estimate to be 0.27c, to result in a total value for Lepidico of 4.82c. While 2.9c per share is some way above the current share price, Lepidico's shares have been sold down heavily since late January, not only because of weak sentiment surrounding lithium developers, but also on account of the effect of the coronavirus on world markets generally. Now that Lepidico's feasibility study has been completed, coronavirus concerns are abating and in the expectation that sentiment towards lithium developers will improve, it is not unreasonable to assume that Lepidico's share price could recover to 1.8c and perhaps to as much as 8.2c (see pages 13 and 1). In this case, 2.9c is also the average price of Lepidico's shares between early November 2017 and late February 2020. It is also the price at which Lepidico announced its last significant equity fund-raising in the form of a one-for-nine entitlement offer, in early May 2019, to raise A\$10.8m. Beyond this scenario, management is unlikely to commit to the equity dilution inherent in developing the project at prices much below 2.9c per share.

### Sensitivities

An analysis of the sensitivity of our valuation to the price at which future equity funding is conducted is provided in Exhibit 18 on page 15 of this report. Otherwise, we estimate that each  $\pm$ US\$2,000/t change in the lithium hydroxide price results in a  $\pm$ 1.18c change to our 'base case' valuation, while each  $\pm$ 10% change in the rubidium sulphate price changes it by  $\pm$ 0.24c/share. Perhaps most significantly, we estimate that extending the life of the operation by 10 years by supplying lepidolite concentrate from either the conversion of mineral resources to ore reserves and/or expanding the resource base in Namibia or securing feed from another deposit such as Alvarrões or Separation Rapids to its chemical plant in Abu Dhabi potentially adds as much as 1.59c/share to our valuation to take the total to 6.41c/share.

### Financials

According to its quarterly activities report for Q320, Lepidico had A\$2.9m in cash and cash equivalents at end March, since which time it has closed a one-for-nine entitlement offer (effectively

a rights issue) to raise A\$3.86m via the issue of a total of 552.1m shares plus 276.0m options (including over-subscriptions) at a price of 0.7c per share.

## DFS results

This report should be read in conjunction with Lepidico's DFS [results announcement](#), released on 28 May, our last two reports on Lepidico (see [Developing to the \(L-\)Max](#) and [Valuation update pending feasibility study](#), published on 6 April 2020) and Lepidico's [latest corporate presentation](#).

## Introduction

On 28 May, Lepidico announced the results of its definitive feasibility study on its integrated Karibib mining/chemical plant project to produce 4,900tpa of battery-grade lithium hydroxide (monohydrate) plus high-value, Group 1 metal by-products over 14 years. At an average life of project lithium hydroxide price of US\$13,669/t (Benchmark Minerals, BMI, forecast) and a long-term price of US\$12,910/t, the DFS calculated a project NPV<sub>8</sub> of US\$221m, or A\$340m (A\$0.066/share) and an IRR of 31% after initial capex of US\$139m (including a 13% contingency – Association of the Advancement of Cost Engineering [AACE] class three estimate). C1 cash costs were estimated to a ±15% level of accuracy at US\$1,656/t lithium carbonate equivalent (LCE) and all-in sustaining costs at US\$3,221/t LCE – putting it near the bottom of the known LiOH cost curve. Among other things, Lepidico's DFS provided the first confirmation that it is the company's definite intention to locate its lithium hydroxide chemical plant in Abu Dhabi rather than elsewhere.

As an exercise in value creation, the results of Lepidico's DFS may be compared with those of Karibib's former operator, Desert Lion (taken over by Lepidico in July 2019). Desert Lion published the results of a preliminary economic assessment (PEA) on Karibib on 1 November 2018 (ie one and a half years ago). Although Desert Lion was investigating a conventional mining and concentration operation at the mine site in parallel with the operation of a chemical conversion plant using roasting technology at Walvis Bay to produce lithium carbonate (cf Lepidico producing lithium hydroxide in Abu Dhabi), a comparison between the results of the two studies is nevertheless instructive:

**Exhibit 1: Lepidico DFS results vs Desert Lion Karibib PEA**

Item	Desert Lion PEA (Nov 2018)	Lepidico DFS (May 2020)	Increase (%)
Initial capex	US\$275m	US\$139m plus US\$5.5m leases plus US\$16.0m working capital	-49.5
Production	20,000tpa lithium carbonate	4,900tpa lithium hydroxide plus by-products	
NPV <sub>8</sub>	US\$109m at US\$13,000/t lithium carbonate price	US\$221m at US\$13,669/t lithium hydroxide price	+102.8
IRR (%)	29%	31%	+2 percentage points

Source: Desert Lion Energy, Lepidico, Edison Investment Research

## Reserves

Included in Lepidico's DFS is a maiden reserve statement for the Karibib mining operation in Namibia, which allows us to perform a resource conversion calculation, as follows:

**Exhibit 2: Karibib resources and reserves (Rubicon 1 plus Helikon 1 pits)**

Resource category	Resource			Reserve category	Reserve			Resource to reserve conversion (%)		
	Tonnage (kt)	Grade (% Li <sub>2</sub> O)	Contained Li <sub>2</sub> O (t)		Tonnage (kt)	Grade (% Li <sub>2</sub> O)	Contained Li <sub>2</sub> O (t)	Tonnage	Grade	Contained Li <sub>2</sub> O
Measured	2,200	0.57	12,428	Proved	1,930	0.59	11,385	87.7	102.6	91.6
Indicated	6,660	0.38	25,292	Probable	4,790	0.41	19,307	71.9	106.1	76.3
Inferred	170	0.70	1,190	Possible	0	0.00	0	0.0	0.0	0.0
<b>Total</b>	<b>9,040</b>	<b>0.43</b>	<b>38,910</b>	<b>Total</b>	<b>6,720</b>	<b>0.46</b>	<b>30,692</b>	<b>74.3</b>	<b>106.1</b>	<b>78.9</b>

Source: Lepidico, Edison Investment Research. Note: 0.15% cut-off grade applied to resources.

Resource to reserve conversion ratios are similarly high for Karibib's principal by-products metals (namely caesium, rubidium and potassium), ranging from 97.1–108.7% in terms of (average) grade and 72.2–74.8% in terms of (total) contained metal.

In addition to its economic benefits, Lepidico's environmental and social impact assessments point to the following ESG advantages at both its mining operation at Karibib and its lepidolite chemical conversion plant in Abu Dhabi:

### **Karibib lithium mining project**

- Brownfield site – redevelopments designed largely within the footprints of former mining activities.
- Sustainable closure – industry best practice closure plans that will rectify mining and processing legacy issues.
- Social benefits – creation of 115 jobs to benefit local communities and no relocation requirement.
- Renewable energy – utility objective to have 80% of power generated from renewable sources by 2025.
- No tailings storage facility – co-disposal of benign dry stacked flotation plant tails with mine waste.
- Small scale mining fleet – electric option will be reviewed as right-sized equipment becomes available.
- Water sourced locally from the ground with >85% of process water recycled – resulting in low water consumption intensity.

### **Lepidolite chemical conversion plant**

- Relatively modest power consumption; gas fired electrical power to be supplemented by future solar projects.
- Heat recovery equipment included in design to reduce gas consumption.
- Low emissions with net carbon intensity for integrated project of 5-7t CO<sub>2</sub>/t LiOH.H<sub>2</sub>O after amorphous silica credit, with potential for further improvements from identified opportunities.
- SOP, caesium and rubidium by-products to provide further carbon credits (to be quantified).
- Residue product could generate additional carbon credits and result in a zero-waste facility.
- Social benefits – creation of 119 jobs and low impact as built on existing industrial park.
- Small footprint minimises steel and concrete in construction.
- Acts as an enabler for downstream development of a lithium-ion battery industry in the UAE.

## **DFS results vs updated and our historic assumptions**

---

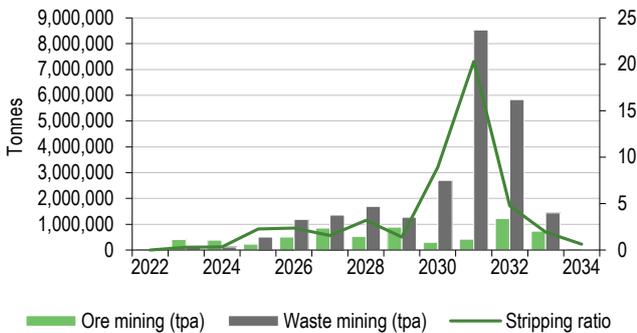
For the purposes of this section, the integrated project, on which the DFS was completed, has been subdivided into its constituent functional and commercial parts, namely a mining and concentration operation at Karibib in Namibia and a chemical plant in Abu Dhabi. Each is considered in turn, below.

### **Karibib mining and concentration**

Our previous estimates of the mining operation at Karibib were largely drawn by applying parameters outlined in Desert Lion's 2018 Karibib PEA. In summary, we envisaged the mining operation producing 0.6Mtpa at a strip ratio of 5.42 to produce 58kt of concentrate pa at an average grade of 4.06% lithium oxide. By contrast, Lepidico's DFS includes much more detail on the mining

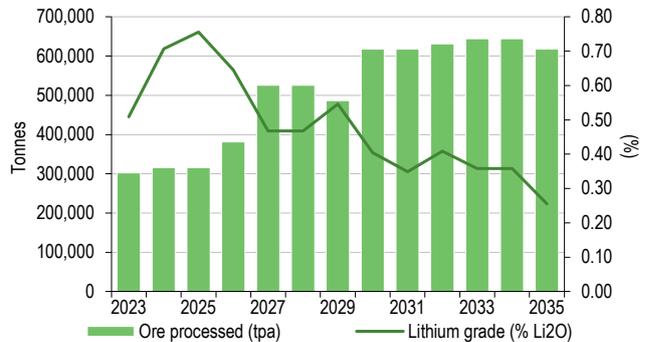
operation and envisages mining c 0.5Mt ore pa at a strip ratio of 3.8 in order to produce c 60kt of concentrate pa at an average grade of 3.23% lithium oxide after a (lithium) recovery to concentrate of 80.6% with the ore reserve optimised for the recovery of both lithium and caesium. Graphical representations of the details of the anticipated mining and processing operations at Karibib are provided in Exhibits 3 and 4 below.

**Exhibit 3: Karibib ore and waste mining at Karibib by calendar year**



Source: Lepidico, Edison Investment Research. Note: Calendar years.

**Exhibit 4: Karibib ore processing by calendar year (tonnes and grade)**



Source: Lepidico, Edison Investment Research. Note: Calendar years.

The concentrator will operate at a throughput rate of c 320ktpa (vs a design specification of 333ktpa) with lithium recovery to concentrate of close to 90% for the first four years of the life of the project. As mined grades decline, throughput will be increased to 514ktpa (vs a design specification of 541ktpa) for the next three years via the addition of a second (albeit smaller) ball mill to the process circuit. Finally, in order to maintain a constant rate of concentrate production once the high grade LEP-B zone has been depleted (see [Valuation update pending feasibility study](#)), bulk mining of lithium-muscovite from year nine onwards will necessitate both an increase in waste mining (and therefore the stripping ratio) as well as concentrator throughput, which will be raised to 637ktpa for the remaining six years of the life of the operation (Exhibit 4).

Unless otherwise indicated, we have adopted the values and parameters indicated in Lepidico's DFS as the basis of our own financial model, from which our own valuation is subsequently derived (see Valuation section on pages 13–14).

A comparison of unit cost estimates for the Karibib mining and concentration operation derived from Lepidico's feasibility study with those previously adopted by Edison (based largely on Desert Lion's PEA) is provided in the table below:

**Exhibit 5: Edison assumptions regarding Namibian lithium project mine and concentrator**

Item	Updated assumption	Previous assumption
<b>Mining operation</b>		
Stripping ratio	3.77	5.42
Variable mining costs	N/A	US\$2.63/t moved
Fixed costs	N/A	US\$0.74m pa
Total mining costs	US\$30.90/t	US\$15.51/t ore
<b>Concentrator</b>		
Concentrator opex	US\$121/dmt lepidolite concentrate	US\$136.47 per dry metric tonne lepidolite concentrate produced
Transport costs (mine-Walvis Bay)	US\$46.70/dmt lepidolite concentrate	US\$17.70 per dry metric tonne lepidolite concentrate
Freight costs (Walvis Bay-Abu Dhabi)	US\$72.70/dmt lepidolite concentrate	US\$27.48 per dry metric tonne lepidolite concentrate
<b>Capex</b>		
Mining capex	US\$11.1m	US\$3.8m
Concentrator	US\$26.8m	US\$13.8m
Tailings (included in concentrator capex)	N/A	US\$1.9m
Initial mining capex total	US\$37.9m*	US\$17.6m*
Sustaining and closure costs	US\$14.2m	US\$28.2m
Total life of mine capex	US\$52.1m	US\$45.8m

Source: Lepidico, Edison Investment Research, Desert Lion NI 43-101 technical report. Note: \*Before contingency.

Readers should note that the updated estimate of US\$37.9m for initial mine and concentrator capital expenditure includes US\$5.5m in capitalised fleet lease costs, which are also included in the updated US\$30.90/t estimate of total mining costs. Sustaining capital similarly includes US\$5.0m in capitalised lease costs in relation to the installation of a second ball mill to the processing line in 2029, which are also included in total mining costs.

While there is inevitably some variation between our previous and updated estimates for the mining and concentration operation at Karibib, we estimate that, at the updated parameters, Lepidico will be able to produce lepidolite concentrate at an average C1 cost of US\$310.20/t (Free On Board [FOB] Walvis Bay) and an average AISC of US\$321.99/t over the life of the mine, which compares with a C1 cost estimate of US\$315/t in Lepidico's DFS and our previously derived estimate of US\$343.07/t.

As previously – and for tax and minority interest accounting purposes (see page 7) – we are continuing to assume that the Karibib project will effectively 'sell' its concentrate to the Phase 1 plant in Abu Dhabi at a price of US\$385/t (based on a lithium hydroxide price of US\$14,021/t – see below), to generate an average c 16% net margin after sustaining capital (but excluding initial capital) for the mining and concentration operation. In part, this is based on an extrapolation of the commercial terms implied by the previous agreement between Desert Lion and Jinhui for the concentration and export of existing surface stockpiles at Karibib to Jinhui's roaster-based conversion plant in China (see below). It is also consistent with our earlier estimate of the likely free market price of a lithium-mica concentrate, calculated with reference to known lithium-spodumene concentrate prices, adjusted pro rata to the grade of the concentrates.

### Concentrate pricing and the Desert Lion-Jinhui precedent

On 6 March 2018, Desert Lion announced that it had entered into a binding offtake agreement with Chinese lepidolite converter Jiangxi Jinhui Lithium, whereby it would sell lithium concentrate from Phase 1 production of stockpiled material located at Karibib to Jinhui. Under the terms of the agreement, Jinhui agreed to purchase all lithium concentrate produced from the stockpiled material that contains not less than 2.0% lithium oxide (Li<sub>2</sub>O) and up to a maximum of 120,000t of lithium concentrate containing not less than 1.7% Li<sub>2</sub>O. At the time, Desert Lion management estimated that there were approximately 700–750kt of stockpiled material located at Karibib, capable of producing c 150–160kt of lithium concentrate for sale to Jinhui over the following 12–18 months. Payment by Jinhui for each shipment of lithium concentrate, each in an approximate amount of

30kt, was to be collateralised by the delivery by Jinhui to Desert Lion of irrevocable and unconditional letters of credit drawable on a major international bank. On execution of the agreement, Jinhui made a deposit of US\$4.5m against future delivery of lepidolite concentrate, which would then deplete by an adjustment to the purchase price using a depletion factor of US\$40.00 per tonne. The purchase price for lithium concentrate was to be determined as of the first day of each month, for that month, calculated as a percentage of the previous 30-day moving average price of 99.5% lithium carbonate as published by Asian Metals. The percentage of the benchmark was determined by the average lithium oxide and tantalum content of the concentrate.

While Desert Lion's announcement of 6 March was relatively guarded in terms of expressing the detailed commercial terms of the relationship between itself and Jinhui, in the event it made only one shipment of concentrate to Jinhui, which was completed on 24 April 2018. At the time of its first shipment, it had expected to deliver an additional 60,000t of lithium concentrate from its sorting operations by the end of Q318, ahead of an anticipated start of production from a flotation plant in Q418. However, Desert Lion then ceased all operations in Namibia on 31 August, while it conducted a strategic review of its activities. In its subsequent Q218 and Q318 results, however, it made the following comments in the notes to its financial statements, 'On April 24, 2018, the Company completed its first shipment within the timeframe of the contract. As a result, the Deposit is no longer refundable and the remaining balance shall continue to amortise against future shipments. On April 24, 2018, 30,321 tonnes of lithium was shipped to Jinhui and the deposit owing was reduced by \$1,550,139 (US\$1,212,845). After assaying the product in China, the Company and Jinhui agreed on a \$1,630,849 (US\$1,275,995) grade adjustment credit note. The net realised shipment value was \$2,151,790 (US\$1,655,223).' From this, the following (per tonne) commercial parameters may be inferred:

<b>Exhibit 6: Implied Desert Lion-Jinhui lepidolite concentrate commercial terms</b>		
<b>Item</b>	<b>Sum (US\$)</b>	<b>Per tonne value (US\$/t)</b>
Deposit reduction	1,212,845	40.00
Grade adjustment credit note	1,275,995	42.08
<b>Subtotal</b>	<b>2,488,840</b>	<b>82.08</b>
Net realised value	1,655,223	54.59
Implied combined concentration and transport costs	833,617	27.49

Source: Desert Lion Energy, Edison Investment Research

While Lepidico's development of Karibib is not directly comparable to Desert Lion's, in that it will undertake a full mining and concentration operation – as opposed to Desert Lion, which was merely concentrating existing surface stockpiles – the calculation in Exhibit 6, above, nevertheless provides a valid indication, within recent history, both of an acceptable margin (ie US\$54.59/t) that an operator was prepared to earn on sales of lepidolite concentrate at Walvis Bay and an acceptable margin that a buyer was prepared to pay. Applying this to our updated estimate of US\$310.20/t for the C1 cost of delivering concentrate to Walvis Bay on a free on board (FOB) basis would suggest that an acceptable arm's length sales price between Lepidico's Karibib mining project and its Abu Dhabi chemical plant would be in the order of US\$364.79/t concentrate (note that Asian Metals spot lithium carbonate price for April 2018 was reported to be c US\$23,000/t), making allowance for Lepidico shipping a higher grade 3.2% Li<sub>2</sub>O product at a lower LCE price).

For the purposes of our financial analysis, however, we have assumed that the mining and concentrating operation will continue to sell concentrate to the Phase 1 plant at US\$385/t (FOB) and that the resulting 'profit' generated from this 16.4% net margin after sustaining capital (but excluding initial capex) will be taxable in Namibia at a rate of 37.5%. Lepidico owns 80% of the project, giving rise to a 20% minority interest in the net profit earned under a carried interest arrangement (see below).

## Karibib minority interest

Desert Lion's (and hence Lepidico's) interest in the Karibib project was 80%. The minority partners in the project are five individuals who hold their interest through a Namibian-incorporated entity and are 'carried' in terms of the development of the project but not 'free carried'. That is to say, Lepidico will organise and raise the finance (debt and equity) for the development of the project, which it will extend to the subsidiary via an inter-company loan that we have assumed will be at Lepidico's weighted average cost of capital and repaid from profits. Until further details are known, this is a relatively conservative treatment of the commercial terms of the inter-company loan for the purposes of valuing Lepidico.

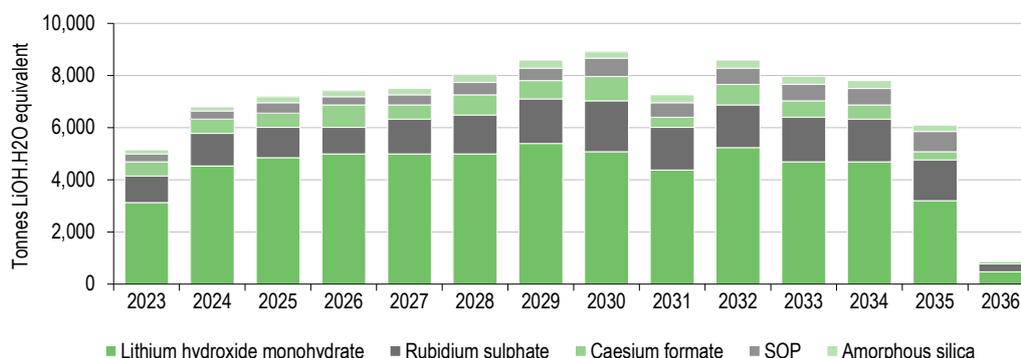
## Abu Dhabi chemical plant

Lepidico's DFS is the first technical document to specifically reflect locating a chemical plant in KIZAD (the Khalifa Industrial Zone Abu Dhabi) and to be assessed accordingly.

Other specific operating advantages for Lepidico of locating its Phase 1 plant project in KIZAD include the following:

- Sulphuric acid can initially be imported via Khalifa port and later manufactured locally in a dedicated acid plant using locally sourced sulphur.
- KIZAD land rents and labour rates are competitive.
- There is no corporate tax within the industrial free zone.
- Concentrate from Namibia will be imported via the port of Khalifa, thereby minimising logistics' costs.
- KIZAD offers world-class, established infrastructure, including power, gas, water, developed roads, storage and logistics hubs that have easy access to multiple ports and airports.
- KIZAD is capable of supplying all of the consumables and services (eg gas and labour) that Lepidico's Phase 1 plant would require at competitive cost. Among other things, for example, Lepidico has identified local sources of limestone and lime (also key reagents for L-Max/LOH-Max).
- KIZAD itself, and other nearby industrial parks, provide ready markets for a number of L-Max, LOH-Max and S-Max™ products (eg amorphous silica to the cement industry situated there).
- KIZAD has adopted a 'plug and play' approach towards new industrial developments; an environmental baseline study has therefore already been conducted for the site in question, and the approvals and permitting process is expected to be completed within six months.
- A number of key Lepidico personnel, including the managing director, Joe Walsh, have worked in Abu Dhabi in the past and have already developed good working relationships there.

The initial design specifications of the chemical plant will be a throughput rate of 56,700t concentrate (dry) pa, capable of producing 5,600tpa lithium hydroxide monohydrate (at a concentrate grade of 4% lithium oxide). However, the plant will be progressively de-bottlenecked such that, from year five of the project, the target throughput rate will be 66,577tpa concentrate to result in ongoing lithium hydroxide production that is within 11% of 4,900pa plus a range of by-products that take the total to c 7,800t lithium hydroxide equivalent per annum. This is less than our previous estimate, as the project has now been optimised for production of both lithium and caesium, resulting in the average lithium concentrate grade being lower. Previously, we had assumed annual production of c 5,000t lithium carbonate equivalent pa, or 5,679tpa lithium hydroxide from 58,000tpa of concentrate processed).

**Exhibit 7: Lepidico chemical plant forecast production (tonnes lithium hydroxide monohydrate equivalent per annum)**


Source: Lepidico, Edison Investment Research. Note: Calendar years.

Compared with our previous estimates, the costs of operating the chemical plant in Abu Dhabi (and also our updated estimates) according to Lepidico's DFS are as follows:

**Exhibit 8: Integrated mine and chemical plant unit operating costs (US\$/t concentrate processed)**

Item	Updated	Previous
Concentrate production cost (FOB Walvis Bay)*	310.20	343.07
Concentrate purchase price	385.00	385.00
Concentrate transport	72.20	4.44
Chemical plant and other	440.20	445.72
General and administrative	34.10	81.30
<b>Total unit costs</b>	<b>856.70</b>	<b>874.53</b>

Source: Lepidico, Edison Investment Research. Note: \*See page 5; totals may not add up owing to rounding.

Note that the estimated US\$440.20/t concentrate includes a US\$35.60/t cost relating to a technology royalty (2.0% of the concentrate value) payable to Lepidico, which is relevant to the DFS's calculation of the project's NPV, but is irrelevant to our valuation of the company as the cost to the project is offset by an equal and opposite revenue to the company, which is earned at a zero rate of corporate income tax in Abu Dhabi.

As noted earlier, the previous estimate of a lithium-mica concentrate purchase price of US\$385/t was based on a forecast spodumene concentrate price of US\$550/t (source: Roskill), adjusted for the lower grade of the lepidolite concentrate (then forecast at c 4.5% Li<sub>2</sub>O vs 6% for a typical spodumene concentrate – albeit with no account taken at the time of by-product value which, in reality, will be over 30% of life of mine revenue, see Exhibit 7 for balance of by-products vs lithium production). It compared with quotes solicited at the time to deliver lepidolite concentrate to Kenora from an existing European mine, which were found to be below the US\$350/t used in Lepidico's earlier Phase 1 plant project PFS (including transport).

## Capex

Lepidico's DFS calculated initial capex for the chemical plant as shown in Exhibit 9, which is within 7% of our previous estimate, despite the latter being no more than a scaled-up version of Lepidico's PFS parameters (albeit they were prepared in consultation with an independent cost-estimating firm – Professional Cost Consultants – and based on a comprehensive equipment list, with pricing obtained from up to three vendors):

**Exhibit 9: Chemical plant capex estimate (US\$m)**

Item	May 2020 (DFS)		April 2020 (Edison)	
	Estimate (US\$m)	Percent of total (%)	Estimate (US\$m)	Percent of total (%)
Chemical plant direct costs	64.8	76.1	47.6	63.1
EPCM/L-Max plant services	10.4	12.2	21.1	28.0
Owner's/Indirect costs	7.2	8.5	6.7	8.9
Support buildings etc	2.7	3.2	N/A	0.0
<b>Subtotal</b>	<b>85.1</b>	<b>100.0</b>	<b>75.4</b>	<b>100.0</b>
Contingency	11.1	13.0	15.1	20.0
<b>Total</b>	<b>96.2</b>	<b>113.0</b>	<b>90.5</b>	<b>120.0</b>

Source: Lepidico, Edison Investment Research.

Sustaining capex at the chemical plant is estimated to be US\$28.0m over the 13-year life of the plant, although this sum includes US\$15.6m relating to the installation of an acid plant in 2024 which, in reality, will be leased, the costs of which are also included in the DFS's estimate of operating costs (see Exhibit 8). Net of this cost, sustaining capex is estimated to be US\$12.4m over 13 years, compared with our previous estimate of US\$1.9m pa, which was largely attributable to residue disposal.

Note that DFS cost estimates are made to an accuracy of  $\pm 15\%$  compared with a  $-20\%$  to  $+30\%$  for Lepidico's earlier Phase 1 plant project PFS.

## Prices and other assumptions

A comparison of the prices used in Lepidico's DFS compared with both our previous long-term price forecasts and our updated price forecasts is provided in the table below.

**Exhibit 10: Product and by-product price assumptions**

Product	DFS price (US\$/t unless otherwise indicated)	Updated Edison forecast	Previous Edison forecast
Lithium hydroxide	US\$13,669/t & US\$12,910/t long term	US\$14,021/t	US\$14,021/t
Sulphate of potash (SOP)	US\$540/t	US\$540/t	US\$600/t
Caesium formate	US\$42,900/t	US\$42,900/t	US\$37,000/t
Rubidium sulphate	US\$13,600/t	US\$13,135/t	N/A
Amorphous silica	US\$100/t	US\$100/t	N/A
Gypsum	US\$4/t	N/A	US\$10/t

Source: Lepidico, Edison Investment Research.

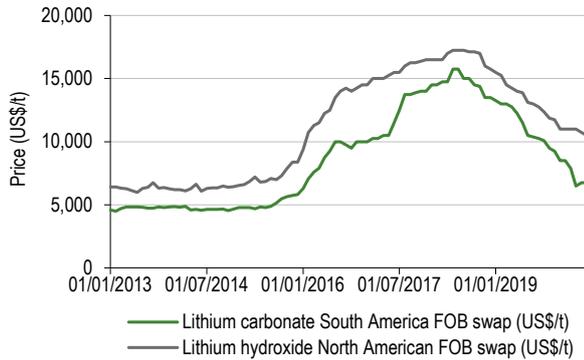
The most relevant changes in our pricing assumptions compared with those previously adopted are discussed below.

### Lithium hydroxide monohydrate price

We have left our long-term forecast of the lithium hydroxide monohydrate price unchanged at US\$14,021/t – albeit the dynamics in the market that underlie this assumption have changed.

We first adopted US\$14,021/t as our long-term lithium hydroxide price forecast in February 2019 (see [LiOH production beckons](#), published on 25 February 2019). At the time, both the lithium carbonate price and the lithium hydroxide price were relatively high (see Exhibit 11, below), albeit the premium of lithium hydroxide relative to lithium carbonate was relatively low (see Exhibit 12, below):

**Exhibit 11: Lithium hydroxide price and lithium carbonate price, January 2013 to present (US\$/t)**



Source: Bloomberg, Edison Investment Research

**Exhibit 12: Lithium hydroxide price premium vs lithium carbonate, January 2013 to present (US\$/t)**



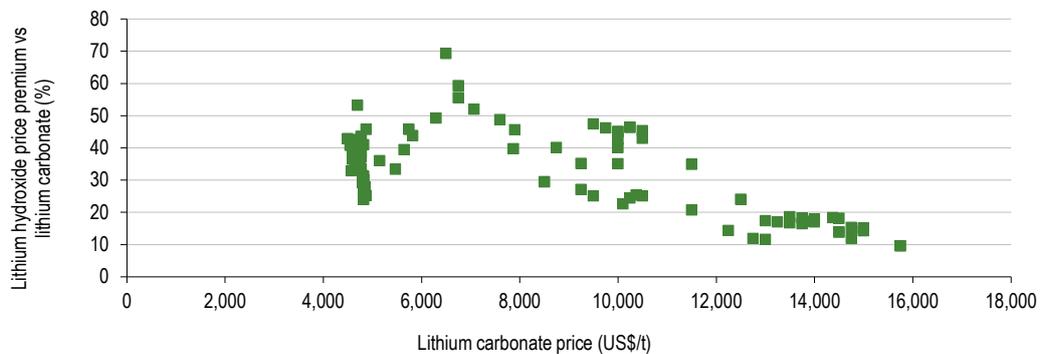
Source: Edison Investment Research. Note: Underlying data from Bloomberg and Edison Investment Research.

Our February 2019 long-term lithium hydroxide price was therefore derived from a long-term lithium carbonate price of US\$12,000/t and an anticipated lithium hydroxide premium of 16.8% per tonne. Note that in terms of lithium metal units alone, lithium hydroxide monohydrate would be expected to trade at a discounted price relative to lithium carbonate in the ratio 74:84 based on the different masses of the two salts per mole of lithium ions. The fact that it trades at a premium to lithium carbonate and that it has a lower volatility relative to its mean price is, to some extent, indicative of its increasing attractiveness as a chemical input for lithium-ion battery manufacturers.

Since February 2019, the prices of both lithium carbonate and hydroxide have continued to fall. However, after initially remaining low, since February of this year, the lithium hydroxide premium has increased sharply as the price of more specialised lithium hydroxide has stabilised while that of the more commoditised lithium carbonate continued to fall. As a result, in the past five months, lithium hydroxide has recovered the premium price relative to lithium carbonate that it used to enjoy prior to May 2017 (Exhibit 12).

One potential interpretation of this apparent behaviour is that the lithium hydroxide price premium (in percentage terms) is inversely correlated with that of lithium carbonate (ie a high lithium carbonate price correlates to a low lithium hydroxide price premium and vice versa) and this is, to some extent, borne out by statistical analysis. A regression analysis between the two (see Exhibit 13), reveals a Pearson product moment (correlation) coefficient of -0.66 which, given the number of data points in the analysis, is statistically significant at the 5% level (ie there is less than a 5% chance that the observed relationship between the two occurred by chance).

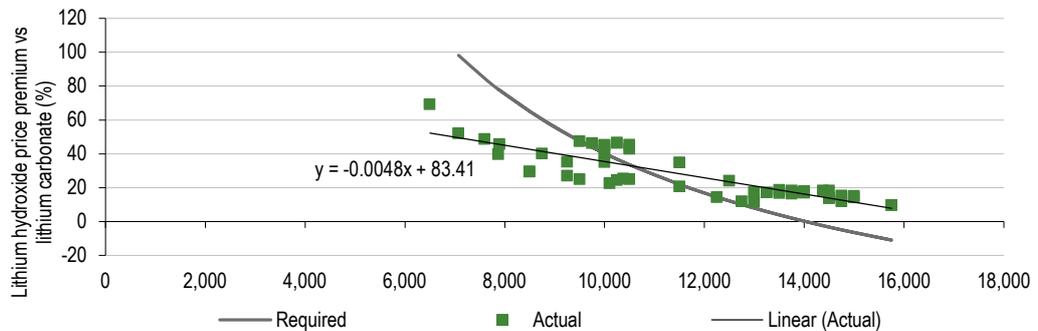
**Exhibit 13: Lithium carbonate price (US\$/t) vs lithium hydroxide price premium (%)**



Source: Edison Investment Research

However, if data points in which the lithium carbonate price is US\$6,500/t and below are excluded, the correlation coefficient improves to -0.85. The chart below shows the same analysis as that above for lithium carbonate prices above US\$6,500/t only. It also shows the price premium that is required for each price of lithium carbonate in order for the lithium hydroxide price to be US\$14,021/t (the grey curve).

**Exhibit 14: Lithium carbonate price (US\$/t) vs lithium hydroxide price premium (%) for prices above US\$6,500/t lithium carbonate only**



Source: Edison Investment Research

As can be seen from the above regression analysis:

- Any long-term lithium carbonate price above US\$9,500/t may be consistent with a lithium hydroxide price at or above US\$14,021/t.
- A long-term lithium hydroxide price of US\$14,021/t is consistent with a long-term lithium carbonate price of US\$10,568/t and a lithium hydroxide price premium of 32.7% (the intersection of the linear best-fit regression line with the 'Required' curve).
- Above a long-term lithium carbonate price of US\$11,500/t, the lithium hydroxide price is almost certain to be above US\$14,021/t.

As a consequence of this analysis, we are maintaining our long-term lithium hydroxide price of US\$14,021/t in anticipation of the long-term lithium carbonate price being above US\$10,568/t (previously our long-term lithium carbonate price estimate was US\$12,000/t). Variations from this assumption (using this analysis) are considered in the Sensitivities section on page 14, below. Note that Lepidico used BMI's more conservative long-term price forecast for its DFS.

### Caesium formate price

In our April note, we adjusted our assumed caesium formate price downwards, from US\$50,000/t to US\$37,000/t to reflect efforts by the world's majority supplier, Cabot Specialty Fluids, to stimulate demand by reducing prices. However, we have now partially reversed this fall to only US\$42,900/t, to reflect (albeit anecdotal) evidence that the market is stabilising at or around this level. This also brings our own long-term price forecast into line with that of Lepidico's DFS in what is otherwise a very opaque market, populated by relatively few participants.

### Rubidium sulphate price

Owing to its limited availability, rubidium formate has only been used in limited trials as a completion fluid. As a result, there is no known price for this rubidium salt. However, it has a specific gravity of 2.0 (cf potassium formate 1.6 and caesium formate 2.3) and therefore could be substituted for caesium formate in certain applications should commercial quantities be available. In particular, it could be substituted for caesium formate in its capacity as a drilling fluid in applications for which an average specific gravity of 1.9–2.0 is required, which could be achieved by blending potassium formate with rubidium formate, as opposed to caesium formate. Given our updated long-

term price forecast for caesium formate (above), we estimate that pricing parity for such an application could be achieved at a rubidium formate price of US\$13,437/t, which equates to a rubidium sulphate price of US\$13,135/t given the latter's fractionally higher mass per mole of rubidium ions.

## Foreign exchange

Since our last note in May (see [Developing to the \(L-\)Max](#)), the US\$/A\$ foreign exchange rate has declined from A\$1.5040/US\$ to A\$1.4545/US\$. While this is above its average rate of A\$1.4920/US\$ over the course of the past 12 months (source: Bloomberg, 8 July 2020), the average itself was skewed upwards by a spike in the rate to A\$1.7408/US\$ at the height of the coronavirus crisis, on 19 March 2020. Otherwise, the rate remains below (as far as the Australian dollar is concerned) its low point for the year of A\$1.4133/US\$ recorded on 18 July 2019 and well within what might be regarded as the recent 'normal' range.

## Valuation

### Project

With the caveat that costs were estimated to an accuracy of  $\pm 15\%$ , Lepidico's DFS calculated a project NPV<sub>8</sub> for the integrated Karibib mining and chemical plant operation of US\$221m, or then A\$340m (implying a prevailing forex rate of A\$1.5385/US\$). A comparison of these results with Edison's, using both its own economic inputs and those of the DFS are as follows:

Exhibit 15: Project NPV and IRR results using DFS and Edison economic inputs					
	DFS	Edison with DFS inputs	Variance cf DFS	Edison using own inputs	Variance cf DFS
NPV <sub>8</sub> (US\$m)	221.0	210.4	-4.8%	205.8	-6.9
IRR (%)	31.3	28.4	-2.9pp	27.4	-3.9

Source: Lepidico, Edison Investment Research

Updating the DFS's project-based NPV<sub>8</sub> of US\$221m to reflect the updated US\$/A\$ would imply a valuation of A\$321.4m or 6.2 Australian cents (cf 6.6c per share at the time of our last report, see [Developing to the \(L-\)Max](#)).

In our report, [Gold stars and black holes](#), we calculated a mean enterprise value (EV) for companies with projects at the DFS stage of development of 30.9% of project NPV (ranging up to 133.5%). This alone would imply an immediate valuation for Lepidico of 1.9c/share (ranging up to 8.3c/share) minus net debt (we estimate A\$3.5m, or 0.07c/share as at end June 2020 including LPD's liability relating to its inheritance of Desert Lion's convertible bond).

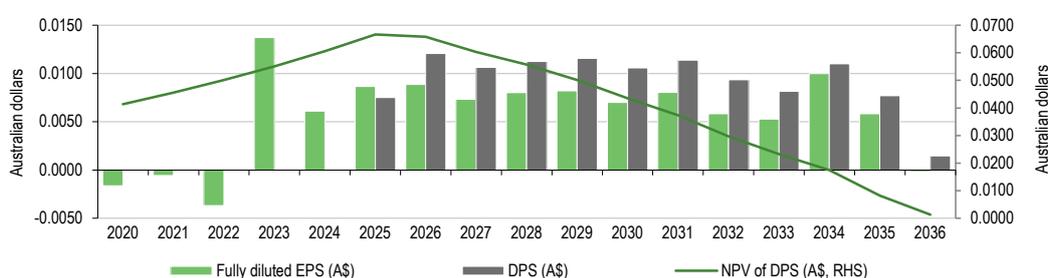
### Company

Our valuation of Lepidico varies from our value of the integrated Karibib mining and chemical plant project in that it takes into account Lepidico's 80% interest in the Namibian mine (but not the Abu Dhabi chemical plant), which will give rise to both a tax paying position in Namibia and a minority interest in the profits generated from mining operations. It also assumes ongoing corporate costs in the order of A\$3.1m pa. In addition, our company model assumes that Lepidico will also raise equity at a price of 2.9cps (as set out in our report, [Valuation update pending feasibility study](#), published on 6 April 2020) in order to achieve a maximum debt:equity ratio of 60:40. While 2.9c per share is some way above the current share price, Lepidico's shares have been sold down heavily since late January, not only because of weak sentiment surrounding lithium developers, but also on account of the effect of the coronavirus on world markets generally. Lepidico has assumed that it will take 12 months, to May 2021, to complete arrangements for securing binding product off-take agreements and a full funding package. Now that Lepidico's feasibility study has been completed, however, coronavirus concerns are abating and in the expectation that sentiment towards lithium developers

will improve, it is not unreasonable to assume that Lepidico's share price could recover to 1.8c and perhaps to as much as 8.2c (as per above). In this case, 2.9c is also the average price of Lepidico's shares between early November 2017 and late February 2020. It is also the price at which Lepidico announced the acquisition of Desert Lion and its last significant equity fund-raising in the form of a one-for-nine entitlement offer, in early May 2019, to raise A\$10.8m. Outside this scenario, management has indicated that it would be unlikely to commit to the equity dilution inherent in developing the project at prices much below this and, realistically (in Edison's view), not much below a price of 2c per share. Note that variations from this 'base case' scenario are considered in the Sensitivities section, below).

At a future equity raising price of 2.9c per share, a graph of our updated EPS and (maximum potential) DPS forecasts for Lepidico, assuming that it executes the project according to the updated Edison parameters set out in this report, is as follows:

**Exhibit 16: Edison estimate of future Lepidico EPS and (maximum potential) DPS**



Source: Edison Investment Research

Discounting (maximum potential) future dividends payable to Lepidico shareholders at our customary rate of 10% results in a net present value of the company's shares of 4.55c as at 1 July 2020. To this should then be added the value of Lepidico's envisaged future loan to the minority shareholders in the Namibian mining and concentrating operation, which we estimate to be 0.27cps, to result in a total value for Lepidico's shares of 4.82cps, based solely on its Phase 1 project.

Note that this valuation is fully diluted in that it accounts for an assumed A\$60.5m equity issuance in FY21 (cf A\$68.4m previously). It also treats the convertible bond that Lepidico acquired with its purchase of Desert Lion as conventional debt. However, the note may be converted into Lepidico equity at a price of 3.70 Canadian cents (3.92 Australian cents at the time of writing), at any time prior to maturity, which is 10 December 2020. No longer carrying any interest payments, if the convertible were instead fully converted into 108m Lepidico shares, our valuation reduces by less than 1%, to 4.55 Australian cents per share.

## Sensitivities

Within the context of the above discussion, our 'base case' valuation of Lepidico, above, is sensitive to at least eight specific factors – at least three of which are empirical by nature and the balance conceptual. These are considered below.

### COVID-19

The most evident risks to Lepidico from the uncertainty surrounding the coronavirus pandemic are volatile capital markets in the short term, and delays in the finalisation of agreements with third parties in the medium term. Otherwise, unless it becomes protracted, we do not believe that the coronavirus will have a material impact on long-term demand for lithium or the uptake of electric

vehicles in preference to traditional petrol engine vehicles. In the meantime, the company reports that constructive discussions continue with prospective offtake partners for the planned products from the Phase 1 chemical plant and samples continue to be prepared and dispatched for analysis. Essential feasibility study and corporate functions are continuing, non-essential functions have been curtailed and cash resources are estimated to be sufficient to sustain the business into mid-calendar 2021, assuming that the C\$4m convertible note is refinanced or converted.

## Lithium hydroxide price

Readers' attention is drawn to our discussion of the lithium hydroxide price on pages 10–12 of this report, which should be read in conjunction with this section. Our long-term lithium hydroxide price remains US\$14,021/t which equates – once the likely size of the lithium hydroxide premium is taken into account – to a lithium carbonate price of US\$10,568/t (note that most commentator's expectations appear to be for a long-term lithium carbonate price in the order of US\$12,000/t). Variations in our valuation of Lepidico with respect to the lithium hydroxide monohydrate price (with equivalent lithium carbonate prices shown, as per our discussion on pages 10–12) are as follows:

**Exhibit 17: Lepidico valuation sensitivity to lithium hydroxide price (Australian cents per share)**

Implied equivalent lithium carbonate price (US\$/t)	3,953	4,478	5,022	5,782	6,589	8,382	10,568	12,000	13,481	17,373
Lithium hydroxide price (US\$/t)	6,500	7,250	8,000	9,000	10,000	12,000	14,021	15,096	16,000	17,373
Change vs base case (%)	-53.6	-48.3	-42.9	-35.8	-28.7	-14.4	u/c	+7.7	+14.1	+23.9
Valuation (Australian cents/share)	0.38	0.57	1.28	1.61	2.46	3.64	4.82	5.45	5.98	6.78
Change vs base case (%)	-92.1	-88.2	-73.4	-66.6	-49.0	-24.5	u/c	+13.1	+24.1	+40.7

Source: Edison Investment Research

## Future equity funding price

Our financial model assumes that Lepidico will raise A\$60.5m in mid-calendar 2021 in order to achieve a future, maximum net debt:equity ratio of 60:40 and that it will raise this equity at a share price of 2.9c (see pages 13-14 and also our note, [Valuation update pending feasibility study](#)).

Exhibit 18, below, demonstrates the sensitivity of our valuation to the price at which future equity funding is conducted:

**Exhibit 18: Lepidico valuation sensitivity to future equity funding price**

Equity funding price (cents/share)	0.5	0.6	0.7	0.8	0.9	1.0	1.8	2.0	2.9	4.0	5.0	5.52
LPD valuation (cents/share)	2.12	2.39	2.63	2.84	3.03	3.21	4.15	4.31	4.82	5.20	5.43	5.52
Change vs base case (%)	-56.0	-50.4	-45.4	-41.1	-37.1	-33.4	-13.9	-10.6	u/c	+7.9	+12.7	+14.5

Source: Edison Investment Research

## Surface material

### Stockpiles

In addition to its in-situ resource, our site visit to Karibib also revealed clear evidence of a surface stockpile of broken massive lepidolite ore, being a legacy of former petalite mining at Rubicon, where it was considered waste. To date, this has been excluded from Karibib's formal mineral resource estimate (Exhibit 2). However, based on Desert Lion announcements, we estimate the size of the stockpile to be in the order of 657.6kt at a grade of c 0.7% lithium oxide with c 20kt in excess of 1.1% (cf an average grade of 0.40% Li<sub>2</sub>O at Rubicon). This being the case, we estimate that the stockpile could represent a material circa two years of feed to Karibib's concentrator, from which c 100–150kt of lepidolite concentrate could be produced without any associated cost of mining and therefore at relatively high margins.

### Slimes

Lepidico also has access to c 69kt of slimes, at an elevated grade of 0.95% Li<sub>2</sub>O, being the flotation tailings related to former petalite mining at Rubicon. While these require mineralogical test work

before their compatibility with the L-Max/LOH-Max process can be established, they nevertheless represent an additional potential source of concentrator feedstock for Lepidico. Utilisation of the slimes would also qualify as tailings disposal/remediation for environmental, social and governance (ESG) purposes.

## By-products

Our 'base case' valuation of Lepidico, as discussed above, is sensitive to its individual by-products' prices to the following degree (relative to our updated forecasts – see Exhibit 10):

<b>Exhibit 19: Lepidico valuation sensitivity to by-product pricing changes</b>					
Price change (%)*	-20%	-10%	u/c	+10%	+20%
<b>By-product</b>					
Rubidium sulphate	4.34	4.58	4.82	5.06	5.30
Caesium formate	4.60	4.71	4.82	4.94	5.05
Sulphate of potash (SOP)	4.66	4.74	4.82	4.90	4.98
Amorphous silica	4.74	4.78	4.82	4.87	4.91

Source: Edison Investment Research. Note: \*See Exhibit 10 for 'base case' pricing assumptions.

Readers are referred to Edison's report on the caesium and rubidium markets (see [Lepidico: Caesing the opportunity](#), published on 19 November 2019). Currently the United States is 100% dependent on imports of both caesium and rubidium and it is worth noting that, in May 2018, the US Department of the Interior cited both as 'critical' minerals and being of 'strategic' significance, raising the possibility that, via its elevated caesium and rubidium grades at the Karibib project, Lepidico could control the only significant, viable and unencumbered reserves/resources beyond the influence of Chinese interests.

## Project life extensions

Lepidico's current DFS envisages processing operations at its Abu Dhabi plant for 13 years being supported by mining and concentrating operations at Karibib for 12 years, at which point the mine's reserves will be exhausted. In addition to its reserve inventory at Karibib, however, Lepidico's chemical plant may also gain access to potential feedstock from ore sources such as Alvarrões, in Portugal, Separation Rapids and/or other third-party sources.

<b>Exhibit 20: Alvarrões resource inventory</b>				
Category	Tonnage (Mt)	Grade (% Li <sub>2</sub> O)	Contained Li <sub>2</sub> O (t)	Potential life (years)
<b>Alvarrões</b>				
Measured	0.00	0.00	0	0.0
Indicated	2.60	0.87	22,584	4.4
Inferred	3.27	0.87	28,471	5.6
<b>Total</b>	<b>5.87</b>	<b>0.87</b>	<b>51,055</b>	<b>10.0</b>

Source: Lepidico, Desert Lion, Edison Investment Research

While it is extremely early stage (and with the proviso that its inferred resources are eventually upgraded to the indicated category so that they may then become part of the mineral reserve inventory), we estimate that, in the event that Alvarrões is able supply lepidolite concentrate to Lepidico's Phase 1 L-Max/LOH-Max plant in Abu Dhabi on substantially the same terms as the Karibib operation in Namibia, it would add in the order of 1.59c to our 'base case' valuation to take the total to 6.41 Australian cents per share. If converted 100% into reserves, we estimate that resources at Helikon 2–5 at Karibib could also add a further c 3.7 years to the life of operations there. Self-evidently, these resources could also be expanded to increase this potential life of mine extension.

## Water and other technical and engineering

Desert Lion's business plan was based around a concentrator throughput rate of 2.35Mtpa and its water abstraction rates (which Lepidico has inherited) are consequently similarly based on this rate, which is materially in excess of Lepidico's initial throughput design rate of 320ktpa, rising to

514ktpa. As such, Lepidico's right to abstract 209,510m<sup>3</sup> of water pa is sufficient to support an almost doubling of production capacity to c 10ktpa of lithium hydroxide monohydrate equivalent and potentially more if it applies for additional water rights, either from further water bores close to the mine or by application to NamWater. As such, Lepidico's business plan at Karibib has expansion potential in addition to duplication potential and the potential for a large-scale Phase 2 plant (see below).

Four other initiatives that have the potential to augment the economics of Lepidico's mining plan at Karibib include: 1) the possibility of steepening the walls of the proposed open pits; 2) mining the footwall zone at Helikon 1, in particular, which has returned grades as high as 3% lithium oxide over 5–6m in exploration drilling; 3) conversion of resources to reserves at Helikon 2–5 and expansion of the resource base at these deposits; and 4) the potential for gold exploration success.

### **Phase 2 plant**

The Phase 1 L-Max/LOH-Max plant, to which Lepidico's DFS pertains, has never been conceived as anything other than a small-scale, commercially viable precursor prior to the development of a full-scale 20,000tpa commercial operation (denoted Phase 2) once scale-up risk from the 4,900tpa Phase 1 plant has been mitigated. A number of locations for the potential site of the Phase 2 plant are under consideration – the most obvious being either Abu Dhabi or Walvis Bay. The attraction of the Namibian option, in particular, is that a site at Walvis Bay would negate c US\$4–5m in annual concentrate freight costs (approximately US\$895/t lithium hydroxide produced) between Walvis Bay and Abu Dhabi. In mitigation of this, however, Abu Dhabi offers affordable gas, acid and power prices, among others, as well as a ready market for L-Max/LOH-Max's bulk products, in particular amorphous silica and SOP. Discussions between management and the authorities in a number of potential Phase 2 locations are understood to be ongoing and cost/benefit analyses performed. In the meantime, excluding any potential economies of scale relating to the larger plant, it might be assumed that the value of a 20,000tpa plant to Lepidico is approximately four times the value of a 4,900tpa plant (ie perhaps in the order of 19 Australian cents per share).

### **Financials**

According to its quarterly activities report for Q320, Lepidico had A\$2.9m in cash and cash equivalents at end March, since which time it has closed a one-for-nine entitlement offer (effectively a rights issue) to raise A\$3.86m via the issue of a total of 552.1m shares plus 276.0m options (including over-subscriptions) at a price of 0.7c per share.

**Exhibit 21: Financial summary**

Accounts: IFRS, year-end: June, A\$000s	2015	2016	2017	2018	2019	2020e	2021e	2022e
<b>TOTAL REVENUES</b>	9	116	127	171	2	0	0	0
Cost of sales	0	0	0	0	0	0	0	(24,628)
Gross profit	9	116	127	171	2	0	0	(24,628)
SG&A (expenses)	(455)	(617)	(912)	(5,284)	(4,006)	(7,001)	(3,146)	(3,146)
Other income/(expense)	0	0	0	0	0	0	0	0
Exceptionals and adjustments	(16)	(415)	(878)	(2,171)	(1,150)	(1,331)	0	0
Depreciation and amortisation	(5)	(6)	(6)	(6)	(8)	(163)	(163)	(163)
Reported EBIT	(467)	(923)	(1,670)	(7,290)	(5,162)	(8,496)	(3,309)	(27,937)
Finance income/(expense)	(18)	(5)	128	70	57	52	(383)	257
Other income/(expense)	(559)	(448)	(3,815)	0	0	0	0	0
Exceptionals and adjustments	0	(888)	0	0	0	0	0	0
Reported PBT	(1,044)	(2,263)	(5,357)	(7,220)	(5,105)	(8,444)	(3,693)	(27,680)
Income tax expense (includes exceptionals)	0	0	0	0	0	0	0	0
Reported net income	(1,044)	(2,263)	(5,357)	(7,220)	(5,105)	(8,444)	(3,693)	(27,680)
Basic average number of shares, m	178	465	1,802	2,624	3,272	4,648	5,934	6,943
Basic EPS (A\$)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
<b>BALANCE SHEET</b>								
Property, plant and equipment	9	4	8	27	18,487	24,907	26,096	75,803
Goodwill	0	0	0	0	0	0	0	0
Intangible assets	0	16,204	16,698	19,027	22,925	22,925	22,925	22,925
Other non-current assets	1,485	715	1,620	730	9,001	8,181	8,181	8,181
Total non-current assets	1,494	16,922	18,326	19,783	50,414	56,013	57,203	106,910
Cash and equivalents	53	650	3,307	4,860	13,660	4,048	54,661	54,661
Inventories	0	0	0	0	0	0	0	0
Trade and other receivables	4	3,886	706	712	1,869	2,609	2,609	8,360
Other current assets	0	0	0	0	0	0	0	0
Total current assets	57	4,537	4,013	5,572	15,529	6,657	57,270	63,021
Non-current loans and borrowings	0	0	0	0	3,276	7,532	3,276	87,310
Other non-current liabilities	0	0	0	0	0	0	0	0
Total non-current liabilities	0	0	0	0	3,276	7,532	3,276	87,310
Trade and other payables	105	614	1,663	804	10,940	7,496	6,759	5,862
Current loans and borrowings	115	0	0	0	0	0	0	0
Other current liabilities	40	33	46	51	86	86	86	86
Total current liabilities	260	647	1,709	856	11,026	7,581	6,844	5,948
Equity attributable to company	1,292	20,812	20,630	24,500	53,252	49,166	105,963	78,283
Non-controlling interest	0	0	0	0	(1,610)	(1,610)	(1,610)	(1,610)
<b>CASH FLOW STATEMENT</b>								
Profit for the year	(1,044)	(2,263)	(5,357)	(7,220)	(5,105)	(8,444)	(3,693)	(27,680)
Taxation expenses	0	0	0	0	0	0	0	0
Depreciation and amortisation	5	6	6	6	8	163	163	163
Share based payments	450	40	1,736	2,138	520	511	0	0
Other adjustments	(451)	1,036	(162)	2,066	664	1,641	0	0
Movements in working capital	(10)	132	133	(28)	410	(4,185)	(737)	(6,647)
Interest paid/received	0	0	0	0	0	0	0	0
Income taxes paid	0	0	0	0	0	0	0	0
Cash from operations (CFO)	(1,050)	(1,049)	(3,644)	(3,038)	(3,504)	(10,314)	(4,267)	(34,164)
Capex	(9)	(63)	(861)	(3,057)	(6,251)	(7,403)	(1,353)	(49,870)
Acquisitions & disposals net	0	32	122	110	0	0	0	0
Other investing activities	(563)	(80)	0	0	0	0	0	0
Cash used in investing activities (CFIA)	(572)	(111)	(739)	(2,947)	(6,251)	(7,403)	(1,353)	(49,870)
Net proceeds from issue of shares	1,505	1,872	7,040	7,555	18,462	3,847	60,489	0
Movements in debt	100	(115)	0	0	0	4,257	(4,257)	84,035
Other financing activities	0	0	0	0	0	0	0	0
Cash from financing activities (CFF)	1,605	1,757	7,040	7,555	18,462	8,104	56,233	84,035
Increase/(decrease) in cash and equivalents	(18)	597	2,657	1,570	8,707	(9,612)	50,613	0
Currency translation differences and other	0	0	0	(17)	93	0	0	0
Cash and equivalents at end of period	53	650	3,307	4,860	13,660	4,048	54,661	54,661
Net (debt)/cash	(61)	650	3,307	4,860	10,385	(3,484)	51,385	(32,649)
Movement in net (debt)/cash over period	(61)	711	2,657	1,553	5,525	(13,869)	54,870	(84,035)

Source: Company reports and accounts, Edison Investment Research. Note: FY19 balance sheet is Lepidico's stated balance sheet consolidated with Edison's estimate of Desert Lion's balance sheet as at 30 June 2019, converted into Australian dollars.

<b>Contact details</b> 23 Belmont Avenue Belmont Western Australia 6104 Australia +61 (08)9363 7800 www.lepidico.com	<b>Revenue by geography</b> N/A
<b>Management team</b> <b>Managing director: Julian 'Joe' Walsh</b> Joe is a resources industry executive and mining engineer with over 25 years' experience working in both mining companies (including in southern Africa) and investment banks. Within the industry, he was, among other things, PanAust's general manager, corporate development, and was instrumental in the evolution of the company from an explorer in 2004 to a >US\$2bn, ASX 100, multi-mine copper and gold company. He also has extensive equity market experience and has been involved with the technical and economic evaluation of many mining assets and companies around the world.	<b>General Manager Projects: Peter Walker</b> Peter is a metallurgist with more than 30 years' experience in the design, commissioning and operation of processing plants and general management of operations in Europe, Africa, Asia, Australasia and South America. As well as working for major and mid-tier mining companies, he has also worked for a number of engineering groups, specialising in lead/zinc, uranium, coal, nickel, copper, lithium and precious metals, among others. Most recently, he has managed a number of feasibility studies as well as developing both green and brown field projects in Thailand, Laos and Chile.
<b>General Manager Geology: Tom Dukovcic</b> With over 25 years' experience in exploration and development, Tom brings valuable geological, exploration and corporate management experience and skills to the board of Lepidico. He has worked in remote and inhospitable regions throughout Australia, including the Yilgarn, Kimberley, central Australia and north-east Queensland and internationally in South-East Asia and Brazil. During this time he has been directly involved with the management of gold and copper discoveries in Australia and gold in Brazil. He is a member of the Australian Institute of Geoscientists and a member of the Australian Institute of Company Directors.	<b>CFO &amp; joint company secretary: Shontel Norgate</b> Shontel is a Chartered Accountant with over 20 years' experience in the resources industry including debt and equity finance, financial reporting, project management, corporate governance and commercial negotiations experience in finance and administration. Prior to joining Lepidico, she was CFO of TSX-listed Nautilus Minerals for 10 years and before that she was the financial controller with Macarthur Coal and Southern Pacific NL, both listed on the ASX. She commenced her career as an auditor with Price Waterhouse (now PricewaterhouseCoopers).
<b>Principal shareholders</b>	<b>(%)</b>
Strategic Metallurgy Pty Ltd	7.09
Galaxy Resources	6.37
Computershare	3.03
Roytor & Co	1.35
Pella Ventures	1.10
Bacchus Cap	1.08
AIP Asset Management	1.04

## General disclaimer and copyright

This report has been commissioned by Lepidico and prepared and issued by Edison, in consideration of a fee payable by Lepidico. Edison Investment Research standard fees are £49,500 pa for the production and broad dissemination of a detailed note (Outlook) following by regular (typically quarterly) update notes. Fees are paid upfront in cash without recourse. Edison may seek additional fees for the provision of roadshows and related IR services for the client but does not get remunerated for any investment banking services. We never take payment in stock, options or warrants for any of our services.

**Accuracy of content:** All information used in the publication of this report has been compiled from publicly available sources that are believed to be reliable, however we do not guarantee the accuracy or completeness of this report and have not sought for this information to be independently verified. Opinions contained in this report represent those of the research department of Edison at the time of publication. Forward-looking information or statements in this report contain information that is based on assumptions, forecasts of future results, estimates of amounts not yet determinable, and therefore involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of their subject matter to be materially different from current expectations.

**Exclusion of Liability:** To the fullest extent allowed by law, Edison shall not be liable for any direct, indirect or consequential losses, loss of profits, damages, costs or expenses incurred or suffered by you arising out of or in connection with the access to, use of or reliance on any information contained on this note.

**No personalised advice:** The information that we provide should not be construed in any manner whatsoever as, personalised advice. Also, the information provided by us should not be construed by any subscriber or prospective subscriber as Edison's solicitation to effect, or attempt to effect, any transaction in a security. The securities described in the report may not be eligible for sale in all jurisdictions or to certain categories of investors.

**Investment in securities mentioned:** Edison has a restrictive policy relating to personal dealing and conflicts of interest. Edison Group does not conduct any investment business and, accordingly, does not itself hold any positions in the securities mentioned in this report. However, the respective directors, officers, employees and contractors of Edison may have a position in any or related securities mentioned in this report, subject to Edison's policies on personal dealing and conflicts of interest.

**Copyright:** Copyright 2020 Edison Investment Research Limited (Edison).

## Australia

Edison Investment Research Pty Ltd (Edison AU) is the Australian subsidiary of Edison. Edison AU is a Corporate Authorised Representative (1252501) of Crown Wealth Group Pty Ltd who holds an Australian Financial Services Licence (Number: 494274). This research is issued in Australia by Edison AU and any access to it, is intended only for "wholesale clients" within the meaning of the Corporations Act 2001 of Australia. Any advice given by Edison AU is general advice only and does not take into account your personal circumstances, needs or objectives. You should, before acting on this advice, consider the appropriateness of the advice, having regard to your objectives, financial situation and needs. If our advice relates to the acquisition, or possible acquisition, of a particular financial product you should read any relevant Product Disclosure Statement or like instrument.

## New Zealand

The research in this document is intended for New Zealand resident professional financial advisers or brokers (for use in their roles as financial advisers or brokers) and habitual investors who are "wholesale clients" for the purpose of the Financial Advisers Act 2008 (FAA) (as described in sections 5(c) (1)(a), (b) and (c) of the FAA). This is not a solicitation or inducement to buy, sell, subscribe, or underwrite any securities mentioned or in the topic of this document. For the purpose of the FAA, the content of this report is of a general nature, is intended as a source of general information only and is not intended to constitute a recommendation or opinion in relation to acquiring or disposing (including refraining from acquiring or disposing) of securities. The distribution of this document is not a "personalised service" and, to the extent that it contains any financial advice, is intended only as a "class service" provided by Edison within the meaning of the FAA (i.e. without taking into account the particular financial situation or goals of any person). As such, it should not be relied upon in making an investment decision.

## United Kingdom

This document is prepared and provided by Edison for information purposes only and should not be construed as an offer or solicitation for investment in any securities mentioned or in the topic of this document. A marketing communication under FCA Rules, this document has not been prepared in accordance with the legal requirements designed to promote the independence of investment research and is not subject to any prohibition on dealing ahead of the dissemination of investment research.

This Communication is being distributed in the United Kingdom and is directed only at (i) persons having professional experience in matters relating to investments, i.e. investment professionals within the meaning of Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "FPO") (ii) high net-worth companies, unincorporated associations or other bodies within the meaning of Article 49 of the FPO and (iii) persons to whom it is otherwise lawful to distribute it. The investment or investment activity to which this document relates is available only to such persons. It is not intended that this document be distributed or passed on, directly or indirectly, to any other class of persons and in any event and under no circumstances should persons of any other description rely on or act upon the contents of this document.

This Communication is being supplied to you solely for your information and may not be reproduced by, further distributed to or published in whole or in part by, any other person.

## United States

Edison relies upon the "publishers' exclusion" from the definition of investment adviser under Section 202(a)(11) of the Investment Advisers Act of 1940 and corresponding state securities laws. This report is a bona fide publication of general and regular circulation offering impersonal investment-related advice, not tailored to a specific investment portfolio or the needs of current and/or prospective subscribers. As such, Edison does not offer or provide personal advice and the research provided is for informational purposes only. No mention of a particular security in this report constitutes a recommendation to buy, sell or hold that or any security, or that any particular security, portfolio of securities, transaction or investment strategy is suitable for any specific person.

Frankfurt +49 (0)69 78 8076 960  
Schumannstrasse 34b  
60325 Frankfurt  
Germany

London +44 (0)20 3077 5700  
280 High Holborn  
London, WC1V 7EE  
United Kingdom

New York +1 646 653 7026  
1,185 Avenue of the Americas  
3rd Floor, New York, NY 10036  
United States of America

Sydney +61 (0)2 8249 8342  
Level 4, Office 1205  
95 Pitt Street, Sydney  
NSW 2000, Australia