

# Lepidico

Technical update

## LiOH production beckons

On 18 February, Lepidico announced that it had entered into a worldwide exclusivity arrangement over a new proprietary process (LOH-Max™) to produce lithium hydroxide from lithium sulphate. The technology uses established equipment and is expected to incur lower capital and operating costs than the conventional alternative. It seeks to capitalise on the growing preference among battery manufacturers for lithium hydroxide over lithium carbonate as a feedstock, which has resulted in the former now commanding a price premium over the latter. It also dispenses with the requirement for a sodium sulphate circuit in the plant, thereby further reducing capital costs as well as the commercial risks associated with producing this product.

Year end	Total revenues (A\$m)	Reported PBT* (A\$m)	Cash from operations (A\$m)	Net cash (A\$m)	Capex (A\$m)
06/17	0.1	(5.4)	(3.6)	3.3	(0.9)
06/18	0.2	(7.2)	(3.0)	4.9	(3.1)
06/19e	0.0	(5.9)	(6.2)	24.3	(21.4)
06/20e	19.9	2.5	3.2	(5.2)	(32.7)

Note: \*PBT is normalised, excluding amortisation of acquired intangibles and exceptional items.

## LOH-Max being incorporated into future planning

As a result of this arrangement, LOH-Max™ (hereafter LOH-Max) is being integrated into LPD's pilot plant, which nevertheless remains on budget and on schedule for commissioning in April prior to one month's operation in May incorporating LOH-Max. In the meantime, Strategic Metallurgy is developing the process design criteria for consultants Lycopodium to finalise the design for the LOH-Max circuit to be integrated into the Phase 1 plant project full feasibility study, which is expected to be completed next quarter.

## Potential capex savings quantified; opex to come

Cost comparisons conducted to date indicate that LOH-Max offers material reductions in both capex (estimated at more than US\$10m for a 5,000tpa lithium hydroxide operation) and opex relative to conventional methods of converting lithium sulphate into either lithium hydroxide or lithium carbonate. In addition, on account of their different molar masses, 5,000t of lithium carbonate equates to 5,679t of lithium hydroxide monohydrate in terms of the amount of contained lithium metal.

## Valuation: 6.84c/share potentially rising to 7.27c

On the basis of our updated assumptions, we estimate that execution of the 7t/hour Phase 1 plant will result in free cash flow to Lepidico of A\$71.2m per year once steady-state production has been achieved. Assuming US\$30m (A\$41.8m) of equity financing at the prevailing share price, this implies a valuation for Lepidico of A\$0.0684/share in FY19 (vs A\$0.0398 for the pre-LOH-Max plant), rising to A\$0.0910 in FY22 with a A\$5.2m net debt funding requirement, or A\$0.0727/share (in FY19) with an unchanged A\$16.8m net debt funding requirement (implying US\$21.2m in equity funding in H219; see page 4). Note that neither of these valuations ascribe value to the Phase 2 plant or other development options.

## Metals & mining

25 February 2019

Price **A\$0.031**

Market cap **A\$104m**

A\$1.3936/US\$

Net cash (A\$m) at end December 2018 8.0

Shares in issue 3,356.2m

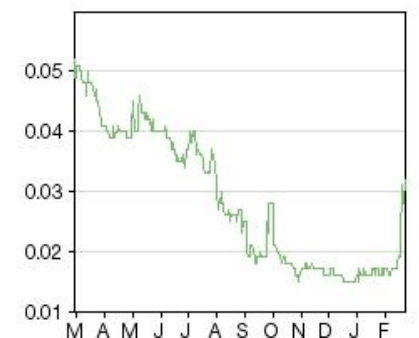
Free float 68%

Code LPD

Primary exchange ASX

Secondary exchange N/A

## Share price performance



% 1m 3m 12m

Abs 88.2 88.2 (40.7)

Rel (local) 78.7 74.0 (42.5)

52-week high/low A\$0.1 A\$0.0

## Business description

Lepidico provides exposure to a portfolio of lithium assets via its wholly owned properties, JVs and IP in Australia, Canada and Europe. Uniquely, it has successfully produced lithium carbonate from non-traditional hard rock lithium-bearing minerals using its registered L-Max process technology.

## Next events

Feasibility study Q2 CY19

Permits & approvals Mid-2018 to mid-2019

Pilot plant operation May 2019

Phase 1 final investment decision Mid-2019

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## Agreement

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On 18 February, Lepidico announced that it had entered into a worldwide exclusivity arrangement over a new proprietary process to produce lithium hydroxide from lithium sulphate. The process was developed in collaboration with the owners of Strategic Metallurgy (a material shareholder in Lepidico) and the agreement grants Lepidico the right to use the process and the sole rights for marketing the technology to third parties worldwide in exchange for Lepidico funding the development of the process.

## Rationale

The technology seeks to capitalise on the growing preference among battery manufacturers, in particular, for lithium hydroxide, rather than lithium carbonate, as a process feedstock, which has resulted in the former commanding a premium price compared to the latter. The technology uses conventional equipment and is expected to incur lower capital and operating costs than the erstwhile conventional process to convert lithium sulphate into either lithium hydroxide or lithium carbonate. It also dispenses with the requirement for a sodium sulphate circuit in the plant, thereby further reducing capital costs as well as obviating the commercial risks associated with the production of this material (eg low/negative/commoditised margins and potential additional environmental costs).

## Impact

Lepidico's intention is that L-Max will provide feed to LOH-Max in order to produce either lithium hydroxide or lithium carbonate, depending upon market conditions. In anticipation of this, LOH-Max is currently being integrated into LPD's pilot plant development, which nevertheless remains on budget and on schedule for commissioning in April prior to one month's operation in May (incorporating LOH-Max) in order to confirm the design performance of the major component parts of the plant in continuous process at an intermediate throughput rate of 15kg/hour and thereby to minimise subsequent scale-up risk to the Phase 1 plant.

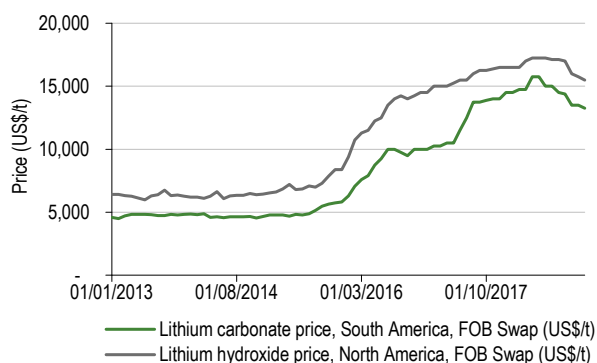
At the same time, in reviewing the engineering for the Phase 1 L-Max plant project, Lepidico has determined that a proportion of re-work will be required to integrate the LOH-Max process. To this end, Strategic Metallurgy is developing the process design criteria for consultants Lycopodium to finalise the design for the new circuit to be integrated into the Phase 1 plant project full feasibility study (which is therefore now expected to be completed during Q2 CY19, around the time of the pilot plant run in order to accommodate LOH-Max).

## Valuation considerations

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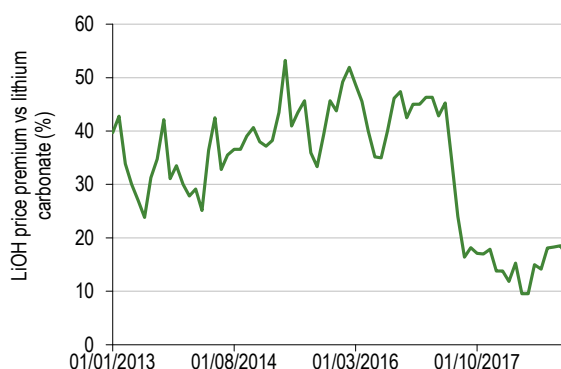
Lepidico has already conducted cost comparisons between LOH-Max and the conventional process to convert lithium sulphate to lithium hydroxide and has concluded that "material reductions in both capital cost – estimated at more than US\$10 million for 5,000tpa of lithium hydroxide – and operating cost should be achieved using LOH-Max." At the same time, lithium hydroxide commands a premium price compared to that of lithium carbonate that has ranged between 53.2% in April 2015 and 9.5% in June 2018:

**Exhibit 1: Lithium hydroxide price and lithium carbonate price, January 2013-present (US\$/t)**



Source: Bloomberg

**Exhibit 2: Lithium hydroxide price premium vs lithium carbonate, January 2013-present (US\$/t)**



Source: Edison Investment Research. Note: Underlying data provided by Bloomberg (Exhibit 1).

Although the premium of the lithium hydroxide (monohydrate) price over that of lithium carbonate has therefore narrowed materially over the course of the past two years, it has nevertheless still averaged 16.8% since May 2017. In addition, on account of their different molar masses, 5,000t of lithium carbonate equates to 5,679t of lithium hydroxide monohydrate in terms of the amount of contained lithium metal (ie a factor of 113.6%).

On the basis of the above assumptions regarding output (+13.6% LiOH vs lithium carbonate, ie configured to produce 100% lithium hydroxide monohydrate) and prices (16.8% LiOH premium) plus those set out in our note [Lepidico: Piloting its way through](#), published on 9 October 2018, our estimate of Lepidico's annual income statement once steady-state production at an (unchanged) output rate of 5,000tpa has been achieved at the Phase 1 L-Max plant (incorporating LOH-Max) is as follows:

**Exhibit 3: Edison estimate of Lepidico free cash flow once steady-state Phase 1 achieved**

	L-Max incorporating LOH-Max (current)	L-Max only (previous)
	Australian dollars	Australian dollars
Revenue	163,973,251	138,207,900
Costs	64,270,382	65,188,135
Gross profit	99,702,869	73,019,765
Depreciation	(5,837,053)	(9,220,921)
General & administrative costs	(3,146,290)	(3,146,290)
Operating profit	90,719,527	60,652,554
Net finance income	0	0
Loss before income tax	90,719,527	60,652,554
Income tax expense	22,679,882	15,163,139
Marginal tax rate (%)	25.0	25.0
Profit from continuing operations	68,039,645	45,489,416
Sustaining capex	(2,657,131)	(2,695,073)
Free cash flow	71,219,567	52,015,264

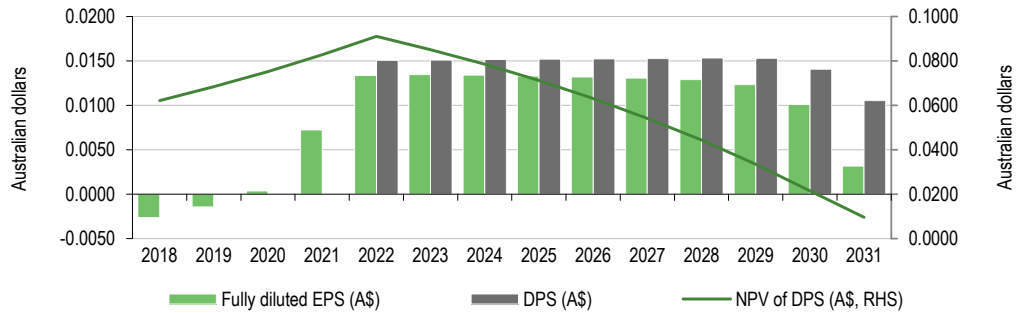
Source: Edison Investment Research

Discounted at a rate of 10% per year over 10 years, steady-state free cash flow of A\$71.2m pa (cf A\$52.0m previously) has a net present value of A\$437.6m (A\$319.6m previously). This reduces to A\$298.9m (A\$218.3m previously) to account for steady state not being achieved until FY23 and A\$225.6m (previously A\$173.3m) once initial capital expenditure had been taken into account.

Ultimately, however, our detailed valuation is derived from the discounting of future, real, maximum potential dividends to shareholders and thus depends, in part, on the degree and price of any future equity financing of Phase 1 capex. In our base case, we have consistently assumed US\$30m

(A\$41.8m at our updated forex rate of A\$1.3936/US\$) of equity financing in FY19, in this case via the issue of an additional 1.3bn shares at the prevailing share price of A\$0.031 later in the current financial year to finance the start of Phase 1 capex. All other things being equal, our ultimate valuation of Lepidico shares, on this basis, is A\$0.0684 (cf A\$0.0398 previously) at the start of FY19 (1 July 2018), rising to A\$0.0910 at the start of FY22, when the first (maximum potential) dividend is potentially payable to shareholders:

**Exhibit 4: Edison estimate of future Lepidico EPS and (maximum potential) DPS**



Source: Edison Investment Research

On account of the estimated US\$10m reduction in capex associated with the 5,000tpa operation however, this scenario is now extremely conservative in terms of implied future financial gearing/leverage (assuming the same US\$30m equity funding contingency). Whereas previously we had calculated a maximum requirement for the company of A\$16.8m in debt/strategic partner-sourced funding requirements, in the aftermath of the LOH-Max changes, this reduces to just A\$5.2m. Should Lepidico instead choose to maintain the same level of maximum net debt, then we calculate that it will require only US\$21.2m in equity funding in H219 via the issue of an additional 1.0bn shares at the prevailing share price, in which case our immediate valuation of the company in FY19 increases to A\$0.0727/share (vs A\$0.0677) on account of the lower subsequent equity dilution of the project's value.

**Exhibit 5: Financial summary**

Accounts: IFRS, Yr end: June, AUD: Thousands	2015A	2016A	2017A	2018A	2019E	2020E
Total revenues	9	116	127	171	16	19,948
Cost of sales	0	0	0	0	(2,090)	(11,170)
Gross profit	9	116	127	171	(2,074)	8,778
SG&A (expenses)	(455)	(617)	(912)	(5,284)	(3,868)	(3,146)
Other income/(expense)	0	0	0	0	0	0
Exceptionals and adjustments	(16)	(415)	(878)	(2,171)	0	0
Depreciation and amortisation	(5)	(6)	(6)	(6)	(9)	(3,277)
Reported EBIT	(467)	(923)	(1,670)	(7,290)	(5,951)	2,354
Finance income/(expense)	(18)	(5)	128	70	24	121
Other income/(expense)	(559)	(448)	(3,815)	0	0	0
Exceptionals and adjustments	0	(888)	0	0	0	0
Reported PBT	(1,044)	(2,263)	(5,357)	(7,220)	(5,927)	2,476
Income tax expense (includes exceptionals)	0	0	0	0	0	(619)
Reported net income	(1,044)	(2,263)	(5,357)	(7,220)	(5,927)	1,857
Basic average number of shares, m	178	465	1,802	2,624	3,803	4,705
Basic EPS	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
<b>Balance sheet</b>						
Property, plant and equipment	9	4	8	27	21,390	50,794
Goodwill	0	0	0	0	0	0
Intangible assets	0	16,204	16,698	19,027	19,027	19,027
Other non-current assets	1,485	715	1,620	730	730	730
Total non-current assets	1,494	16,922	18,326	19,783	41,147	70,551
Cash and equivalents	53	650	3,307	4,860	24,288	24,288
Inventories	0	0	0	0	1	1,662
Trade and other receivables	4	3,886	706	712	1,176	1,640
Other current assets	0	0	0	0	0	0
Total current assets	57	4,537	4,013	5,572	25,465	27,590
Non-current loans and borrowings	0	0	0	0	0	29,486
Other non-current liabilities	0	0	0	0	0	0
Total non-current liabilities	0	0	0	0	0	29,486
Trade and other payables	105	614	1,663	804	991	1,177
Current loans and borrowings	115	0	0	0	0	0
Other current liabilities	40	33	46	51	51	51
Total current liabilities	260	647	1,709	856	1,042	1,228
Equity attributable to company	1,292	20,812	20,630	24,500	65,570	67,427
Non-controlling interest	0	0	0	0	0	0
<b>Cashflow statement</b>						
Profit for the year	(1,044)	(2,263)	(5,357)	(7,220)	(5,927)	1,857
Taxation expenses	0	0	0	0	0	619
Depreciation and amortisation	5	6	6	6	9	3,277
Share based payments	450	40	1,736	2,138	0	0
Other adjustments	(451)	1,036	(162)	2,066	0	0
Movements in working capital	(10)	132	133	(28)	(279)	(1,939)
Interest paid / received	0	0	0	0	0	0
Income taxes paid	0	0	0	0	0	(619)
Cash from operations (CFO)	(1,050)	(1,049)	(3,644)	(3,038)	(6,197)	3,195
Capex	(9)	(63)	(861)	(3,057)	(21,373)	(32,681)
Acquisitions & disposals net	0	32	122	110	0	0
Other investing activities	(563)	(80)	0	0	0	0
Cash used in investing activities (CFIA)	(572)	(111)	(739)	(2,947)	(21,373)	(32,681)
Net proceeds from issue of shares	1,505	1,872	7,040	7,555	46,998	0
Movements in debt	100	(115)	0	0	0	29,486
Other financing activities	0	0	0	0	0	0
Cash from financing activities (CFF)	1,605	1,757	7,040	7,555	46,998	29,486
Increase/(decrease) in cash and equivalents	(18)	597	2,657	1,570	19,428	0
Currency translation differences and other	0	0	0	(17)	0	0
Cash and equivalents at end of period	53	650	3,307	4,860	24,288	24,288
Net (debt) cash	(61)	650	3,307	4,860	24,288	(5,198)
Movement in net (debt) cash over period	(61)	711	2,657	1,553	19,428	(29,486)

Source: Lepidico accounts, Edison Investment Research

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