# **European Lithium Limited**

Australia / Mining Frankfurt, Sydney Bloomberg: PF8 GR ISIN: AU000000EUR7

Comprehensive Update

RATING	BUY
PRICE TARGET	€ 0.17
Return Potential	142.9%
Risk Rating	High

# **IMMINENT DFS TO OPEN DOOR TO OFFTAKE DEALS AND FINANCING**

Existing and planned European battery factories are expected to generate over 600,000 tonnes of lithium carbonate equivalent demand in 2025 - the year when we expect European Lithium to be ramping up production at its Wolfsberg Lithium Project in Austria. In December last year European Lithium published an updated resource estimate showing 9.74m measured and indicated (M+I) tonnes at an average grade of 1.03% Li<sub>2</sub>O. At over 100,000 tonnes, the current M+I in situ resource is 36% above the equivalent figure implied by the previous 2017 resource estimate. The updated M+I resource estimate will be the basis for the definitive feasibility study (DFS), publication of which is expected in Q2. We expect the DFS to open the door to offtake deals and financing. We model combined CAPEX for the mine and lithium hydroxide converter facility at ca. USD500m, with financing split 20/40/40 between grants, equity and debt. Based on a conservative average lithium hydroxide price assumption of USD25,000 per tonne (the current price is over USD70,000) over a fifteen year mine life, we see fair value for the share at €0.17. Our recommendation is Buy.

Low environmental footprint suggests authorities will greenlight project Ore crushing, screening and sorting as well as production of a spodumene concentrate will take place in or very close to the mine, thereby minimising material transport from the mine to the converter. The crushed and sorted ore will be transported most of the distance between the mine and the conversion facility by rail. All wheeled transport both inside and outside the mine will be electric. Waste rock from ore crushing and sorting will be deposited in mined out stopes within the mountain. No chemicals will be used at the mine site. In addition, operations at the mine site will not be visible from local tourism sites.

**Potential to further expand the resource** The 2017 and 2021 resource estimates are based solely on Zone 1 of the Wolfsberg deposit. Zone 2 is thought to "mirror" Zone 1. It is likely that further M+I resource will be delineated at both Zone 1 and Zone 2 once production of the Zone 1 resource starts.

# **FINANCIAL HISTORY & PROJECTIONS**

	2020/21A	2021/22E	2022/23E	2023/24E	2024/25E	2025/26E
Revenue (A\$ m)	0.03	0.07	0.07	0.07	59.46	297.28
Y-o-y growth	n.a.	114.8%	1.2%	4.5%	n.a.	400.0%
EBIT (A\$ m)	-3.66	-13.45	-5.38	136.62	25.41	140.00
EBIT margin	n.a.	n.a.	n.a.	n.a.	42.7%	47.1%
Net income (A\$ m)	-3.96	-13.48	-5.35	137.03	-2.76	86.98
EPS (diluted) (A\$c)	-0.50	-1.17	-0.41	4.16	-0.08	2.62
DPS (A\$)	0.00	0.00	0.00	0.00	0.00	0.00
FCF (A\$ m)	-5.80	-17.39	-5.26	-199.06	-331.94	128.70
Net gearing	-12.8%	-3.5%	-13.1%	-17.0%	56.4%	23.4%
Liquid assets (A\$ m)	5.42	1.45	6.19	217.12	25.18	153.88

# **RISKS**

If the ongoing penetration of the automotive market by electric vehicles slows or comes to a halt, the lithium price is likely to fall.

# **COMPANY PROFILE**

European Lithium is a mining exploration and development company focusing on its wholly owned Wolfsberg Lithium Project in Austria. The company targets the commencement of production of lithium hydroxide for battery factories from end 2024.

MARKET D	ATA	As of	17 Mar 2022		
<b>Closing Price</b>		€ 0.07			
Shares outsta	Inding		1151.90m		
Market Capita	lisation	€ 80.63m			
52-week Rang	ge	€ 0.03 / 0.12			
Avg. Volume	(12 Months)	686,846			
Multiples	2020/21A	2021/22E	2022/23E		
P/E	n.a.	n.a.	n.a.		
EV/Sales	3613.3	1682.1	1662.7		
EV/EBIT	n.a.	n.a.	n.a.		

0.0%

0.0%

0.0%

# **STOCK OVERVIEW**

Div. Yield



COMPANY DATA	As of 31 Dec 2021
Liquid Assets	A\$ 9.34m
Current Assets	A\$ 10.01m
Intangible Assets	A\$ 41.43m
Total Assets	A\$ 52.05m
Current Liabilities	A\$ 1.13m
Shareholders' Equity	A\$ 50.92m

# **SHAREHOLDERS**

Dempsey Resources Pty Ltd.	5.6%
Millstone and Co. Global DW LLC	4.6%
Battle Mountain Pty Ltd	3.5%
Winance Ltd	0.9%
Free float and other	85.5%

**Updated resource estimate will be basis for DFS** In early December 2021 European Lithium (EUR) published an updated resource estimate (see figure 1 below) based on infill drilling carried out at Zone 1 of the Wolfsberg Lithium Project (WLP). The infill drilling programme began during the financial year 2018/19 and was completed in August 2021. It comprised 20 drill holes and produced 9,953m of core. The updated resource estimate will be the basis for the definitive feasibility study (DFS), publication of which is scheduled by the end of the current quarter. The updated resource estimate supersedes the July 2017 resource estimate which was the basis for the prefeasibility study (PFS) published in April 2018.

Date	Code	Туре	Million tonnes Li <sub>2</sub> O	Grade	Tonnes in situ Li <sub>2</sub> O
July 2017	<b>JORC 2012</b>	Measured	2.86	1.28%	36,608
		Indicated	3.44	1.08%	37,152
		M+I	6.30	1.17%	73,760
		Inferred	4.68	0.78%	36,504
		Total	10.98	1.00%	110,264
December 2021	<b>JORC 2012</b>	Measured	4.31	1.13%	48,737
		Indicated	5.43	0.95%	51,585
		M+I	9.74	1.03%	100,322
		$\Delta$ vs. July 2017	54.7%	-12.1%	36.0%
		Inferred	3.14	0.90%	28,242
		Total	12.88	1.00%	128,564
		$\Delta$ vs. July 2017	17.3%	0.0%	17.3%

Figure 1: 2017 and 2021 resource estimates for Wolfsberg Lithium Project

Source: European Lithium Limited

**Updated resource estimate implies 36% increase of in situ Li<sub>2</sub>O** Life of mine output of lithium hydroxide monohydrate in both the PFS and the DFS is based solely on measured and indicated resources. The PFS described two development plans for the WLP - the Base Case and the Accelerated Case. The two cases respectively stipulated output of 100,737 tonnes of lithium hydroxide monohydrate over a 12 year minelife and 101,287 tonnes of lithium hydroxide monohydrate over a 10 year minelife. As figure 2 shows, in situ measured and indicated tonnage of 103.2k tonnes in the current resource estimate is 36% above the figure of 73.7k tonnes in the July 2017 resource estimate. In our valuation model, we assume output of 136.8k tonnes (35% above the figure in the Accelerated Case) over a 15 year mine life.

Wolfsberg Zone 1 and Zone 2 offer exploration upside The 2017 and 2021 resource estimates are based solely on the northern limb of the mineralised anticline at the WLP (Zone 1 of the deposit). The southern flank of the anticline (known as Zone 2) is also a prospective area thought to "mirror" Zone 1. This thesis is supported by the occurrence of mineralised pegmatite boulders and exactly the same lithology as Zone 1. EUR drilled the first three drill holes of a planned 9 drill hole programme in Zone 2 in late spring/early summer 2017. Hole P15-1, the furthest from the hinge of the anticline, did not intersect pegmatites. But as figure 2 shows, holes P15-5 and P15-6 showed wide intersections of spodumene-rich pegmatites. The Zone 2 drilling programme was suspended during summer 2017 due to funding constraints but resumed in February 2018 on the basis of the funds raised through a capital increase in November 2017. Five drill holes were completed in Zone 2 during Q1 2018, four of which showed multiple pegmatite intersections (see figure 3). Vein thicknesses and grades were similar to those seen in Zone 1. EUR management have indicated that in the medium term the drill data from the 2017/18 programme and also from three holes drilled in 2012 will contribute to production of a maiden resource estimate for Zone 2. However, further work on Zone 2 is unlikely until after the start of mining of the Zone 1 deposit. As stated above, it is likely that further M+I resource will be delineated at both Zone 1 and Zone 2 once production of the Zone 1 resource starts.

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Drill Hole ID	Composite from (m)	Composite to (m)	Composite width (m)	Measured dip angle (°)	True thickness (m)	Composited % Li <sub>2</sub> O	Composite mineralised (m)	Mineralised % Li <sub>2</sub> O
P15-5	22.70	23.40	0.70	40	0.54	1.16	0.54	1.16
P15-5	47.60	48.40	0.80	40	0.61	1.87	0.61	1.87
P15-5	70.96	73.83	2.87	30	2.49	1.76	2.27	1.92
P15-5	132.35	136.38	4.03	35	3.38	1.45	3.38	1.45
P15-6	70.08	71.43	1.35	65	0.57	1.22	0.57	1.22
P15-6	83.84	88.77	4.93	53	2.97	1.23	2.38	1.52
P15-6	100.68	101.48	0.80	55	0.46	0.51	0.46	0.51
P15-6	106.50	117.40	10.75	60	5.38	0.82	3.88	1.10
P15-6	143.30	143.86	0.56	65	0.24	0.60	0.24	0.60
P15-6	167.70	169.01	1.31	60	0.66	0.41	0.66	0.41
P15-6	186.70	197.20	10.50	60	5.25	0.98	3.99	1.26

# Figure 2: Composite\* true widths and lithium assays from first three Zone 2 drill holes (published June 2017)

\* best composites are highlighted

# Source: European Lithium

Figure 3: Pegmatite intersection widths\* and calculated true thicknesses with composite grades from five Zone 2 drill holes completed during Q1 2018 (published April 2018)

Drill Hole ID	Pegmatite	Pegmatite to	Measured	Measured dip	True thickness	Li₂O %
	from (m)	(m)	thickness (m)	angle (°)	(m)	
P15-3	18.50	19.05	0.55	30	0.47	1.50
P15-3	19.85	20.20	0.35	30	0.30	1.27
P15-3	32.20	33.00	0.80	55	0.46	0.95
P15-3	46.00	50.00	4.00	65	1.69	1.90
P15-3	52.85	61.00	8.15	30	7.05	0.58
P15-3	132.00	133.10	1.10	70	0.40	1.21
P15-3	151.70	152.65	0.95	75	0.25	0.83
P15-3	185.20	186.10	0.90	70	0.32	1.00
P15-3	235.85	238.05	2.20	10	2.16	1.36
P15-7	17.70	21.28	3.58	20	3.36	1.10
P15-7	25.10	25.70	0.60	45	0.42	0.59
P15-7	214.75	217.50	2.75	30	2.38	1.08
P15-8	24.32	27.04	2.72	50	1.75	1.63
P15-8	28.92	29.40	0.48	40	0.37	2.44
P15-8	161.30	162.90	1.60	35	1.31	0.80
P15-8	174.50	175.70	1.20	30	1.03	1.15
P15-5b	135.00	135.75	0.75	35	0.61	0.85
P15-5b	159.30	160.40	1.10	25	1.00	0.71
P15-5b	204.45	205.90	1.45	10	1.43	1.91
P15-5b	217.35	218.45	1.10	20	1.03	1.28
P15-5b	260.10	260.95	0.85	35	0.70	2.49
P15-5b	261.65	264.15	2.50	30	2.16	1.06
P15-5b	268.12	268.57	0.45	30	0.39	0.84
P15-5b	298.10	298.55	0.45	20	0.42	0.24

\* best intersections are highlighted

Source: European Lithium

The WLP comprises 54 exploration licences and a mining licence for 11 mining areas. All licenses were issued by the Austrian mining authority. The exploration licenses cover a total non-overlapping area of 1,133 hectares with part of this same area covered by the 11 mining licenses which total 52.8 hectares. The exploration licences have been extended until 31 December 2024 and the mining licences can be held in perpetuity provided their conditions are maintained.

**Metallurgical testing based on samples from 1,000 tonne ore stockpile** The mining licenses were originally granted in 2011 and allowed EUR to extract bulk samples which were used in recently completed metallurgical testing work. The bulk samples were collected from stockpiles of ore (70mm) obtained from underground mining activities conducted during 2013. Approximately 500 tonnes of ore from each host material (amphibolite, mica schist) were mined.

Bulk samples of each material type were composited from 50 one tonne samples taken along the length of the stockpiles for representative metallurgical testing. EUR contracted the German-based independent consultant, Anzaplan, to carry out a series of tests using the bulk samples to provide information for use in the DFS.

Test work included the following:

- · Sensor-based ore sorting tests to minimise dilution of ore into a process plant
- Pilot test work to understand the physical processing characteristics of the ore into a spodumene concentrate product
- Settling and filtration tests
- Gravity separation techniques for mica removal
- Hydrometallurgical tests for conversion of spodumene concentrate into a lithium carbonate product
- Conversion tests for production of lithium hydroxide from lithium carbonate to determine recoveries and end product specifications

**WLP can produce battery grade product** Results announced in early December 2021 demonstrated that battery grade lithium carbonate or lithium hydroxide can be produced from the WLP. Anzaplan compared end quality product results against a series of German Industry Norm specifications. These specifications were derived from a cross section of Anzaplan's experiences with end users in lieu of a definitive industry standard which currently does not exist. Figures 4 and 5 below show that all impurities are below specification in production of both lithium carbonate and lithium hydroxide.

# Figure 4: Lithium hydroxide certificate of analysis

Parameter		LIMS-1D Norm	20-21343 20-23026 21-02200 Lithium Hydroxide	Specification Lithium Hydroxide
В	1	DIN EN ISO 11885-E22 2009-09	1.4 mg/kg	10 mg/kg
Na	1	DIN EN ISO 11885-E22 2009-09	6.9 mg/kg	50 mg/kg
Si	1	DIN EN ISO 11885-E22 2009-09	6.8 mg/kg	30 mg/kg
S04	1	DIN EN ISO 10304-1 2009-07	13 mg/kg	100 mg/kg
CI	1	DIN EN ISO 10304-1 2009-07	<10 mg/kg	20 mg/kg
К	1	DIN EN ISO 11885-E22 2009-09	1.6 mg/kg	30 mg/kg
Са	1	DIN EN ISO 11885-E22 2009-09	1.9 mg/kg	10 mg/kg
Fe	1	DIN EN ISO 11885-E22 2009-09	1.1mg/kg	7 mg/kg
CO <sub>2</sub>	4	QMA-293 2021-09	<0.01 wto/c	0.4 wt%

Source: European Lithium, Anzaplan

18	March	2022

Parameter		LIMS-1D Norm	19-18024 Lithium Carbonate sample EL 10 kg	Specification Lithium Carbonate Li <sub>2</sub> CO <sub>3</sub>
Li <sub>2</sub> CO <sub>3</sub>	1	DIN EN ISO 11885-E22 2009-09	99.6 wt%	>99.5 wt%
Na	1	DIN EN ISO 11885-E22 2009-09	22 mg/kg	<250 mg/kg
Mg	1	DIN EN ISO 11885-E22 2009-09	1.5 mg/kg	<80 mg/kg
AI	1	DIN EN ISO 10304-1 2009-07	6.4 mg/kg	<10 mg/kg
Si	1	DIN EN ISO 10304-1 2009-07	3.9 mg/kg	<30 mg/kg
К	1	DIN EN ISO 11885-E22 2009-09	2.0 mg/kg	<10 mg/kg
Ca	1	DIN EN ISO 11885-E22 2009-09	22 mg/kg	<50 mg/kg
Fe	1	DIN EN ISO 11885-E22 2009-09	1.1 mg/kg	<10 mg/kg
Cu	1	DIN EN ISO 11885-E22 2009-09	<1 mg/kg	<10 mg/kg
CI	1	DIN EN ISO 10304-1 2009-07	<30 mg/kg	<30 mg/kg
S04	1	DIN EN ISO 11885-E22 2009-09	700 mg/kg	<800 mg/kg

# Figure 5: Lithium carbonate certificate of analysis

Source: European Lithium, Anzaplan

The forthcoming DFS will consist of three parts: accessing and mining the ore; ore processing and conversion into the lithium hydroxide end-product; the groundwork for the ensuing permitting process which will mainly address environmental issues.

**Resolution of dispute with landowner** Ahead of publication of the DFS management has resolved a dispute with the owner of the land on which the WLP is located and also largely allayed the environmental concerns of the local communities. The landowner is Glock Gutund Forstverwaltung GmbH (Glock Land and Forestry Administration GmbH), which is controlled by the well-known pistol manufacturer, Glock GmbH. In 2011 Glock and EUR's Austrian subsidiary, ECM Lithium, concluded an agreement whereby Glock waived any right to object to the development of an underground mine on its property. However in 2016, Glock withdrew its agreement and both parties proceeded to arbitration. A final settlement allowing EUR to continue developing the WLP was reached in Q2/21. In order to reach this settlement, EUR agreed to construct a new entrance to the mine at a location which is still to be determined but which will not be on Glock land. The new mine entrance will be located so as not to be visible from the nearby Weinebene, which is a popular recreational and hiking area. EUR also granted Glock the option to take a future stake in the mine.

**Management has moved to allay local communities' environmental concerns** Representatives of several of the communities in the vicinity of the WLP in the federal state of Styria have voiced concerns that the project threatens their drinking and spring water. In the course of reaching the settlement with Glock, an expert clarified that there is no risk to the groundwater and spring water of communities in Styria, as the lithium deposit is located on the other side of the Koralpe mountain range which separates Styria from the federal state of Carinthia.

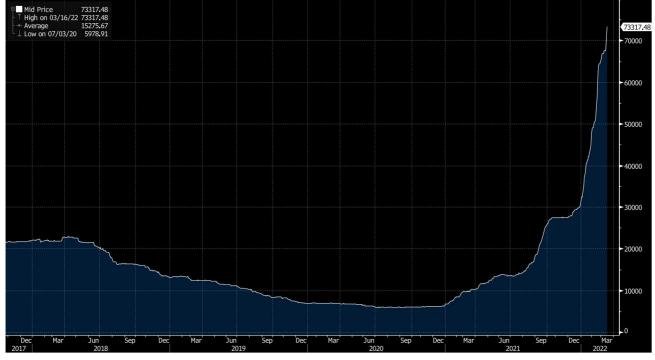
EUR's CEO Dietrich Wanke has addressed other environmental concerns with respect to the project as follows:

• Ore crushing, screening and sorting will take place in the mine while spodumene concentrate will be produced at a site very close to the mine entrance. This will minimise transport of material from the mine to the lithium hydroxide conversion facility site. The location of the conversion facility is expected to be some 20 km from the mine.

- The crushed and sorted ore will be transported most of the distance between the mine and the conversion facility by rail.
- All wheeled transport both inside and outside the mine will be electric.
- Waste rock from ore crushing and sorting will be deposited in mined out galleries within the mountain. Hence the countryside surrounding the mine will not be disfigured by unsightly rock dumps.
- Ore transporting containing trucks will make only ten round trips between the mine and the railhead every day.

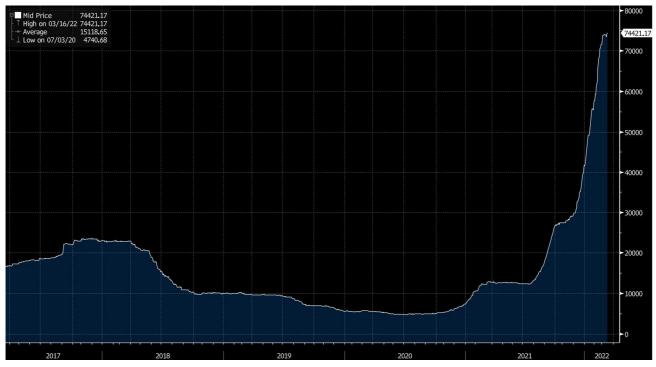
As figures 6 and 7 show, the two main lithium commodities - lithium hydroxide and lithium carbonate - are currently trading at roughly 3x the previous all-time highs reached in 2018.





Source: Bloomberg





Source: Bloomberg

Figure 8: Electric vehicle unit sales by market 2017-21(000's)

	2017A	2018A	2019A	2020A	2021A
Europe	300	410	589	1,401	2,332
% change	50.0%	36.7%	43.7%	137.9%	66.5%
absolute change	100	110	179	812	931
China	700	1,161	1,196	1,331	3,396
% change	75.0%	65.9%	3.0%	11.3%	155.1%
absolute change	300	461	35	135	2,065
USA	200	359	316	375	680
% change	0.0%	79.5%	-12.0%	18.7%	81.3%
absolute change	0	159	-43	59	305
Other	100	152	175	133	342
% change	233.3%	52.0%	15.1%	-24.0%	157.1%
absolute change	70	52	23	-42	209
Total	1,300	2,082	2,276	3,240	6,750
% change	<b>56.6%</b>	<b>60.2%</b>	<b>9.3</b> %	42.4%	108.3%
absolute change	470	782	194	<b>96</b> 4	3,510
% change	<b>46.9%</b>	<b>66.4%</b>	-75.2%	<b>396.9%</b>	<b>264.</b> 1%
Share of light vehicle sales	1.4%	2.2%	2.5%	4.2%	8.3%

Source: EVvolumes.com; IEA

**EV-related lithium demand growth reached an inflection point in 2021** Lithium commodity prices have exploded because demand for electric vehicle (EV) batteries has passed through an inflection point. We estimate that the EV market accounted for over 80% of the growth in lithium demand in 2021. As figure 8 shows, the EV market grew by 3.5m units last year. Annual growth had previously never exceeded 1m units. Unsurprisingly, the supply side has been unable to keep up.

**Emergence of large selection of attractive EVs has been decisive for growth** Government automotive electrification targets, subsidies and emissions control regulations remain a key driver for EV markets. The automotive industry has also become increasingly active in terms of targets and model launches. Volkswagen expects half of its sales to be electric by 2030. Meanwhile Ford has set a target of 40%-50% and Toyota aims to achieve electric car sales of 3.5 million a year by the same date. However, the biggest reason for the lift-off in EV sales is the increasing availability of attractive vehicles. After years of displaying concept models at motor shows, car manufacturers now offer whole suites of electric vehicles from small city runabouts to larger family cars. Dozens more are planned for the next few years. Many EVs are still more expensive than the internal combustion engine alternatives but are substantially cheaper to run against the backdrop of elevated petrol prices. In addition most governments still offer generous purchase incentives. Over 300 pure electric or hybrid models are currently available compared with under 100 five years ago. 2021 market growth and the announcements and product launches outlined above strengthen our view that the future of cars is electric.

In 2021 chip shortages and rising prices for aluminium (+38%), copper (+24%), nickel (+20%) and steel (+40%) placed the automotive supply chain under great stress. This issue has been exacerbated by the Russian invasion of the Ukraine. Since 24 February prices for aluminium copper and steel have risen between 3% and 15% and the nickel price has jumped by over 90%.

We do not expect inflation/stagflation to substantially slow market growth Inflation and possibly stagflation caused by the commodity price rises may slow EV adoption in 2022, but we do not expect it to substantially slow electrification of the automotive market during the rest of the decade. As figure 9 overleaf shows, we forecast that EVs will account for 57% of the global passenger vehicle market by 2030.

	2020A	2021A	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	CAGR 2021-30
No. EVs sold	3,240	6,750	8,250	13,333	17,640	21,938	27,200	32,760	39,100	43,829	48,450	24.5%
% change	42.4%	108.3%	54.1%	44.2%	40.0%	28.6%	25.9%	23.5%	21.4%	15.7%	15.3%	-
Absolute change	964	3,510	3,650	4,600	6,000	6,000	7,000	8,000	9,000	8,000	9,000	11.0%
Share of total passenger cars	4.2%	8.3%	10.0%	16.0%	21.0%	26.0%	32.0%	39.0%	46.0%	52.0%	57.0%	-

Source: First Berlin Equity Research estimates

**Installation of lithium-based new energy storage capacity doubled in 2021** In 2022 the two most important uses for lithium products will be EV batteries, followed by energy storage installations. The consultant Bloomberg New Energy Finance (BNEF) defines the latter as stationary batteries used in ancillary services, energy shifting, deferral of investment in transmission and distribution grids, customer-sited, and other applications but does not include pumped hydro storage. Last year saw the addition of 12 GW of new energy storage capacity taking the installed base to 29 GW. Only 5 GW was added in 2020. Investments in energy storage solutions are typically coupled with renewable energy investments – their main function being to smooth out the fluctuations in power generation associated with renewables. In 2020 lithium ion battery technology accounted for 93% of the total energy storage mix. Technology transfer from the development of EV batteries is expected to strengthen lithium ion's market share in coming years. BNEF forecast that the global energy storage market will reach a cumulative 358 gigawatts by the end of 2030, more than twelve times larger than the 29 gigawatts online at the end of 2021.

## Figure 10: Forecast development of global energy storage market to 2030 (GW)

	2020A	2021A	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	CAGR 2021-30
Year-end installed base	17	29	48	70	95	124	160	200	245	300	358	32.2%
New installations	5	12	19	22	25	29	36	40	45	55	58	19.1%
% change	42.4%	108.3%	54.1%	44.2%	40.0%	28.6%	25.9%	23.5%	21.4%	15.7%	15.3%	-
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Source: Bloomberg New Energy Finance

**We forecast 2021-30 CAGR of 25.9% for lithium carbonate equivalent demand** Our forecasts for the EV and energy storage markets produce the forecast for worldwide lithium demand shown in figure 11. The compound annual growth rates (CAGRs) for new energy storage installations and associated lithium demand are very close to each other at 19.1% and 20.1% respectively. The divergence between the CAGRs for EV sales (24.5%) and lithium demand from the EV market (31.8%) stems from the expectation of an increase in average EV battery size.

	2020A	2021A	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	CAGR 2021-30
Batteries - EVs	137	246	312	568	822	1,111	1,422	1,791	2,216	2,580	2,958	31.8%
change (%)	31.7%	79.7%	26.9%	81.8%	44.8%	35.0%	28.0%	26.0%	23.7%	16.4%	14.7%	-
Non-EV batteries/other	63	100	158	183	208	241	299	336	378	468	516	20.1%
change (%)	21.2%	58.1%	58.3%	15.8%	13.6%	16.0%	24.1%	12.4%	12.5%	23.7%	10.4%	-
Industrial usage	104	107	109	111	114	116	118	120	123	125	128	2.0%
change (%)	-3.7%	2.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-
Total	304	453	579	862	1,143	1,467	1,839	2,247	2,717	3,173	3,602	25.9%
change (%)	15.2%	48.9%	27.9%	48.8%	32.6%	28.3%	25.3%	22.2%	20.9%	16.8%	13.5%	-

# Figure 11: Forecast worldwide LCE\* demand to 2030 (000 tonnes)

\* lithium carbonate equivalent. 1 tonne LCE = 1.14 tonnes lithium hydroxide, 0.40 tonnes lithium oxide

## Source: First Berlin Equity Research estimates

It will be challenging for lithium miners to keep pace with demand Our lithium demand forecast implies incremental demand of over 1 million tonnes LCE over the period 2021-25. Lithium miners are responding. The consultant S&P Global Platts has compiled a list of projects (see figure 12) in an advanced stage of construction with a total capacity of 1.3m tonnes LCE. Under ideal circumstances and if perfectly executed, these projects can reach full nameplate capacity by 2025 at the latest.

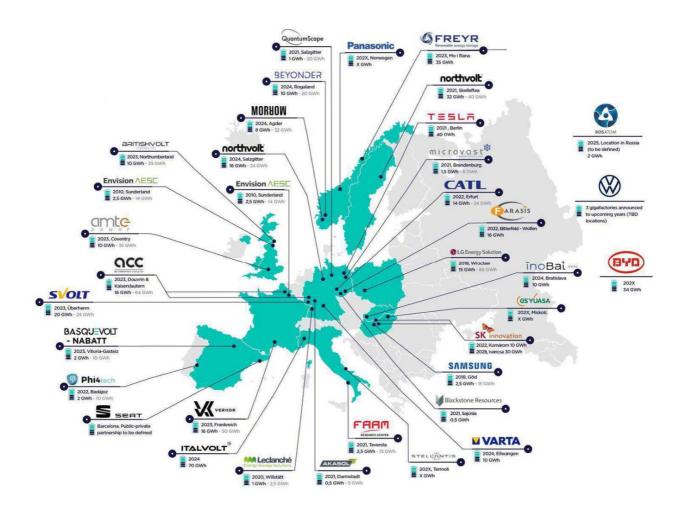
# Figure 12: Advanced stage lithium projects

Project	Company	Country	Nameplate capacity LCE 000 tonnes	Product	Asset
Sal de Vida	Galaxy/POSCO	Argentina	25,000	Lithium carbonate	Brine
Cauchari Olaroz	Lithium Americas	Argentina	40,000	Lithium carbonate	Brine
Pozuelos	POSCO	Argentina	2,500	Lithium carbonate	Brine
Salaer de Hombre Muerto	Livent	Argentina	60,000	Lithium carbonate	Brine
Salar de Olaroz	Orocobre/Toyota Tsusho/Jujuy	Argentina	42,500	Lithium carbonate	Brine
Salar de Atacama/Salar de Carmen	SQM	Chile	180,000	Lithium carbonate	Brine
Salar de Vida Extension	Galaxy/Korea Res./GS Caltex/LG	Argentina	25,000	Lithium carbonate	Brine
Finniss	Core Lithium	Australia	26,000	Spodumene	Hard rock
Mt Holland	Wesfarmers	Australia	44,000	Spodumene	Hard rock
Greenbushes	Albemarle/Mineral Resources	Australia	260,000	Spodumene	Hard rock
Grota do Cirilo	Sigma Lithium	Brazil	65,000	Spodumene	Hard rock
Mount Marion	Mineral Resources	Australia	59,000	Spodumene	Hard rock
Pilgangoora	Pilbara	Australia	105,000	Spodumene	Hard rock
Mibra	AMG	Brazil	170,000	Spodumene	Hard rock
Wodgina	Albemarle/Mineral Resources	Australia	99,000	Spodumene	Hard rock
Ngungaju	Pilbara	Australia	25,000	Spodumene	Hard rock
Salar de Atacama	Albemarle	Chile	80,000	Lithium carbonate	Brine

Source: S&P Global Platts; company announcements

The S&P Global Platts analysis is based on companies' announcements and considers the best case scenario in which a) projects are completed on time b) achieve fast-track ramp-up and permitting. c) meet the required product quality. In practice all these conditions are challenging and delays are frequent. We thus think that there is a high probability that the market will remain undersupplied with lithium until at least 2025.





Source: CICenergiGUNE

	Company	Production	GWh/a	Investment	Jobs
	Company	start	capacity	€m	JODS
1	Tesla	2022	120.0	5,000	2,000
2	LG Energy	2018	65.0	2,800	1,800
3	Northvolt	2023	60.0	4,000	3,000
4	Samsung SDI	2018	50.0	1,200	4,500
5	Italvolt	2024	45.0	4,000	4,000
6	Freyr	2023	43.0	4,500	1,500
7	Morrow	2023	42.0	470	2,000
8	Envision	2024	38.0	1,185	6,000
9	ACC	2023	32.0	2,600	2,000
10	ACC	2025	32.0	2,168	2,000
11	British Volt	2023	30.0	2,960	3,000
12	SK Innovation	2028	30.0	1,980	2,500
13	Envision	2024	24.0	2,000	n.a.
14	VW	2024	24.0	1,300	1,000
15	SVOLT	2023	24.0	1,700	2,000
16	CATL	2022	24.0	1,800	2,000
17	QuantumScape	n.a.	21.0	n.a.	n.a.
18	SK Innovation	n.a.	17.0	1,069	1,410
19	Verkor	2023	16.0	1,600	n.a.
20	ElevenEs	n.a.	16.0	n.a.	n.a.
21	Basquevolt	2025	10.0	1,200	n.a.
22	Phi4tech	n.a.	10.0	400	500
23	Varta	2023	10.0	n.a.	n.a.
24	Farasis	2024	10.0	40	n.a.
25	inobai	n.a.	10.0	100	150
26	FAAM	2021	8.0	505	n.a.
27	Rosatom	2026	3.0	n.a.	2,000
28	Leclanché	2021	2.5	48	n.a.
29	Amte	n.a.	2.0	n.a.	n.a.
30	Phi4tech	2021	2.0	80	150
31	Bollore	2012	0.8	n.a.	n.a.
32	Blackstone Resources	2021	0.5	40	n.a.
33	Northvolt	2019	0.4	750	1,000
34	MES	2021	0.2	38	n.a.
35	Cellforce	2024	0.1	n.a.	80
36	Saft	2021	n.a.	200	200
Sourc	e: CICeneraiGUNE				

Figure 14: Existing and planned European lithium ion battery factories

Source: CICenergiGUNE

The most likely customer group for EUR's lithium hydroxide production is the nascent European lithium ion battery industry. The projects listed in figures 13 and 14 above represent annual total capacity of 822 GWh. This is enough to equip over 13m EVs.

# VALUATION

# Figure 15: Key valuation parameters

Item	Unit	2018 PFS accelerated case	FBe 2022	<b>%</b> Δ
Mined Run of Mine	tonnes	7,435,386	11,612,720	56.2%
Run of Mine grade	% Li <sub>2</sub> O	0.71%	0.62%	-
Li <sub>2</sub> O recovery to spodumene concentrate	%	75.8%	75.8%	-
Spodumene concentrate produced (6% Li <sub>2</sub> O)	tonnes	668,120	911,755	36.5%
Feldspar and quartz produced	tonnes	2,215,021	2,952,564	33.3%
Li <sub>2</sub> O recovery in conversion plant	%	89.7%	89.7%	-
LiOH H <sub>2</sub> O produced	tonnes	101,287	137,762	36.0%
Сарех	US\$m	423.6	497.73	17.5%
Lithium hydroxide cost (gross)	US\$/tonne	8,296	10,163	22.5%
Feldspar/quartz credits	US\$/tonne	1,735	1,500	-13.5%
Lithium hydroxide cost (after feldspar/quartz credits)	US\$/tonne	6,561	8,663	32.0%

Source: First Berlin Equity Research estimates, European Lithium

Our price target for the European Lithium share is €0.17. The recommendation is Buy. Figure 15 shows the valuation parameters used in our current study in comparison with the numbers shown in the 2018 PFS. The increase in lithium hydroxide produced reflects the 36% increase in the M+I resource shown in the 2021 resource estimate compared with the 2017 resource estimate. We have raised our capex estimate by 17.5% due to inflation, and the gross opex estimate by 22.5% to reflect both inflation and the lower average grade of the 2021 M+I resource compared with 2017 (1.03% vs. 1.17%). The net opex estimate rises by 32% because we model US\$1,500 per tonne in feldspar/quartz credits compared with US\$1,735 in the 2018 PFS. Discounting the cashflows shown in figure 16 below by 10% produces a valuation for the European Lithium share of €0.171. We set a price target of €0.17 and our recommendation is Buy.

# Figure 16: Valuation Model\*

	21/22E	22/23E	23/24E	24/25E	25/26E	26/27E	27/28E	28/29E	29/30E
Total mined (k tonnes)	0	0	0	140	700	800	800	800	800
Run of mine grade (Li <sub>2</sub> O)	-	-		0.71%	0.71%	0.71%	0.71%	0.71%	0.71%
Li <sub>2</sub> O recovery to spodumene concentrate	-	-	-	75.4%	75.4%	75.4%	75.4%	75.4%	75.4%
Spodumene concentrate produced (6% Li <sub>2</sub> O, tonnes)	-	-	-	10,992	54,959	62,811	62,811	62,811	62,811
Li <sub>2</sub> O recovery in conversion plant	-	-	-	89.7%	89.7%	89.7%	89.7%	89.7%	89.7%
LiOH H <sub>2</sub> O produced (tonnes)	-	-	-	1,661	8,304	9,490	9,490	9,490	9,490
LiOH H <sub>2</sub> O price (US\$/tonne)	-	-	-	25,000	25,000	25,000	25,000	25,000	25,000
LiOH H <sub>2</sub> O revenue (US\$m)	0.0	0.0	0.0	41.5	207.6	237.3	237.3	237.3	237.3
By-products (US\$m)	0.0	0.0	0.0	2.5	12.5	14.2	14.2	14.2	14.2
Total revenue (US\$m)	0.0	0.0	103.7	44.0	220.1	251.5	251.5	251.5	251.5
Total operating cost (US\$m)	10.0	4.0	2.5	16.9	84.4	96.5	96.5	96.5	96.5
EBITDA (US\$m)	-10.0	-4.0	101.1	27.1	135.7	155.0	155.0	155.0	155.0
Depreciation (US\$m)	0.0	0.0	0.0	6.0	30.0	34.3	34.3	34.3	34.3
EBIT (US\$m)	-10.0	-4.0	101.1	21.1	105.7	120.8	120.8	120.8	120.8
25% tax (US\$m)	0.0	0.0	0.0	5.3	26.4	30.2	30.2	30.2	30.2
Operating CF after tax (US\$m)	-10.0	-4.0	101.1	21.9	109.3	124.9	124.9	124.9	124.9
Capital cost mine (US\$m)	0.0	0.0	45.9	45.9	0.0	0.0	0.0	0.0	0.0
Capital cost processing plant (US\$m)	0.0	0.0	202.9	202.9	0.0	0.0	0.0	0.0	0.0
Net cashflow (US\$m)	-10.0	-4.0	-147.7	-227.0	109.3	124.9	124.9	124.9	124.9
NPV net cashflows (discount rate: 10%, US\$m)	-9.7	-3.5	-118.8	-166.0	72.6	75.4	68.6	62.4	56.7
Sum NPVs (US\$m)	374.3								
Sum NPVs (A\$m)	505.7								
End December 2021 net cash position (A\$m)	9.4								
PV option exercise proceeds (A\$m)	13.9								
PV pre-production equity capital raise (A\$m)	237.0								
Total equity valuation (A\$m)	765.9								
Current no. shares outstanding (m)	1,159.1								
PV no. shares issued against option exercise (m)	179.1								
PV no. shares through equity capital raise (m)	1,579.8								
PV no. shares performance rights issue (m)	77.9								
Proforma share count (m)	2,995.9								
Value per share (A\$)	0.256								
Value per share (€)	0.171								

\*for layout purposes the model shows numbers only to 2029/30E, but runs until 2039/40E

Source: European Lithium, First Berlin Equity Research estimates

# Figure 17: Sensitivity of per share valuation to discount rate

	Discount rate								
	6%	8%	10%	12%	14%				
Fair value per share in €	0.244	0.203	0.171	0.145	0.123				

Source: First Berlin Equity Research estimates

# **INCOME STATEMENT**

All figures in A\$ 000's	2020/21A	2021/22E	2022/23E	2023/24E	2024/25E	2025/26E
Revenue and other incomes	31	66	67	70	59,457	297,283
Grant income	0	0	0	140,000	0	0
Mining and processing costs	0	0	0	0	-22,802	-114,009
Parent co. employee benefits expense	-349	-336	-340	-340	-340	-340
Consulting fees	-500	-7,000	-2,500	-500	-500	-500
Travel expenses	-86	-200	-400	-400	-400	-400
Regulatory and compliance costs	-1,361	-787	-1,200	-1,200	-900	-500
Reverse takeover transaction cost	0	0	0	0	0	0
Other expenses	-1,381	-1,525	-1,000	-1,000	-1,000	-1,000
EBITDA	-3,646	-9,782	-5,373	136,630	33,515	180,534
Depreciation, amortisation and impairment	-15	-10	-10	-10	-8,106	-40,530
Operating income (EBIT)	-3,661	-13,452	-5,383	136,620	25,409	140,004
Associates	-23	-10	-10	-10	-10	0
Net financial result	-281	-17	38	417	-28,888	-29,904
Pre-tax income (EBT)	-3,965	-13,479	-5,355	137,027	-3,489	110,099
Income taxes	0	0	0	0	731	-23,121
Net income / loss	-3,965	-13,479	-5,355	137,027	-2,759	86,979
Diluted EPS (in A\$c)	-0.50	-1.17	-0.41	4.16	-0.08	2.62
Ratios						
EBITDA margin on revenues	n.m.	n.m.	n.m.	n.m.	56.4%	60.7%
EBIT margin on revenues	n.m.	n.m.	n.m.	n.m.	42.7%	47.1%
Net margin on revenues	n.m.	n.m.	n.m.	n.m.	-4.6%	29.3%
Tax rate	0.0%	0.0%	0.0%	0.0%	20.9%	21.0%
Expenses as % of revenues						
Mining and processing costs	0.0%	0.0%	0.0%	0.0%	38.4%	38.4%
Parent co. employee benefits expense	1132.0%	507.4%	507.5%	485.7%	0.6%	0.1%
Other expenses	4479.5%	2303.3%	1492.5%	1428.6%	1.7%	0.3%
Y-Y Growth						
Revenues	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Operating income	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Net income/ loss	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

# **BALANCE SHEET**

All figures in A\$ 000's	2020/21A	2021/22E	2022/23E	2023/24E	2024/25E	2025/26E
Assets						
Current assets, total	5,663	1,710	6,466	217,421	25,778	156,855
Cash and cash equivalents	5,422	1,450	6,186	217,121	25,184	153,882
Trade and other receivables	241	260	280	300	595	2,973
Restricted cash and other deposits	0	0	0	0	0	C
Non-current assets, total	38,611	42,656	42,646	378,818	706,894	666,363
Property, plant & equipment	9	21	21	336,203	664,289	623,758
Deferred exploration and evaluation expenditure	38,031	42,054	42,054	42,054	42,054	42,054
Investment in associates	541	531	521	511	501	501
Restricted cash and other financial assets	31	30	30	30	30	30
Listed investments	0	20	20	20	20	20
Right of use assets	0	0	0	0	0	C
Total assets	44,275	44,366	49,112	596,239	732,672	823,218
Shareholders' equity & debt						
Current liabilities, total	1,707	1,500	1,600	1,700	892	4,459
Trade and other payables	1,349	1,500	1,600	1,700	892	4,459
Convertible notes	358	0	0	0	0	C
Lease liabilities	0	0	0	0	0	C
Borrowings	0	0	0	0	0	C
Long term liabilities, total	0	0	0	140,000	280,000	280,000
Lease liabilities	0	0	0	0	0	C
Borrowings	0	0	0	140,000	280,000	280,000
Shareholders' equity	42,568	42,866	47,512	454,539	451,780	538,759
Total consolidated equity and debt	44,275	44,366	49,112	596,239	732,672	823,218
Ratios						
Current ratio (x)	3.32	1.14	4.04	127.89	28.90	35.18
Quick ratio (x)	3.32	1.14	4.04	127.89	28.90	35.18
Net debt	-5,453	-1,480	-6,216	-77,151	254,786	126,088
Net gearing	-12.8%	-3.5%	-13.1%	-17.0%	56.4%	23.4%
Book value per share (in A\$c)	4.56	3.91	3.69	18.83	13.67	16.25

# **CASH FLOW STATEMENT**

All figures in A\$ 000's	2020/21A	2021/22E	2022/23E	2023/24E	2024/25E	2025/26E
Cash flow from operating activities						
Revenue and other income	0	66	67	70	59,457	297,283
Payments to suppliers, employees; mining costs	-2,536	-9,406	-4,940	-2,940	-25,442	-116,249
Finance costs	-6	0	0	0	0	0
Interest paid (leased assets)	0	0	0	0	0	0
Interest received	31	0	0	0	0	0
Net interest received/(paid)	0	-17	38	417	-28,888	-29,904
Decrease/(increase) in restricted cash balances	0	0	0	0	0	0
VAT refund	-49	85	0	85	0	0
Grant received	0	0	0	140,000	0	0
Payment for repurchase of royalty	0	-3,660	0	0	0	0
Tax paid	0	0	0	0	731	-23,121
Other	0	-396	-420	-505	-1,603	689
Net cash provided by/(used in) operating activities	-2,561	-13,327	-5,255	137,127	4,255	128,698
Cash flow from investing activities						
Payment for acquisition of exploration tenements	-71	-181	0	0	0	0
Investment in Jadar acquisition	-125	0	0	0	0	0
Proceeds from the sale of exploration tenements	0	0	0	0	0	0
Payments for exploration and evaluation	-3,036	-3,842	0	0	0	0
Payment for property, plant and equipment	-7	-22	-10	-336,192	-336.192	0
Investment in listed shares	0	-20	0	0	0	0
Cash acquired on acquisition of accounting subsidiary	0	0	0	0	0	0
Net cash provided by/(used in) investing activities	-3,239	-4,065	-10	-336,192	-336,192	0
Free cash flow	-5,800	-17,393	-5,265	-199,065	-331,937	128,698
Cash flow from financing activities						
Proceeds from capital raisings/option exercise	11,255	13,777	10,000	270,000	0	0
Increase/(decrease) in loans and borrowings	0	0	0	140,000	140,000	0
Convertible notes	1,000	0	0	0	0	0
Repayment of convertible notes	-636	0	0	0	0	0
Issue costs	-679	0	0	0	0	0
Transfer to subsidiaries	0	0	0	0	0	0
Other	-14	0	0	0	0	0
Net cash provided by financing activities	10,926	13,777	10,000	410,000	140,000	0
Net increase in cash and cash equivalents	5,126	-3,615	4,735	210,935	-191,937	128,698
Cash and cash equivalents at the beginning of the year	301	5,422	1,807	6,543	217,478	25,541
Effects of exchange rate fluctuations on cash held	0	0	0	0	0	0
Cash and cash equivalents at the end of the year	5,422	1,807	6,543	217,478	25,541	154,239
EBITDA/share (in A\$c)	-0.58	-1.17	-0.41	4.15	1.01	5.45
Y-Y Growth						
Operating cash flow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
Free cash flow	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.
EBITDA/share	n.m.	n.m.	n.m.	n.m.	n.m.	n.m.

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#### ASSET VALUATION SYSTEM

First Berlin's system for asset valuation is divided into an asset recommendation and a risk assessment.

#### ASSET RECOMMENDATION

The recommendations determined in accordance with the share price trend anticipated by First Berlin in the respectively indicated investment period are as follows:

Category Current market capitalisation (in €)		1 0 - 2 billion	2 > 2 billion
Buy	An expected favourable price trend of:	> 25%	> 15%
Add	An expected favourable price trend of:	0% to 25%	0% to 15%
Reduce	An expected negative price trend of:	0% to -15%	0% to -10%
Sell	An expected negative price trend of:	< -15%	< -10%

<sup>1</sup> The expected price trend is in combination with sizable confidence in the quality and forecast security of management

Our recommendation system places each company into one of two market capitalisation categories. Category 1 companies have a market capitalisation of  $\leq 0 - \leq 2$  billion, and Category 2 companies have a market capitalisation of  $> \leq 2$  billion. The expected return thresholds underlying our recommendation system are lower for Category 2 companies than for Category 1 companies. This reflects the generally lower level of risk associated with higher market capitalisation companies.

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#### **RECOMMENDATION & PRICE TARGET HISTORY**

Report No.:	Date of publication	Previous day closing price	Recommendation	Price target
Initial Report	7 March 2018	€0.15	Add	€0.19
2	23 May 2018	€0.13	Buy	€0.19
3	17 September 2018	€0.10	Buy	€0.22
4	Today	€0.07	Buy	€0.17

#### **INVESTMENT HORIZON**

Unless otherwise stated in the financial analysis, the ratings refer to an investment period of twelve months.

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#### Legally required information regarding

key sources of information in the preparation of this research report

- valuation methods and principles
- sensitivity of valuation parameters

can be accessed through the following internet link: https://firstberlin.com/disclaimer-english-link/

SUPERVISORY AUTHORITY: Bundesanstalt für Finanzdienstleistungsaufsicht (German Federal Financial Supervisory Authority) [BaFin], Graurheindorferstraße 108, 53117 Bonn and Marie-Curie-Straße 24-28, 60439 Frankfurt am Main

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