

# Lepidico

Quarterly update

## Coming in sight of the Rubicon

Lepidico is awaiting the delivery of Phase 1 control estimates from its EPCM contractor ahead of making a final investment decision (FID) on its Karibib integrated lithium mine and chemical plant project in September. Within this context, it has now almost completed the resourcing of its executive management team with four major recent appointments at a time when the price of lithium chemicals has continued to hover close to record highs (in sharp contrast to most other metals).

Year end	Total revenues (A\$m)	PBT (A\$m)	Cash from operations (A\$m)	Net cash/(debt)* (A\$m)	Capex (A\$m)
06/20	0.0	(10.8)	(4.7)	(0.4)	(7.5)
06/21	4.1	(0.3)	1.0	14.7	(0.6)
06/22e	0.0	(6.2)	(4.2)	10.6	(7.4)
06/23e	0.0	(3.4)	(3.3)	8.7	(55.1)

Note: Historical numbers include Desert Lion Energy convertible.

## One of the first of the new wave

After a two-year hiatus during the period of the coronavirus crisis, in which almost no new lithium projects were announced, Lepidico's Karibib project is one of the first projects to be at the point of an FID in the current cycle.

## Phase 2 Plant project thinking develops to next phase

While it is approaching an FID on its Phase 1 Plant project, Lepidico has also been refining its strategy in relation to the development of a full-scale Phase 2 Plant, possibly to be located in Europe, Namibia, the UAE or US. Where before this had been conceived of as a fully integrated, owner-operated project, it is now being thought of as a centralised processing facility taking concentrate from third-party lepidolite mines as well as an expansion at Karibib in or near the Atlantic basin, putting Lepidico in a unique position to develop a global market for lithium mica concentrate outside China.

## Valuation: Ticking upwards

We have put our estimate of project timing back by six months to take account of longer lead times for securing key contracts and the delivery of equipment. Nevertheless, our core valuation of Lepidico has increased to 6.66 Australian cents per share (cf 6.64c/share previously) plus a potential, risk-adjusted 0.63–1.55 cents for a conceptual 20,000tps LCE Phase 2 Plant to take the total aggregate conceptual valuation to 7.29–8.21 cents (fully diluted). While our valuation of the Phase 2 Plant has, at first glance, fallen since our last note, this change reflects our assumption that Lepidico will now buy in approximately two-thirds of the material required to feed the plant rather than mining it. While this change in business model has increased our forecast of the plant's opex, it exposes it to much faster increases in valuation as third-party ore resources are made available to its operation. The change also potentially shortens the route to development of the enlarged plant by two to three years. Note that this valuation does not attribute any value to Lepidico from any other potential development options (eg third-party technology licensing).

## Metals and mining

5 August 2022

Price **A\$0.028**

Market cap **A\$182m**

A\$1.4391/US\$

Net cash (A\$m) at end-December 2021 10.4  
(excludes A\$6.2m in lease liabilities)

Shares in issue 6,507.2m

Free float 78%

Code LPD

Primary exchange ASX

Secondary exchange N/A

## Share price performance



% 1m 3m 12m

Abs 7.7 (6.7) 33.3

Rel (local) 1.6 (2.0) 43.9

52-week high/low A\$0.05 A\$0.02

## 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 and LOH-Max processes.

## Next events

Independent consultant's report August

Debt finance package Q322

Commencement of mining Q1 CY23

Chemical plant commissioning H2 CY23

## Analyst

Lord Ashbourne +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

---

Since our last note on the company (see [Big swings and small roundabouts](#), published on 16 February), Lepidico has continued to develop its Karibib project in Namibia and Abu Dhabi, first, by the appointment of new – and key – personnel to the project and, second, and more recently, by the pursuit of new initiatives regarding the development of its Phase 2 project (P2P).

While there has been some slippage in the overall timeline of the project – not least given the COVID-19 pandemic – the delay amounts to only a matter of months. As such, it is still the company's intention to make an FID in the current quarter (Q3 CY22), with a board meeting scheduled for late September, when the Phase 1 control estimates, implementation schedule and revised economics will be presented along with an expected development recommendation by management.

## Phase 2 project (P2P)

---

Lepidico has recommenced exploration within the 293km<sup>2</sup> over which it has prospecting rights at Karibib, with a view to increasing its resource to a size that is sufficient to a) extend the Phase 1 Plant project operating life to more than 20 years and b) support a Phase 2 Plant. Management's initial target is to increase the combined resource at Helikon 2-5 from 2.2Mt to 5.0–7.0Mt, which it believes would be sufficient to support a Phase 2 Plant of approximately the same size as its Phase 1 plant of c 5,000tpa, which could be located in either Namibia, Europe or North America (note that this compares with the aggregate tonnage of 9.0Mt at Rubicon 1 and Helikon 1 currently dedicated to supporting the Phase 1 plant). Beyond this, management believes that a 10–12Mt resource inventory would support a c 10,000tpa Phase 2 plant. However, the ostensible goal of the programme is to delineate a resource of c 25Mt, which management estimates could support a full 20,000tpa Phase 2 plant. However, where before this was conceived as a fully integrated, purely owner-operated project, in recent months Lepidico reports that it has received unsolicited enquiries from as many as four junior explorers in or near the Atlantic basin that have been exploring pegmatite fields and identifying lepidolite-rich mineralisation. Several of these are reported to be in the process of being drilled and a number have sent samples to Lepidico to ascertain their material's amenability to its proprietary L-Max and LOH-Max processes. To expedite development, therefore, rather than seeking to license its technology, Lepidico is in the process of investigating the construction of a P2P specifically designed to handle concentrate from third-party sources in conjunction with material from an expansion at Karibib.

According to its Phase 1 Plant project DFS (see [Valuation update post-feasibility study](#), published on 20 July 2020), Lepidico will mine c 0.5Mt ore pa at an average life-of-mine strip ratio of 3.8 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%. The chemical plant will then process c 56,700t concentrate (dry) pa to produce up to 5,600tpa lithium hydroxide monohydrate. As mining encounters lower-grade material in the lower horizons of Rubicon, however, the plant has been designed to accommodate a near doubling in throughput rates by the eighth year of the project via the addition of an additional leach tank. Over the life of its operation, ore mined for the Phase 1 Plant project is estimated to amount to 6.6Mt, or 73.0% of combined Rubicon 1 and Helikon 1 in-situ tonnage. By contrast, a Phase 2 plant with the capacity to produce 20,000tpa of lithium carbonate equivalent, or 22,717tpa lithium hydroxide monohydrate equivalent, would require an in-situ tonnage of 19.2Mt ore pro rata, which would be presumed to originate from Lepidico's other deposits at Karibib (ie Helikon 2-5), new discoveries in the Karibib mining and prospecting licence areas (see below) and third-party mines.

The existing resource at Helikon 2-5 amounts to 2.2Mt at an average grade of 0.41% lithium oxide:

<b>Exhibit 1: Mineral resource estimate, Helikon 2-5 (January 2020)</b>						
Deposit	Category	Cut-off grade (% Li <sub>2</sub> O)	kt	Grade (% Li <sub>2</sub> O)	Contained Li <sub>2</sub> O	Contained LCE
Helikon 2	Inferred	0.20	216.0	0.56	1,210	2,991
Helikon 3	Inferred	0.20	295.0	0.48	1,416	3,501
Helikon 4	Inferred	0.20	1,510.0	0.38	5,738	14,189
Helikon 5	Inferred	0.20	179.0	0.31	555	1,372
<b>Total</b>	<b>Inferred</b>	<b>0.20</b>	<b>2,200.0</b>	<b>0.41</b>	<b>8,919</b>	<b>22,054</b>

Source: Lepidico, Edison Investment Research. Note: LCE = lithium carbonate equivalent.

At 0.41% lithium oxide, the average grade of Helikon 2-5 compares well with the average resource grade of Rubicon 1 and Helikon 1 combined of 0.43% and the average reserve grade of Rubicon 1 and Helikon 1 combined of 0.46%. Current exploration work at Karibib is focusing on Helikon 4 and pushing down strike towards Helikon 3 and Helikon 2, with a target of delineating an additional 4–5Mt of ore at a grade of 0.5% lithium oxide (Li<sub>2</sub>O). Within this context, on 27 June, Lepidico announced that drilling at Helikon 4 had returned the broadest high-grade lithium intercepts to date at Karibib, while a new lepidolite-bearing pegmatite had also been identified at the Homestead prospect with a strike of at least 250m and a downhole width of up to 31m. Precise details of its drilling results are included in [its announcement](#). However, highlights of the programme to date have been:

- Broad intercepts of lepidolite mineralisation at Helikon 4, including 40m at a grade of 1.08% Li<sub>2</sub>O and 20m at 1.16% Li<sub>2</sub>O.
- A weighted average intercept grade of 0.60% Li<sub>2</sub>O from new drilling (cf an existing inferred resource grade of 0.38% Li<sub>2</sub>O – see Exhibit 1, above), which has also extended the zone of mineralisation at Helikon at depth, where it remains open.
- A new lepidolite-bearing pegmatite confirmed by reverse circulation drilling at the Homestead prospect, 1.6km along strike from Helikon 2-5 (which is currently being chased down plunge).
- The completion of trenching and sampling of Rubicon stockpiles with the intention of contributing to an updated mineral resource estimate with additional tonnage in the indicated category in particular to allow it to be included in the Phase 1 mine plan.
- Regional exploration has been successful in identifying blind pegmatite targets under surface cover and scout drilling is now seeking lithium mica mineralisation associated with associated surface rubidium anomalies.

Preparation is also underway to start exploration activities to the east of EPL5439 on several priority lithium and gold targets. Exploration there is intended to continue throughout 2023, with the aim of expanding resources to support a significantly larger Phase 2 Plant project. However, turnaround times for assay results have been slow – which is a global issue – and it has become increasingly apparent to management that the best means of expediting the Phase 2 Plant project may be to employ otherwise redundant material at third-party sites, while continuing to expand resources at Karibib, albeit in a more structured manner.

## Revised Phase 2 project economics

We have provided a conceptual, risk-adjusted valuation for Lepidico’s Phase 2 Plant project on two previous occasions – the first in June 2021 when we valued the project at US\$594.7m, unrisksed but fully diluted (see [Phase 2 coming into view](#), published on 18 June 2021) and the second, in February 2022, when we valued it at US\$851.9m or 0.73-1.77 Australian cents per share after we had updated our long-term lithium price forecasts (see [Big swings and small roundabouts](#), published on 16 February 2022). In formulating these valuations, we made the following assumptions:

- The geological characteristics of the Phase 2 Plant project orebody approximated those of Karibib, but scaled up to support a mining rate 2.9x the Phase 1 project operation. The stripping ratio, ore grade, recovery and mass pull were all assumed to be the same as the Phase 1 operation to result in 2.9x the production of concentrate.
- Production and consumption of concentrate into end-products was assumed to be in balance (ie negligible stockpiles of concentrate were presumed to be created).
- Output from the chemical plant was assumed to be 20,000tpa lithium carbonate equivalent (LCE), or 22,717tpa lithium hydroxide monohydrate equivalent, with the production of end-products (lithium hydroxide monohydrate, rubidium sulphate, caesium formate, sulphate of potash and amorphous silica) assumed to be pro rata to the Phase 1 Abu Dhabi chemical plant production profile.
- Unit mining and processing costs were assumed to be the same as for the Karibib and Abu Dhabi chemical plant operations, with the exception that 70% of costs were presumed to be variable (and scaled up 2.9x therefore) and 30% were assumed to be fixed and therefore invariant to scale.
- In March 2021, Lepidico quoted scoping study design parameters as indicating a capital intensity of US\$16,900/t LCE or US\$10,500/t after credits for a 20,000tpa LCE plant operation (note: for these purposes, capital intensity was defined as pre-production capital per tonne of annual LCE plus by-products adjusted to lithium hydroxide equivalent). On this basis, we estimated initial capex for the Phase 2 plant of US\$238.5m (being 10,500 x 22,717) plus capex for the mine (all distributed over three years). In this case, we assumed that capex for the mine would be pro rata to the Karibib mining and concentrating operation and would amount to US\$124.2m. We therefore estimated total pre-production capex of US\$362.8m, or US\$15,972/t lithium hydroxide monohydrate equivalent to be funded from retained earnings from the Phase 1 Plant project (ie with no additional assumed dilution), which compared with an equivalent figure of US\$139.0m and US\$17,758/t for the Phase 1 Plant project (Edison calculation excluding working capital). Sustaining capital was assumed to be pro rata to the Phase 1 Plant project.
- Depreciation was assumed to be over 10 years.
- The corporate tax rate was assumed to be the global average corporate tax rate of 23.65% (source: KPMG corporate tax rate tables for 2021–22).

The resulting valuations were then risk adjusted for a) their stage of development (which was deemed to be 'scoping study' stage) and/or b) their resources relative to those required to support a 20,000tpa LCE Phase 2 plant.

For the purposes of our revised and updated Phase 2 Plant project valuation, we have left these assumptions unchanged with the following modifications:

- Of the increase in scale required by the Phase 2 Plant relative to the Phase 1 Plant, we have assumed that 1.0x of the 2.9x factor involved will be supported by resources at Karibib – and more specifically at Helikon 2-5 – and that the additional 1.9x factor will be supported by resources from third parties. Note that this updated assumption affects our tax and capex assumptions, as well as our (integrated) operating cost assumptions.
- As a consequence of the above, rather than assuming that concentrate will be delivered to the plant from a fully integrated owner-operated mine, we are now assuming that it will be purchased from a third-party supplier (on the same basis that Lepidico's chemical plant will purchase lithium mica concentrate from the Karibib mine), which inevitably acts to increase variable costs.

All other things being equal, our estimate of indicative Phase 2 Plant project economics in a typical year (relative to previous estimates), is as shown in Exhibit 2, below.

**Exhibit 2: Conceptual Phase 2 Plant project income statement**

US\$m pa	Ore from third-party sources (August 2022)	Revised lithium price (February 2022)	Original estimate (June 2021)
Revenue	365.6	365.6	356.4
Fixed costs	15.1	15.1	19.2
Variable costs	128.0	102.5	130.2
Gross profit	222.5	248.1	207.0
Depreciation	29.4	38.2	36.3
EBIT	193.1	209.9	170.7
Interest	-	-	-
Pre-tax profit	193.1	209.9	170.7
Tax	47.5	49.6	40.4
Tax (%)	23.65	23.65	23.65
Profit after tax	145.6	160.3	130.3
Free cash-flow	175.1	198.4	166.6
Sustaining capex	3.5	4.8	4.8
Net cash-flow	171.6	193.6	161.8

Source: Edison Investment Research, Lepidico

Discounting 20 years' worth of cash flows of this order of magnitude back to present value at a discount rate of 10% and subtracting US\$281.4m in initial capex (cf US\$362.8m previously) yields a preliminary theoretical value for the Phase 2 Plant project of US\$783.6m (cf US\$851.9m previously) at the start of capex, or US\$0.0919/share (cf US\$0.1088/share previously), post-assumed FY23 equity funding. Readers should note that significant exploration success at Karibib or the acquisition of another in-ground asset could result in a vertically integrated Phase 3 Project, which is consistent with Lepidico's growth ambitions. At this stage, we are choosing not to model such a concept. However, as before, there remains considerable value upside from royalties associated with process technology licensing.

### Risked conceptual Phase 2 Plant project

As before, we have applied two methods to adjust the above valuation to reflect risk to the Phase 2 Plant project implementation.

#### Method 1: Stage of development risk

The capital intensity estimate for the Phase 2 Plant is quoted as being performed to 'scoping study design parameters', while the operational cost estimates are compiled to a DFS standard – albeit there is no guarantee that either the mining or the chemical cost portions of a Phase 2 Plant project would approximate those at Karibib and Abu Dhabi, respectively. As such, a preliminary economic assessment (PEA) level risk factor applied to our valuation (above) could be appropriate in formulating a risk-adjusted valuation for a conceptual Phase 2 Plant project. Alternatively, it could be stated that we believe our valuation to be correct in the event that the assumed parameters are confirmed in a PEA or scoping-level study. In our report [Gold stars and black holes](#), we calculated a mean enterprise value for companies with projects at the PEA or scoping study stage of development of 11.7% of project net present value (NPV). This would imply an immediate valuation for the Phase 2 Plant project of US\$91.7m, or 1.08 US cents per share (1.55 Australian cents per share) post-assumed FY23 equity funding.

#### Method 2: Resource risk

In order to support a 20,000tpa LCE chemical plant operation, we estimate that a 1.7Mtpa ore processing capacity would be required. Over 20 years, this would imply a required ore reserve of c 34Mt (at a similar grade to the current ore reserve) which, at the existing reserve:resource conversion ratio at Rubicon 1 and Helikon 1 of 74.3% (by tonnage), would imply a minimum resource of 45.9Mt at an acceptable minimum grade to support a Phase 2 plant. This compares

with a current resource at Helikon 2-5 of 2.2Mt (see Exhibit 1) or 4.8% of that ultimately required. Invoking this percentage as an appropriate measure to apply to the valuation of US\$783.6m implies a risked valuation of US\$37.5m, which equates to 0.44 US cents per share or 0.63 Australian cents per share (post-assumed FY23 equity funding). In this case, however, resources contributed by third parties to the Phase 2 Plant project may increase much more rapidly than at Karibib alone under the fully integrated, owner-operator model.

### **Third-party model timing and implementation considerations**

Management estimates that the use of third-party ore to feed into the Phase 2 Plant could take two to three years out of a typical mine-concentrator project development timeline.

In the first instance, Lepidico will require approximately one year in which to upgrade its resource at Helikon from the inferred category into the measured and indicated categories, and thence into the proven and probable categories of reserves. As presently conceived, the Karibib Phase 1 Plant project has the following attributes:

- It already has road access to the project.
- It has water rights over twice its planned requirements.
- The installed power line has capacity for twice the project's electricity requirements.
- Its cyclones have twice the capacity required for the anticipated throughput.
- It has already been designed to accommodate a doubling in throughput rates by the eighth year of the project.

Doubling the capacity of the Karibib concentrator earlier than originally planned will therefore require little more than the already planned expansion (see page 2) to be brought forward plus an additional ball mill, with the result that it should be relatively easy and very capital efficient.

Thereafter, Lepidico will embark on approximately two years of engineering works, which should be abundant time for a third party to delineate an appropriate resource to contribute to the Phase 2 Plant. Once delineated, the third party would then conduct a feasibility study on its mining and concentration project incorporating Lepidico's concentrator design.

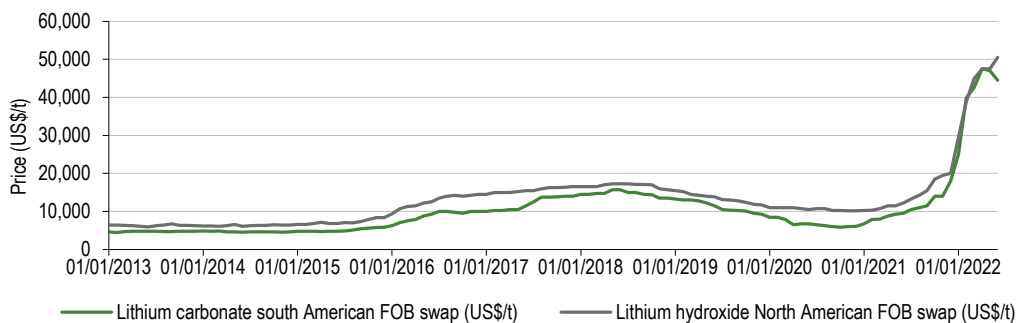
By mid-2024, therefore, Lepidico should have an appreciation of the potential resources available to contribute to the Phase 2 Plant project, at the same time as its chemical plant in Abu Dhabi is coming on-steam. As such, it would be in a position to undertake the front-end engineering and design (FEED) aspects of its own feasibility on the larger Phase 2 Plant project within the context of its actual experience of the operation of the Abu Dhabi plant. On this basis, it is possible that the development of the Phase 2 Plant project could occur as early as CY27.

## **Lithium price**

---

### **Short term**

The prices of both lithium carbonate and lithium hydroxide have continued to rise sharply since our last note on Lepidico, as the global economy has recovered from the coronavirus crisis from 2021 onwards and the market has been squeezed upwards as previously depleted stocks of lithium chemicals and concentrates throughout the supply chain have been replenished – especially in China – causing prices to bounce sharply.

**Exhibit 3: Lithium hydroxide and lithium carbonate prices, January 2013 to present (US\$/t)**


Source: Bloomberg

Anecdotally, it has been reported that Tesla is paying prices for lithium chemicals that are 16–17% higher than in September last year, contributing to a 25–30% increase in its vehicle prices as its order book has continued to grow – indicating that consumer demand has, so far, proved to be relatively insensitive to electric vehicle pricing. While spot prices of lithium chemicals have stabilised since March, therefore, contract prices are continuing to rise, with a number of traders now anticipating that the two will converge in the US\$30,000–40,000/t (cf our long-term lithium hydroxide price forecast of US\$18,000/t – see [Big swings and small roundabouts](#), published on 16 February).

## Longer term

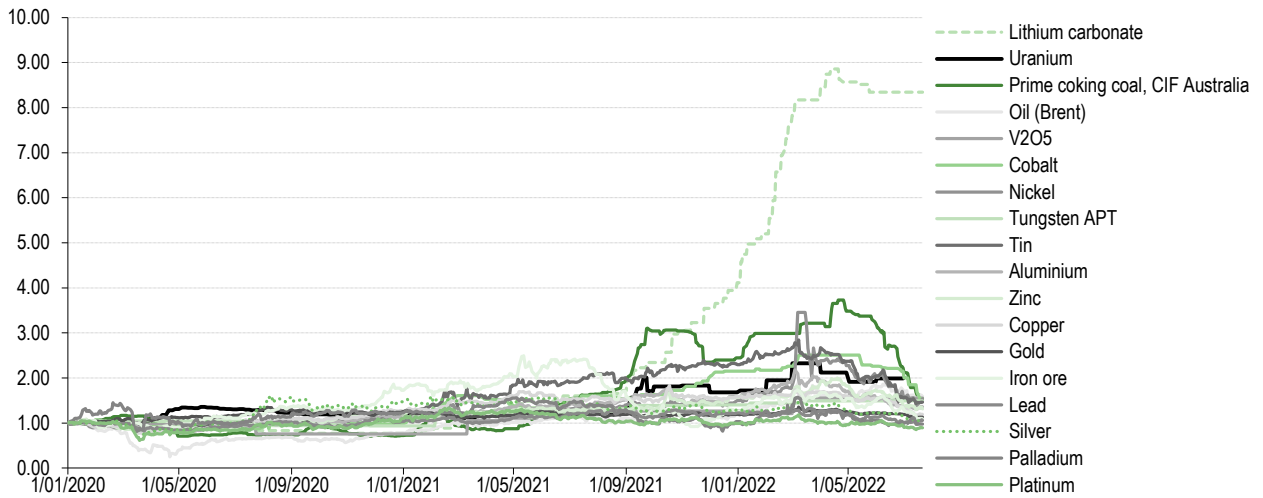
Most advanced countries have mandated that the sale of new internal combustion engine vehicles be discontinued from 2030. Simultaneously, China has been rapidly growing its battery capacity, opening its one hundredth lithium ion gigafactory later this year (cf one in the US) and with ambitions to have 140 such facilities operational by the end of the decade. Moreover, China has also been effective in proactively securing the raw material feed for its installations, presenting both the US and Europe with an appreciable challenge in their quests to develop their ‘green’ infrastructure. As a consequence, the US Department of Energy is forecasting that demand for lithium chemicals will rise to in excess of 3Mt by 2030 from less than 1Mt three years ago. This level of growth would almost certainly require an increase in real-term lithium prices over a protracted period in order to be achieved and would therefore (all other things being equal) naturally contribute to an increase in electric vehicle prices. However, even at these accelerated growth rates, the limiting factor for vehicle production will be the availability of lithium chemicals for batteries and forecasts suggest that the supply of electric vehicles in 2030 may amount to only 30–40% of demand, with the result that prices will then have to rise further to effect demand destruction and bring supply and demand into balance.

Nevertheless, exploration and mine development was severely curtailed in 2018–20, despite the longer-term expectation that:

- electric vehicle demand will account for nearly half of all cars sold by 2030;
- battery power will increase 13x relative to today; and
- lithium demand will sextuple from 2019 to 2030.

Set against this background of secular growth, lithium prices have thus largely avoided the cyclical downturns that have affected other, more established metals since April 2022 in anticipation of lower near-term economic growth as a result of resurgent inflation and the need to counteract rising prices with increased interest rates.

**Exhibit 4: Relative metals price performances, January 2020 to present (factor)**



Source: Edison Investment Research (underlying data: Refinitiv)

An additional recent feature of the market for lithium chemicals is that the formerly stable relationship between lithium carbonate and lithium hydroxide prices apparent until the end of 2021 now appears to have broken down. This is evidenced by the graph of (absolute) lithium hydroxide premiums relative to the lithium carbonate price since January 2013, showing notably increased volatility since late 2021:

**Exhibit 5: Lithium hydroxide price premium to lithium carbonate, January 2013 to present**

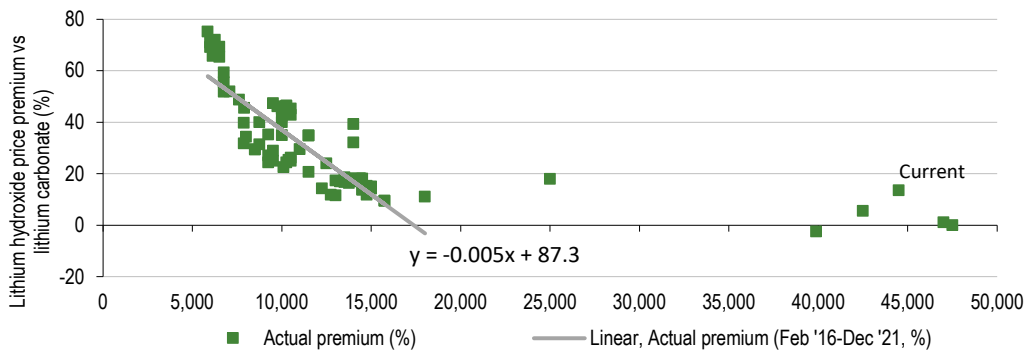


Source: Edison Investment Research (underlying data: Bloomberg)

It is also evidenced by the disruption to the erstwhile statistically significant relationship between lithium carbonate and lithium hydroxide prices in percentage terms since the start of 2016 (below), strongly indicating that the prior relationship has either broken down or shifted to a new level:



**Exhibit 6: Lithium carbonate price (US\$/t) versus lithium hydroxide price premium (%)**



Source: Edison Investment Research (underlying data: Bloomberg)

A possible explanation for the apparent shift in the observed relationship between the lithium carbonate price and the lithium hydroxide price premium is that, historically, the bulk of lithium was produced from South American brines, which were typically processed into lithium carbonate. This could then be further processed into lithium hydroxide, albeit at a cost which was recouped in the form of the lithium hydroxide price premium. Hence, lithium hydroxide almost invariably traded at a premium to lithium carbonate to reflect the cost of conversion. At present, however, the majority of new lithium capacity is in the form of hard rock mining to produce spodumene concentrate and thence to lithium hydroxide without the need for a lithium carbonate intermediate product. Hence, in future, unlike the past, there will be no (or, at least, a reduced) expectation of a causal relationship between the price of lithium carbonate and the price of lithium hydroxide.

## Lithium price environment consequences

In the future (and with the benefit of hindsight), it may be seen that 2022 represented a point of inflection for the lithium price, at which it moved to a permanently higher level. Our mining valuations are typically conducted in real terms, which has the result of negating the effect of general inflation on both product prices and costs. For the moment, we are leaving our forecast, (real) long-term lithium price unchanged at US\$18,000/t. However, we recognise that this is a relatively conservative price even in the context of just current spot prices and likely real term price rises and we therefore provide a sensitivity analysis of Lepidico's valuation to changes in the long-term, real price of lithium hydroxide in the Sensitivities section below.

## Personnel

With the following three appointments in April, Lepidico has successfully completed the recruitment of its core executive management team. In addition to the below three roles, Lepidico reports that it has also appointed a project director for implementation to start in September, with extensive experience in constructing mid-sized projects, globally. As a result, 25–30% of Lepidico's senior positions have now been filled by women, with only the appointment of the company's general counsel remaining to be filled.

### General manager of operations, United Arab Emirates (UAE)

On 19 April, Lepidico appointed Hans Daniels as general manager of operations, UAE. Mr Daniels has spent the last 13 years of his career in general manager roles in the UAE, the most recent 10 of which were with the Songwon group of chemical companies of South Korea. In 2013, he set up the Songwon-Polysys joint venture in Abu Dhabi and led the construction and subsequent operation of its first chemical manufacturing facility in the region. From 2018, he became the global manager for

Songwon International's Physical Forms Manufacturing Division where, from his Khalifa Industrial Zone Abu Dhabi (KIZAD) manufacturing base, he successfully led projects in Asia, Europe the Middle East and the United States. Prior to his time at Songwon, Mr Daniels was employed by the Cabot Corporation (with expertise in alkali metals), spanning the UAE and Europe . He holds a chemical engineering degree from Haagsche Hogeschool in the Netherlands. All told, Mr Daniels brings 30 years of experience working in the chemicals industry to Lepidico, of which a large portion has been spent in the UAE. As general manager of operations for the region, he will now lead the implementation and operation of Lepidico's Phase 1 chemicals process facility within the KIZAD.

## **General manager of sustainability and country affairs**

On 20 April, Lepidico announced that it had appointed Benedicta Uris as general manager of sustainability and country affairs, Namibia. Ms Uris brings more than 20 years of experience in senior management sustainability roles within the natural resources industries in Africa and the UK to Lepidico. As general manager of sustainability for Lepidico, she will be responsible for designing and implementing the company's sustainability strategy, with an emphasis on environmental, social and governance (ESG) matters, reporting to the managing director, Joe Walsh. Based in Namibia, she will also be responsible for country affairs in the region.

Prior to joining Lepidico, Ms Uris spent the last five years as director of ESG with Dundee Precious Metals at the Tsumeb smelter in Namibia, leading a 65-strong team accountable for corporate social responsibility, health, safety, the environment, community and communications. The role involved the definition and management of corporate social responsibility (CSR) policies and goals and ensuring organisational accountability to itself, stakeholders, the government and the broader community. Prior to her time at Dundee, Ms Uris worked in various health, safety and environment (HSE) roles for Rio Tinto in Africa, including the Rossing mine in Namibia, and for Shell International Petroleum in both Namibia and the UK. She has a master's degree in management with HSE specialisation from the University of Southern Queensland, an MBA from Steinbeis University, Berlin, an advanced diploma in project management from Cranefield College, South Africa and is currently studying an MSc in sustainable development at the University of Sussex.

## **General manager of operations, Namibia**

The next day, on 21 April, Lepidico announced that it had appointed Timotheus (Timo) Ipangelwa as general manager of operations, Namibia. Mr Ipangelwa has 16 years of experience as a mining engineer. As general manager of operations for Lepidico in Namibia, he will lead the re-development of the two open pits at Rubicon and Helikon, as well as implementing Lepidico's Phase 1 mineral concentrator. Most recently, Mr Ipangelwa was employed as mining head for the 120Mtpa Husab open pit mine in Namibia, leading a 520-strong team in a role that involved operational readiness for start-up, recruitment, commissioning and ramp-up to design capacity. Among others, his responsibilities at Husab included management of the earthmoving contracts to a value of approximately US\$300m as well as effective, efficient planning, training and risk management. Prior to joining Husab, Mr Ipangelwa was mining manager for Skorpion Zinc, where he was responsible for mining and technical services.

## **Valuation**

---

### **Assumptions**

In the light of the above considerations, we have made the following adjustments to our financial model of Lepidico:

- We have delayed the implementation of the project by six months.

- We have delayed Lepidico's related equity financing from FY22 to FY23. We have maintained the size of the presumed equity financing at US\$41.8m, or A\$56.5m. However, in common with our normal practice, we have assumed that this will now take place at the prevailing share price of A\$0.028/share (cf A\$0.034/share previously). Note that a sensitivity analysis of Lepidico's valuation to changes in the assumed price of equity funding is provided in the Sensitivities section below.
- We have updated our forex rate from A\$1.3936/US\$ to A\$1.4391/US\$.

## Project

Lepidico's DFS (see [Developing to the \(L-\)Max](#), published on 29 May 2020) calculated a project NPV<sub>8</sub> for the integrated Karibib mining and chemical plant operation of US\$221m, or A\$318m (4.9c/share on a pre-funding basis and 3.6c/share on a post-FY23 equity funding basis) at the current foreign exchange rate of A\$1.4391/US\$.

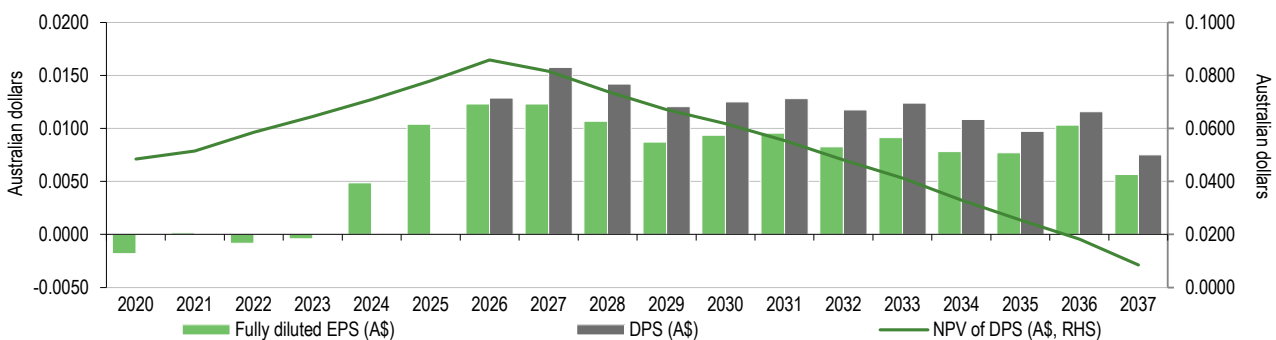
In our report [Gold stars and black holes](#), published in January 2019, we calculated a mean enterprise value for companies with projects at the DFS stage of development of 30.9% of project NPV, ranging up to 133.5%. This alone would imply a pre-funding valuation for Lepidico of 1.5c/share, ranging up to 6.5c/share.

## 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 100% of 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 per year.

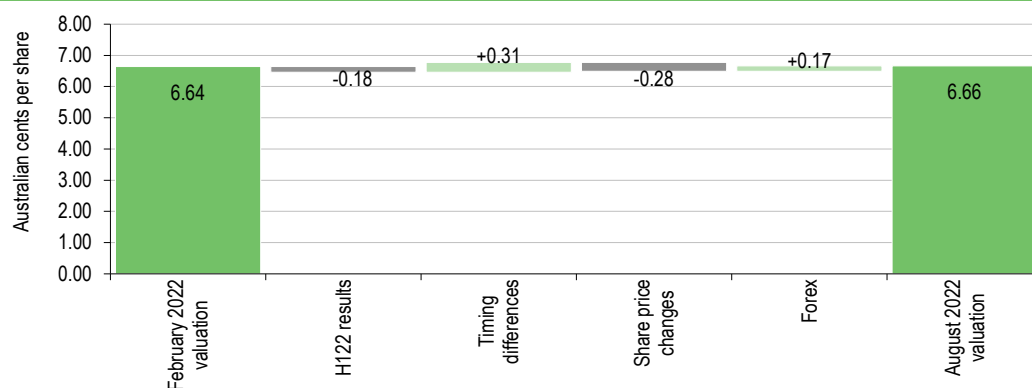
In our last note on the company, we calculated a value for Lepidico's shares of 6.41c plus 0.23c for the value of an envisaged loan to the minority shareholders in the upstream Namibian operation to give a total valuation for the company of 6.64c/share. In the wake of the changes discussed above, our (discounted) valuation of Lepidico's future (maximum potential) dividend stream to shareholders has now increased, albeit modestly, from 6.41c/share to 6.45c/share, rising to a peak of 8.58c/share on the cusp of the company's first material dividend in FY26, as shown in the graph below:

**Exhibit 7: Edison estimate of future Lepidico EPS and (maximum potential) DPS**



Source: Edison Investment Research

To this valuation of 6.45c/share 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 at 0.22c/share (fully diluted), to result in a total value for Lepidico's shares of 6.66c/share (cf 6.64c/share previously), based solely on its Phase 1 project. A 'bridge', showing the major components in the evolution of the valuation from 6.64c/share to 6.66c/share is provided in the graph below.

**Exhibit 8: Lepidico valuation bridge, February 2022 to August 2022**


Source: Edison Investment Research

To this valuation of 6.66c/share may then be added an (updated) potential risk-adjusted 0.63–1.55c/share (fully diluted) for a conceptual 20,000tpa LCE Phase 2 plant, to take the total aggregate conceptual valuation to 7.29–8.21 cents per share.

## Sensitivities

Two of the principal risks to which our valuation of Lepidico is exposed are: 1) the long-term price of lithium hydroxide; and 2) the price at which it raises future equity. The effects of variations in the long-term price of lithium hydroxide from the one currently assumed (US\$18,000/t) are shown in the table below:

**Exhibit 9: Lepidico valuation sensitivity to the long-term price of lithium hydroxide (US\$/t)**

Lithium hydroxide price (US\$/t)	18,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000
Lepidico valuation (Australian cents per share)	6.66	7.22	8.60	9.98	11.36	12.74	14.12	15.50
Change cf 'base case' (%)	u/c	+8.4	+29.2	+50.2	+70.9	+91.9	+112.8	+133.6

Source: Edison Investment Research

Within this context, readers should note that our valuation of Lepidico, based on its Phase 1 Plant project alone, is significantly more sensitive to changes in the long-term price of lithium hydroxide than it is to changes in capex assumptions. For each 10% by which capex increases above our base case scenario, our valuation of Lepidico declines by 0.19c (or, initially, 2.8%), whereas for each 10% by which the lithium hydroxide price exceeds our base case scenario, our valuation increases by 0.50c (or, initially, 7.5%).

In the meantime, our financial model assumes that Lepidico will raise US\$41.8m/A\$56.5m (gross) in FY23 at a share price of 2.8c (cf 3.4c previously) and Exhibit demonstrates the sensitivity of our valuation to variations in this assumption, as follows:

**Exhibit 10: Lepidico valuation sensitivity to future equity funding price (Australian cents per share)**

Equity funding price	2.00	2.80	2.90	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.86
Lepidico valuation	6.09	6.66	6.72	6.77	7.00	7.17	7.32	7.44	7.54	7.63	7.70	7.77	7.86

Source: Edison Investment Research

Note that it is possible that Lepidico may choose to source all (or a portion) of this future equity funding requirement from a strategic partner after debt funding has already been secured, in which case it is possible/likely that a higher equity price than that currently prevailing could be supported. Alternatively, it may raise less than our assumptions suppose. Our financial model is currently calibrated to achieve a future (project) maximum net debt:equity ratio of 70:30, which corresponds to a (company) maximum net debt:equity ratio of 54:46. However, in FY22 Lepidico raised c A\$7.4m via the exercise of warrants, which was not originally incorporated into our model and

could conceivably contribute to the company's equity funding requirements. In addition, the US Department of Energy will now perform due diligence on any projects to be located in the United States (complementing the work currently being undertaken on Lepidico by the US International Development Finance Corporation) which, if successful, could open up the possibility of debt funding up to 80% of the project's total. Within this context, we calculate that:

- achieving a maximum company leverage ratio of 66:34 debt:equity (cf 54:46) would require Lepidico to raise only A\$27.5m (cf A\$56.5m), in which case our valuation increases from 6.66c/share to 7.00c/share; and
- achieving a maximum (project) leverage ratio of 80:20 debt: equity (cf 70:30) would require Lepidico to raise only A\$40.7m, in which case our valuation increases from 6.66c/share to 6.97c/share.

**Exhibit 11: Financial summary**

Accounts: IFRS; year end June; A\$000s	2018	2019	2020	2021	2022e	2023e
<b>PROFIT &amp; LOSS</b>						
Total revenues	171	2	47	4,137	44	0
Cost of sales	0	0	0	0	0	0
Gross profit	171	2	47	4,137	44	0
SG&A (expenses)	(5,284)	(4,006)	(4,904)	(3,398)	(4,001)	(3,146)
Other income/(expense)	0	0	0	0	0	0
Exceptionals and adjustments	(2,171)	(1,150)	(2,740)	(338)	(1,823)	0
Depreciation and amortisation	(6)	(8)	(1,208)	(713)	(354)	(354)
Reported EBIT	(7,290)	(5,162)	(8,805)	(311)	(6,133)	(3,500)
Finance income/(expense)	70	57	17	0	(88)	53
Other income/(expense)	0	0	0	0	0	0
Exceptionals and adjustments	0	0	(2,026)	0	0	0
Reported PBT	(7,220)	(5,105)	(10,814)	(311)	(6,221)	(3,447)
Income tax expense (includes exceptionals)	0	0	696	593	112	0
Reported net income	(7,220)	(5,105)	(10,118)	283	(6,109)	(3,447)
Basic average number of shares, m	2,624	3,272	4,568	5,218	6,330	7,516
Basic EPS (c)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)
<b>BALANCE SHEET</b>						
Property, plant and equipment	27	20	1,904	1,669	1,470	56,256
Goodwill	0	0	0	0	0	0
Intangible assets	19,027	22,925	23,870	24,631	31,857	31,857
Other non-current assets	730	27,469	42,798	44,058	44,058	44,058
Total non-current assets	19,783	50,414	68,573	70,358	77,386	132,172
Cash and equivalents	4,860	13,660	4,793	14,738	14,738	14,738
Inventories	0	0	0	0	0	0
Trade and other receivables	712	1,869	1,767	244	122	0
Other current assets	0	0	0	0	0	0
Total current assets	5,572	15,529	6,560	14,982	14,860	14,738
Non-current loans and borrowings	0	3,276	5,215	0	4,097	6,072
Other non-current liabilities	0	0	10,055	9,283	9,283	9,283
Total non-current liabilities	0	3,276	15,271	9,283	13,380	15,355
Trade and other payables	804	10,940	565	968	613	259
Current loans and borrowings	0	0	0	0	0	0
Other current liabilities	51	86	108	140	140	140
Total current liabilities	856	11,026	672	1,108	753	399
Equity attributable to company	24,500	53,252	52,404	68,314	71,591	124,635
Non-controlling interest	0	(1,610)	6,785	6,636	6,521	6,521
<b>CASH FLOW STATEMENT</b>						
Profit for the year	(7,220)	(5,105)	(10,118)	283	(6,109)	(3,447)
Taxation expenses	0	0	(696)	(593)	(112)	0
Depreciation and amortisation	6	8	1,208	713	354	354
Share based payments	2,138	520	1,027	338	1,823	0
Other adjustments	2,066	664	4,716	(497)	0	0
Movements in working capital	(28)	410	(1,509)	201	(233)	(233)
Income taxes paid	0	0	696	593	112	0
Cash from operations (CFO)	(3,038)	(3,504)	(4,676)	1,037	(4,166)	(3,326)
Capex	(3,057)	(6,251)	(7,452)	(550)	(7,381)	(55,140)
Acquisitions & disposals net	110	0	416	0	0	0
Cash used in investing activities (CFIA)	(2,947)	(6,251)	(7,036)	(550)	(7,381)	(55,140)
Net proceeds from issue of shares	7,555	18,462	3,523	14,707	7,450	56,491
Movements in debt	0	0	0	(5,176)	4,097	1,975
Cash from financing activities (CFF)	7,555	18,462	3,523	9,531	11,547	58,466
Increase/(decrease) in cash and equivalents	1,570	8,707	(8,190)	10,017	0	0
Currency translation differences and other	(17)	93	(678)	(72)	0	0
Cash and equivalents at end of period	4,860	13,660	4,793	14,738	14,738	14,738
Net (debt)/cash	4,860	10,385	(422)	14,738	10,641	8,666
Movement in net (debt)/cash over period	1,553	5,525	(10,807)	15,160	(4,097)	(1,975)

Source: Lepidico accounts, Edison Investment Research

---

## 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 £60,000 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 2022 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  
1185 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