AlsterResearch

Vulcan Energy Resources

Australia | Basic Materials | MCap AUD 1,162.7m

10 March 2022

UPDATE

Energy crisis underpins Vulcan's business model - BUY

What's it all about?

With the Russian war against Ukraine and the associated sanctions, some of the economic consequences of this war are immediate, as certain metals like aluminum, nickel and palladium, but also crude oil and natural gas have seen steep price increases since the start of the war. Much likely, the push into renewable energies is about to accelerate as energy policy is reevaluated. Going in the same direction, the Fraunhofer Institute sees geothermal energy as a viable substitute for fossil energy sources and recommends action by policymakers and industry for an accelerated penetration. Overall, we expect the conditions for Vulcan to receive a further impetus not only due to the conflict, but also due to the fulfillment of climate targets. We confirm our PT with AUD 20.00, equivalent to EUR 13.22. We reiterate to BUY.

BUY (BUY)

Target price	**AUD 20.00 (20.00)**
Current price	AUD 8.98
Up/downside	122.7%

ResearchHub

MAIN AUTHOR
Alexander Zienkowicz
a.zienkowicz@alsterresearch.com
+49 40 309 293 56

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Energy crisis underpins Vulcan's business model - BUY

With the Russian war against Ukraine and the associated sanctions, some of the economic consequences of this war are immediate: Russia for example is a large exporter of hydrocarbons like crude oil and natural gas, agricultural products like wheat and barley and certain metals like aluminum, nickel and palladium. All of these have seen steep price increases since the start of the war. These effects underpin the need for domestic geothermal energy to reduce dependence on energy and gas imports. The longer-term economic consequences will very much depend on how the crisis unfolds, and on the choices taken by governments. Much likely, the push into renewable energies is about to accelerate as energy policy is reevaluated.

A strategy paper presented by the Fraunhofer Institute is aimed in this direction. Fraunhofer Institute sees the need for Germany to significantly accelerate the expansion of geothermal energy as a viable substitute for fossil energy sources. This would also enable a rapid reduction in CO2 emissions. Harnessing the thermal brine is a key integral for Vulcan's technological approach to tap the lithium deposits and to produce lithium hydroxide with a neutral carbon footprint. The strategy paper defined various recommendations for action by policymakers and industry that could promote faster penetration of the geothermal technology. In a conservative calculation, the institute estimates that the hydrothermal potential at 300 TWh per year. Based on this assumption, up to 100 deep wells are required per GW of installed capacity (assumption: 15 to 25 MW thermal per doublet): i.e. approx. 2,000 wells would have to be drilled by 2030. In this regard, policymakers would have to streamline the regulatory framework.

On the industry's side, creating acceptance is a key task, e.g. by setting up demonstration plants, since visible and successful demonstration projects can reduce reservations and create a valuable information basis for further projects.

- *continued* -

Vulcan Energy Resources	2019	2020	2021	2022E	2023E	2024E
Sales	0.0	0.0	0.0	4.8	9.1	17.3
Growth yoy	na	na	na	na	87.5%	90.9%
EBITDA	-0.6	-3.3	-10.5	-14.2	-14.2	-11.0
EBIT	-0.9	-3.6	-10.9	-14.3	-14.5	-13.8
Net profit	-0.8	-3.6	-10.7	-9.6	-30.7	-44.1
Net debt (net cash)	-3.3	-6.4	-114.1	-331.0	-430.8	191.5
Net debt/EBITDA	5.5x	1.9x	10.9x	23.3x	30.3x	-17.4x
EPS reported	-0.03	-0.07	-0.12	-0.07	-0.21	-0.27
DPS	0.00	0.00	0.00	0.00	0.00	0.00
Dividend yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Gross profit margin	na	na	na	53.1%	50.0%	41.3%
EBITDA margin	na	na	na	-293.0%	-156.6%	-63.6%
EBIT margin	na	na	na	-294.3%	-159.3%	-79.8%
ROCE	-23.5%	-40.5%	-8.4%	-3.9%	-0.9%	-0.6%
EV/EBITDA	-1,916.2x	-349.1x	-99.8x	-58.6x	-51.5x	-122.8x
EV/EBIT	-1,298.7x	-321.3x	-96.5x	-58.4x	-50.6x	-97.8x
PER	-340.8x	-121.9x	-72.9x	-120.8x	-42.2x	-32.7x
FCF yield	-0.2%	-0.4%	-0.4%	-0.9%	-2.1%	-3.2%

Source: Company data, AlsterResearch; Fiscal year end: 30. June

Source: Company data, AlsterResearch

High/low 52 weeks	16.65 / 5.18
Price/Book Ratio	6.1x

Ticker / Symbols

ISIN	AU0000066086
WKN	A2PV3A
Bloomberg	VUL:AU

Changes in estimates

		Sales	EBIT	EPS
2022E	old	00.0	00.0	00.0
	Δ	–	–	–
2023E	old	00.0	00.0	00.0
	Δ	–	–	–
2024E	old	00.0	00.0	00.0
	Δ	–	–	–

Key share data

Number of shares: (in m pcs)	129.48
Book value per share: (in AUD)	1.48
Ø trading volume: (12 months)	40,000

Major shareholders

F. Wedin	12.5%
HPPL Group (G. Rinehart)	5.6%
G. Rezos	5.8%
Free Float	76.1%

Company description

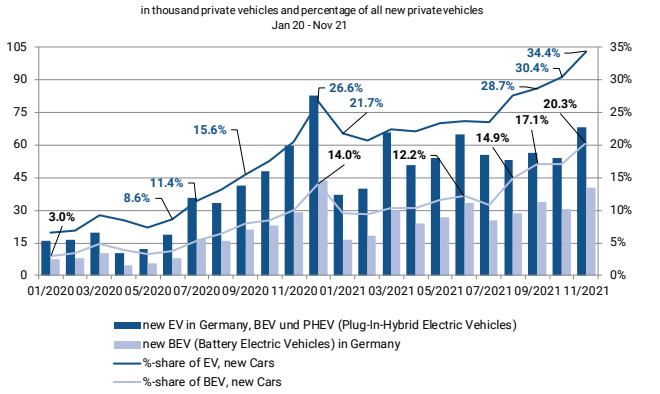
The Australian lithium chemicals & renewable energy company Vulcan Energy Resources Ltd. has been developing a project in the Upper Rhine Valley in Germany that combines the use of thermal water as an energy source (hydrogeothermal energy) with the extraction of the lithium contained in the geothermal brine without polluting the environment with emissions, waste material or toxic substances. With a CO2 footprint of "zero", the project is predestined to mark the beginning of the decarbonization of the battery industry.

In terms of acceptance: the engineering and construction of Vulcan's demonstration plant is progressing. With the target to enter production by mid-2022, Vulcan's demo plant will consist of two parts: the DLE plant (direct lithium extraction) and the lithium hydroxide production plant. The plant will demonstrate the full process from DLE to lithium hydroxide production including recycle streams.

Conclusion: Aside from the future production of carbon neutral lithium, Vulcan produces geothermal energy and heat. Clearly, Vulcan would benefit from an increasing penetration of geothermal energy by streamlined regulatory procedures, as it would simultaneously help identify and develop the lithium deposits within the granted licenses. In terms of acceptance, Vulcan is already making efforts on its own initiative to convince policymakers and the public of the merits of the technology. Overall, we expect the conditions for Vulcan to receive a further impetus not only due to the conflict, but also due to the fulfillment of climate targets. We confirm our PT with AUD 20.00, equivalent to EUR 13.22. We reiterate to BUY. The recently published half-year report confirms the activity report published in January, with the company having a cash position per end of December 2021 of EUR 135m.

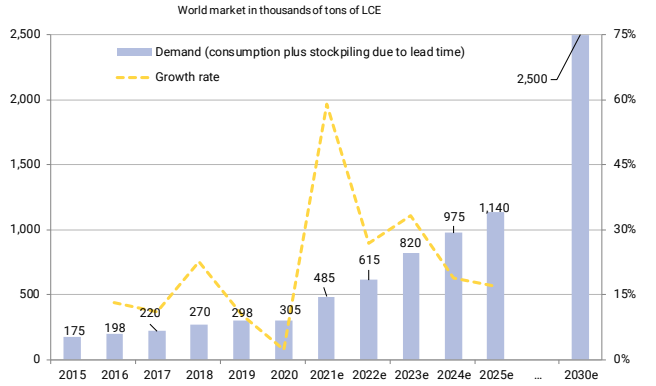
Investment case in six charts

Germany: Electric Vehicles (EV) & Battery Electric Vehicles



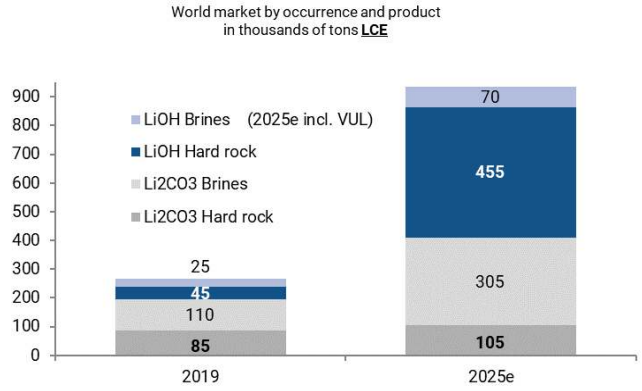
Source: Kraftfahrtbundesamt

World market: Lithium demand



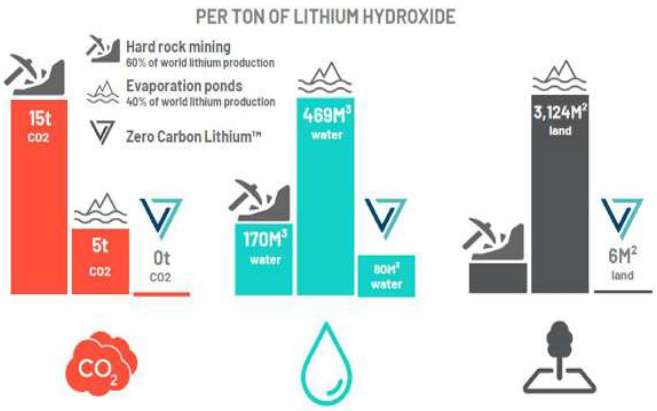
Source: Austral. Gov. (Resources and Energy Quarterly Sep 18 to Sep 21), Albemarle (graphic Sep 2021), Data processing: SRH AlsterResearch

World market: Structure of Li supply



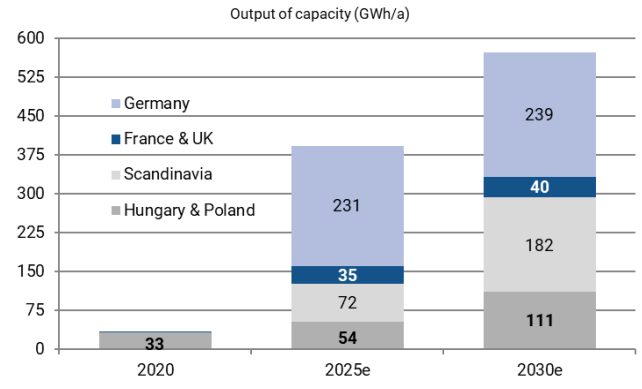
Source: Albemarle (graphic Dec 2019, reconfirmed Sep 2021), Note on VUL/Vulcan Energy Resources: SRH AlsterResearch

Environmental Footprint



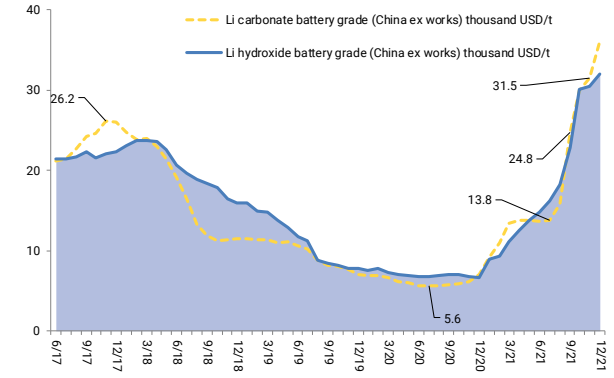
Source: Vulcan Energy Resources

Europe: Lithium-ion battery cell factories



Source: Fraunhofer ISI (Jan 2020)

Pricing performance Lithium



Source: Deutsche Rohstoffagentur (Preismonitor, data LC prices), Data processing LiOH prices: SRH AlsterResearch

Company background

Product

Battery grade lithium hydroxide from brine sources in Germany – the Australian exploration company has been on target for becoming a leading supplier of a material that is central to the electrification strategies of the automotive industry. And by operating its geothermal plant in Insheim, Vulcan will already have become a renewable energy producer, following the formal takeover on 1 January 2022.

Vulcan's Zero Carbon Lithium™ Project – it rather is a portfolio of projects than one single – combines operations of extraction in the lithium-rich geothermal brine of the Upper Rhine Valley, of upgrading lithium to a high purity hydroxide (LiOH) as well as the production of hydrogeothermal energy (renewable electricity and heat). Thermal water will be used as energy source, and thus the extraction of lithium contained in the brine will run without polluting the environment with emissions, waste material or toxic substances. With a CO_2 footprint of "zero", the project is predestined to mark the beginning of the decarbonization of the battery industry.

In Vulcan's project areas, a staged development will implement a process technology proven effective for more than 20 years in industrial lithium carbonate production, which is known as Direct Lithium Extraction (DLE). Vulcan's first DLE pilot plant has been operating since April 2021 at the geothermal plant in Landau, using live geothermal brine from existing wells. Vulcan is partnering with DuPont Water Solutions to assist Vulcan with input and brine chemistry test work during the project's Definitive Feasibility Study (DFS).

Estimated resources of Vulcan's Upper Rhine Valley Project have reached a total of approx. 15.85 million t LCE in JORC-compliant terms (Inferred and Indicated Mineral Resource, probable Mineral Reserve: 1.12 million t LCE). A portion of 3.62 million t LCE has been classified as Indicated status. This puts Vulcan at the top of the rankings for the peer group of exploration projects in Europe – which are, with the exception of Cornish Lithium in Cornwall, all based on hard rock deposits.

Upper Rhine Valley resource estimate

		Insheim **indicated**	**Taro indicated**	**Taro inferred**	**Ortenau indicated**	**Ortenau inferred**	**Upper Rhine Valley indicated + inferred**
Total Volume of Brine Aquifer	km^3	8,322	8,419	15,924	17,001	117,974	
Average Porositiy		9.000	10.227	9.400	12.600	9.500	
Average concentration	mg/l	181	181	181	181	181	
total elemental Li	mg	13,556,538	15,584,136	27,092,171	38,772,481	202,856,293	
total elemental Li	kt	136	156	271	388	2,029	
Lithium carbonate - LCE	kt	**722**	**830**	**1,442**	**2,064**	**10,798**	**15,855**
thereof indicated	kt	**722**	**830**		**2,064**		**3,615**
inferred	kt			**1,442**		**10,798**	**12,240**
Lithium hydroxide	kt	820	942	1,638	2,344	12,264	18,007
Lithiumoxid	kt	292	336	583	835	4,367	6,413

Sources: Vulcan Energy Resources, SRH AlsterResearch

Picture: Geothermal power plant in Insheim, Upper Rhine Valley, Germany

Lithium-ion batteries are classified based on the composition of the cathode and anode material used. Nickel-cobalt-manganese cathodes, in short: NMC cathodes, currently determine the market momentum. Within this group, low-cost nickel that is readily available in good quantities (here: "N") is replacing manganese (here: "M") and cobalt (here: "C") to a large extent Whereas the ratio of the first NMC generation was 1:1:1 (NMC 111), the new NMC 622 cathode generation is currently proving increasingly popular. Technically, this requires the use of lithium hydroxide (LiOH) instead of lithium carbonate (Li_2CO_3), insofar as cathode synthesis using lithium carbonate requires high temperatures, which in turn are incompatible with a nickel content of 60% and above (vs. 40% cobalt and manganese). Furthermore, the energy density (or specific energy, energy per mass) of lithium hydroxide exceeds that of lithium carbonate. According to Albemarle's estimate, LiOH production from hard rock deposits will have increased tenfold by 2025 and will account for 80% of lithium production from hard rock deposits (2019: 35%). LiOH production from brine is forecast to treble, meaning that its share of lithium production from brine will remain at 20%.

Due to the Pre-Feasibility Study (PFS), Vulcan's project reaches unparalleled dimension with an envisaged annual LiOH-production target of 39.4 thousand t (34.7 thousand t LCE p.a.).

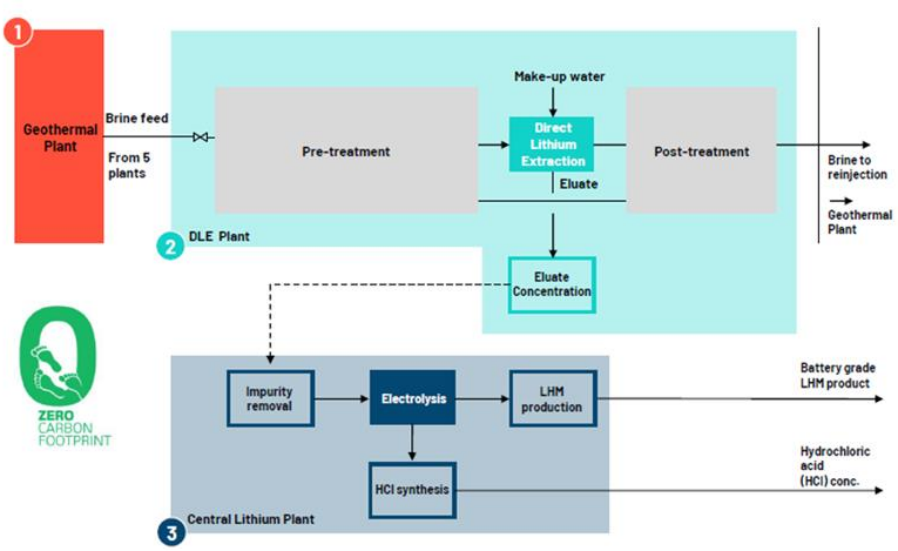
Volume yield estimate Upper Rhine Valley (Taro, Ortenau)

		Taro North (B1)	Taro South (B2)	Ortenau (C1)	Ortenau (C2, C3)	Taro & Ortenau
number of wells (doublets)		3	2	3	6	14
Flow rate per well	m^3/a	3,153,600	3,784,320	3,153,600	3,153,600	
	l/d	8,640,000	10,368,000	8,640,000	8,640,000	
Approach: 8,760 h/anno	l/h	360,000	432,000	360,000	360,000	
	l/s	100.000	120.000	100.000	100.000	
average concentration	mg/l	181	181	181	181	
Day factor (7,842 h of 8,760 h)		0.90	0.90	0.90	0.90	
DLE plant recovery		0.90	0.90	0.90	0.90	
Lithium refinery plant recovery		0.99	0.99	0.99	0.99	
Share VUL	mg/l	100%	100%	100%	100%	
Li/s	mg	43,126	34,501	43,126	86,253	
Li/h	kg	155.25	124.20	155.25	310.51	
Li/d	kg	3,726	2,981	3,726	7,452	
Li/a	kg	1,360,031	1,088,025	1,360,031	2,720,063	
Li/a	t	1,360	1,088	1,360	2,720	6,528
Lithium carbonate LCE/a	t	7,239	5,791	7,239	14,478	34,748
Lithium hydroxide/a	t	**8,222**	**6,578**	**8,222**	**16,444**	39,466

Source: SRH AlsterResearch

Simplified image of Zero Carbon Lithium™ Process

1. Hot brine extracted from the ground and generates steam that powers turbines and produces renewable electricity
   - Standard geothermal production wells successfully implemented for decades on salars
2. Brine flow is diverted, and lithium is extracted from the solution with a Direct Lithium Extraction (DLE) process.
   - Commercially used for decades
3. Lithium chloride sent to lithium refining plant which will be converted LiCl to battery quality LiOH
   - Water is recycled, no toxic wastes, no gases are emitted, heat and power from renewable resources, no fossil fuels are burnt



Growth

Advancement of the Zero Carbon Lithium™ Project is not dependent on securing further external funds before the stage is set for the final investment decision (FID), a juncture by which risk related discounts will have eased significantly. Even more, ample size of institutional funds (cash position end of December 2021: EUR 135.3m, then AUD 214.6m) gives leeway with which the management is able to act opportunistically, also to attract the ambitious and competent professionals the project will need, and thus to accelerate the process further.

Vulcan has grown through acquisitions of German geothermal consultancy and engineering businesses and has an unparalleled surface and sub-surface geothermal development team in house to execute deep geothermal projects. Consultancy company GeoT (GeoThermal Engineering), Karlsruhe, has been established and led to a world-leading consultancy for deep geothermal energy projects by Dr Kreuter. Its 12 team members form the core of Vulcan's energy business development team, together with 25 members of gec-co. Geothermal surface company gec-co (Global Engineering Consulting-Company), with technical teams in Augsburg, Bremen and Karlsruhe, has been focused on surface installations and drilling for electricity and heating plant projects in the deep thermal energy sector, involving profound experience in mechanical engineering (energy, environmental, process technology). gec-co supports investors, local authorities and clients throughout permitting, construction and operating phase.

While Dr Horst Kreuter coordinates public affairs and public relations of the Zero Carbon Lithium™ project, Thorsten Weimann, founder and managing director of gec-co, has become Chief Operating Officer of Vulcan in Germany, responsible for the combined geothermal energy and lithium operations.

Vulcan's in-house team for the development of lithium operations, comprising DLE (Direct Lithium Extraction) as well as the conversion of lithium chloride to lithium hydroxide in the Central Lithium Plant, currently consists of 8 world-leading experts of lithium chemistry and chemical engineering.

Besides counting on its in-house expertise, Vulcan is collaborating with DuPont Water Solutions to test DLE solutions similar to those commercially mature products which are already used in lithium industry. DuPont has several DLE products and assists Vulcan with input and test work during Vulcan's Zero Carbon Lithium™ project DFS. Implemented by a team of its engineers, DuPont has granted access to equipment and material (e.g. resin) at Vulcan's first pilot plant. This input is made available at no cost to Vulcan provided the parties enter into a supply agreement for DLE products following the completion of the DFS.

Customers

Major automotive producing countries have to ramp up battery cell factory capacity within the coming years. The battery comprises as much as 30% to 40% of the vehicle cost. Ensuring that the demand for lithium-ion accumulators for the automotive industry is covered is a matter that has been assigned a high level of priority throughout Europe. Industrial policy ambitions are therefore aimed at establishing a consistently European supply chain. In Germany alone, there are plans to make investments running into the billions in factory complexes for battery cell production. In addition, industrial policy initiatives include the mining of the raw material lithium – which never occurs as a pure element in nature due to its high reactivity – and the processing of the ores/brines.

The need for electric drive systems to have a tolerable carbon footprint in the production phase, too, is a key aspect, and one that has the very highest priority. The supply security argument is also a top priority. For industrial and security policy reasons, Europe has to manage to break away from its current 100% reliance on raw material supplies from South America or Asia.

The Fraunhofer-Gesellschaft estimates European battery cell production to reach a capacity of 396 GWh/a by 2025 and of 576 GWh by 2030 (publication January 2020). Even higher capacity growth is expected by Ultima Media (part of Süddeutscher Verlag, publication March 2021). Ultima Media predicts that Europe will more than double its plant capacity share from 13% in 2020 to 33% by 2030 and reach a capacity of 950 GWh/a, while capacity in Asia is expected to rise to 1,620 GWh/a (projected share of capacity worldwide: 57%).

In July 2021, LG Energy Solution secured annual supplies of up to 10 thousand t LiOH from Vulcan. LG Energy Solution is the largest producer of lithium-ion batteries for electric vehicles in the world and supplies its products to top global OEMs. The strategic partnership of Renault Group and Vulcan, announced in August and originally aiming at a volume of up to 17 thousand t LiOH annually, has eventually led to a binding offtake agreement to purchase 32 thousand t within six years (2026 to 2032). Due to the announcement in October 2021, Umicore is to purchase up to 42 thousand t over the five-year duration of the agreement (start of commercial delivery set for 2025)., With Stellantis, Vulcan has signed potentially the largest offtake agreement (November 2021). A minimum of 81 thousand t and a maximum of 99 thousand t of battery grade LiOH is to be allotted within five years, starting in 2026. Another highlight of Vulcan's customer acquisition process, if not its keystone, is the binding agreement with Volkswagen, signed in December 2021, for up to 42 thousand t LiOH over five years from 2026.

Offtake Agreements

date			start	min t LiOH	max t LiOH	term years	min annual t LiOH	max annual t LiOH	midpoint annual t LiOH
2021-10-18	Umicore	binding offtake agreement	2025	28,000	42,000	5	5,600	8,400	7,000
2021-11-22	Renault Group	binding offtake agreement	2026	26,000	32,000	6	4,333	5,333	4,833
2021-11-29	Stellantis	binding offtake agreement	2026	81,000	99,000	5	16,200	19,800	18,000
2021-12-08	Volkswagen	binding offtake agreement	2026	34,000	42,000	5	6,800	8,400	7,600
2022-01-31	LG Energy Solutions	binding offtake agreement	2025	41,000	50,000	5	8,200	10,000	9,100
							41,133	51,933	46,533
production target (calculation: AlsterResearch)									39,466

Sources: Vulcan Energy Resources, AlsterResearch

Competition

Particularly in the south-west of Australia, the mineral spodumene ($LiAlSi_2O_6$) is mined from hard rock deposits in the region's pegmatite fields (pegmatites belong to the group of magmatic dyke rocks). The majority of the quantities extracted are shipped as concentrate for processing to China, where they cover 75% of the country's lithium requirements; only China has the infrastructure required to break large quantities of concentrate down using metallurgical processes. Established production processes initially produce lithium carbonate (Li_2CO_3). Lithium carbonate is the feedstock used for the production of lithium hydroxide (LiOH), and also for the production of other intermediates such as lithium chloride (LiCl). Processing in the battery industry requires lithium carbonate purities of 99.5% or more. The conversion factor LCE (Lithium Carbonate Equivalent), which is common in international trade, refers to lithium carbonate.

Even more significant on a global scale are the deposits of the light metal lithium in salt lakes in South America ("Lithium Triangle" in the Argentina-Bolivia-Chile border region), North America (Nevada, Utah, Searless Lake and Salton Sea/California) and China (Tibetan Plateau). Lithium carbonate and lithium hydroxide is produced from lithium chloride which is extracted from the brines. Other lithium deposits in Europe are hard rock deposits in pegmatite fields containing spodumene, or in which lithium is bound in certain mixed crystals, such as zinnwaldite and other mica. Another approach to lithium mining in Europe is the mining of the mineral jadarite. The drawback regarding the extraction of lithium from spodumene will be that the concentrate will first of all have to be transported for processing to China's large-scale spodumene conversion plants – a considerable disadvantage in view of the climate policy benefits of electromobility. There has been no industrial capacity for processing zinnwaldite to date.

Various cost advantages owing to geological factors point to the economic viability of Vulcan's lithium project in the Upper Rhine Valley; in addition to the lithium content and a high flow/production rate achieved there, the energy required for the extraction process is significantly lower thanks to what is already a high starting temperature of over 120°C. The most important aspect, however, which also combines cost-effectiveness considerations with the aspect of minimising the "footprint" in terms of the environmental impact, is the immediate proximity to industrial customers. The transportation distance of a few hundred kilometres to existing or planned battery factories and the industrial mobility cluster in the south-west of Germany is a decisive argument that helps to underpin the advantages of Vulcan's battery grade lithium associated with the carbon footprint of the electric drive versus the combustion engine. From 2026, EU regulation requires that lithium-ion batteries will have to bear a carbon intensity performance class label and from July 2027, must comply with maximum carbon footprint thresholds.

Key shareholders

		shares (million)	% of issued capital
Dr Francis Wedin	Managing Director & Founder, CEO	13.03	10.52%
Hancock Prospecting Pty Ltd and Georgina Hope Rinehart		8.17	6.60%
Gavin Rezos	Chair	6.08	4.91%
Top 20 shareholders			~50%

Board

Dr Francis Wedin, Managing Director & Founder – CEO

Founder of Vulcan Zero Carbon Lithium™ Project, lithium industry executive since 2014.

Gavin Rezos, Chair

Executive Chair/CEO of two ASX 300-companies. Investment banking Director of HSBC

Dr Horst Kreuter, Board Advisor

Co-Founder of Vulcan Zero Carbon Lithium™ Project, successful geothermal project development and permitting in Germany and worldwide being CEO of Geothermal Group and GeoThermal Engineering (GeoT)

Annie Liu, Non-Executive Director

Battery expert. Former Tesla Head of Battery and Energy Supply Chain

Dr Heidi Grön, Non-Executive Director

Chemical engineer, since 2007 senior executive with Evonik, responsible for Global product safety, impact assessment and strategy development for sustainability as part of the EU Green Deal and management of Evonik's major investments

Josephine Bush, Non-Executive Director

Expert Renewable/Sustainable Businesses. Member of the EY Power and Utilities Board. Former senior EY Global Renewables Partner

Ranya Alkadamani, Non-Executive Director

Communications strategist, Founder of Impact Group International

Julia Poliscanova – Board Advisor

Electromobility expert, member of the board of the Global Battery Alliance

Rob Ierace, CFO

Chartered Accountant and Chartered Secretary with over 20 years of experience

Daniel Tydde, Company Secretary & In-House Legal Counsel

Corporate lawyer, experienced in commercial & finance areas, including IPO's, equity/debt raisings, regulatory compliance, corporate governance

Key Executives

Thorsten Weimann – Chief Operating Officer in Germany

Managing director of gec-co Global Engineering Consulting-Company, expert in geothermal and drilling technology

Markus Ritzauer – Chief Financial Officer of Vulcan Energie Ressourcen, Germany

Previous Head of Finance at chemical park service provider Currenta, Leverkusen. CFO and other management positions of subsidiaries and affiliates within Bayer and Bayer Group

Dr Stephen Harrison – Chief Technical Officer

Diverse multi-industry background in electrochemistry and lithium extraction, as CTO of Simbol Materials led to develop a process to extract lithium from geothermal brine, recognised as lowest cost production method to lithium hydroxide. CEO of Rakehill Technology, consulted industry on various lithium extraction technologies

Vincent Ledoux Pedailles – Vice President – Business Development

Previously Executive Director at Infinity, also worked at IHS Markit, where he led the lithium and battery materials research team

SWOT Analysis

Strength

- Location: Close proximity to the European battery industry which is currently being established, short transportation distance (carbon footprint, 1st aspect)
- Largest JORC-compliant lithium resource in Europe (Inferred and Indicated Mineral Resource)
- Carbon footprint, 2nd aspect: Lithium production using geothermal energy, without polluting the environment with emissions, waste material or toxic substances.
- Cash position of EUR 135m (~AUD 214m, ~USD 153m) is sufficient for accelerated project development, including extensive test work and development of pilot plants. Advancement of the Zero Carbon Lithium™ Project is not dependent on securing further external funds before the stage is set for the final investment decision (FID), a juncture by which risk related discounts will have eased significantly.
- Lithium is separated within a matter of hours, eliminating external interference factors
- Lithium marketing has not only started, but per December 2021, the orderbook for the first six years of production has already been filled: LG Energy Solution has secured annual supplies of up to 10 thousand t LiOH from Vulcan. Umicore is to purchase up to 42 thousand t of battery grade LiOH over a five-year term. Renault Group signed a binding offtake agreement to purchase 32 thousand t battery grade LiOH within six years (2026 to 2032). Stellantis will purchase a minimum of 81 thousand t and a maximum of 99 thousand t of battery grade LiOH within five years, starting in 2026. Volkswagen will purchase up to 42 thousand t LiOH over five years from 2026.

Weaknesses

- Further funds required for project implementation have yet to be raised
- Investment lead time will take more than two years

Opportunities

- Headstart in the race to commercialize Lithium within Central Europe: Preliminary Feasibility Study (PFS) brings about the leading and – for the time being – a unique position
- Rapid growth in lithium demand among the European battery industry
- Contribution to an independent European lithium supply chain (supply aspect, short transportation distances) creates an incentive for the battery industry to pay a premium over the lithium reference price
- Low-cost asset: Opportunity for operating costs at the lower end/in the lower quartile of the global peer group cost curve
- Income from electricity feed-in as a second source of revenue besides lithium sales

Threats

- The reference price for lithium based on imports in China/Korea/ Japan could come under pressure – as occurred in 2018 and 2019 – and put a damper on investor sentiment
- Approval procedures, in particular legal action against authorisations granted, could delay implementation

Valuation

By using a 25% risk weighting on Equity value, **the DCF model results in a fair value of AUD 19.58 per share:**

Vulcan is retaining 25.85% of Kuniko. Market capitalization of Kuniko is currently (February 2022) close to AUD 53m, but since it is highly volatile, we do not explicitly include the stake in Kuniko into our valuation model.

The forecast model is based on revenues at USD 17.50 thousand/t for lithium hydroxide, which encompasses a potential price premium (25%) to a reference price of USD 14.00 thousand/t.

WACC. The averaged 1- and 3-year historical equity beta is calculated as 1.40. Unleverering and correcting for mean reversion yields an asset beta of 1.27. Combined with a risk-free rate of 2.0% and an equity risk premium of 6.0% this yields cost of equity of 10.5%. With pre-tax cost of borrowing at 6.0%, a tax rate of 25.0% and target debt/equity of 0.2 this results in a long-term WACC of 9.7%.

DCF (AUDm) (except per share data and beta)	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	Terminal value
NOPAT	-10.0	-10.1	-9.7	68.0	316.9	516.6	640.7	656.5	
Depreciation & amortization	0.1	0.2	2.8	29.3	79.2	100.2	115.1	115.1	
Change in working capital	-0.7	0.3	-5.4	-16.5	-30.2	-20.8	-4.8	6.7	
Chg. in long-term provisions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Capex	-17.9	-576.7	-1,190.8	-533.2	-112.1	-112.1	-112.1	-112.1	
Cash flow	-28.6	-586.3	-1,203.2	-452.4	253.7	484.0	639.0	666.3	8,845.7
Present value	-27.8	-520.3	-974.5	-334.4	171.2	298.0	359.1	341.8	4,502.4
WACC	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.6%	9.7%

DCF per share derived from	
Total present value	3,815.5
Mid-year adj. total present value	3,994.1
Net debt / cash at start of year	-300.1
Financial assets	0.0
Provisions and off b/s debt	na
Equity value	4,294.3
No. of shares outstanding	168.3
Discounted cash flow / share	**19.58**
upside/(downside)	**118.1%**
Share price	**8.98**

DCF avg. growth and earnings assumptions	
Planning horizon avg. revenue growth (2021E - 2028E)	n.a.%
Terminal value growth (2028E - infinity)	2.0%
Terminal year ROCE	22.6%
Terminal year WACC	9.7%

Terminal WACC derived from	
Cost of borrowing (before taxes)	6.0%
Long-term tax rate	25.0%
Equity beta	1.40
Unlevered beta (industry or company)	1.27
Target debt / equity	0.2
Relevered beta	1.42
Risk-free rate	2.0%
Equity risk premium	6.0%
Cost of equity	10.5%

Sensitivity analysis DCF

Change in WACC (%-points)	Long term growth 0.0%	1.0%	2.0%	3.0%	4.0%
2.0%	10.3	11.5	13.1	14.9	17.3
1.0%	12.4	14.0	15.9	18.4	21.6
0.0%	14.9	17.0	19.6	23.0	27.5
-1.0%	18.1	20.9	24.4	29.2	36.1
-2.0%	22.2	26.0	31.1	38.3	49.5

Share of present value	
2021E - 2024E	-48.7%
2025E - 2028E	30.7%
terminal value	118.0%

Source: AlsterResearch

Due to the fact that companies rarely bear sufficient resemblance to peers in terms of geographical exposure, size or competitive strength and in order to adjust for the pitfalls of weak long-term visibility, an Adjusted Free Cash Flow analysis (Adjusted FCF) has been conducted.

The adjusted Free Cash Flow Yield results in a **fair value between AUD 0.99 per share based on 2022E and AUD 36.95 per share on 2026E estimates.** It has to be kept in mind that FCF yield methodology does not factor in expansion capex.

The main driver of this model is the level of return available to a controlling investor, influenced by the cost of that investors' capital (opportunity costs) and the purchase price – in this case the enterprise value of the company. Here, the adjusted FCF yield is used as a proxy for the required return and is defined as EBITDA less minority interest, taxes and investments required to maintain existing assets (maintenance capex).

FCF yield in AUDm	2022E	2023E	2024E	2025E	2026E
EBITDA	**-14.2**	**-14.2**	**-11.0**	**126.5**	**531.9**
- Maintenance capex	0.1	-2.9	0.0	70.0	76.9
- Minorities	0.0	0.0	0.0	0.0	0.0
- tax expenses	-4.1	-13.2	-18.9	14.4	121.1
= Adjusted FCF	**-10.1**	**1.9**	**7.8**	**42.1**	**333.9**
Actual Market Cap	**1,181.8**	**1,181.8**	**1,181.8**	**1,181.8**	**1,181.8**
+ Net debt (cash)	-331.0	-430.8	191.5	678.3	458.9
+ Pension provisions	0.0	0.0	0.0	0.0	0.0
+ Off b/s financing	0.0	0.0	0.0	0.0	0.0
- Financial assets	0.0	0.0	0.0	0.0	0.0
- Acc. dividend payments	0.0	0.0	0.0	0.0	0.0
EV Reconciliations	-331.0	-430.8	191.5	678.3	458.9
= Actual EV'	**850.8**	**751.0**	**1,373.3**	**1,860.1**	**1,640.8**
Adjusted FCF yield	**-1.2%**	**0.2%**	**0.6%**	**2.3%**	**20.3%**
base hurdle rate	6.0%	6.0%	6.0%	6.0%	6.0%
ESG adjustment	1.0%	1.0%	1.0%	1.0%	1.0%
adjusted hurdle rate	5.0%	5.0%	5.0%	5.0%	5.0%
Fair EV	**-202.5**	**37.1**	**156.8**	**841.0**	**6,677.6**
- EV Reconciliations	-331.0	-430.8	191.5	678.3	458.9
Fair Market Cap	**128.5**	**468.0**	**-34.7**	**162.7**	**6,218.7**
No. of shares (million)	129.5	144.3	160.6	168.3	168.3
Fair value per share in AUD	**0.99**	**3.24**	**-0.22**	**0.97**	**36.95**
Premium (-) / discount (+)	**-88.9%**	**-63.9%**	**-102.4%**	**-89.2%**	**311.4%**

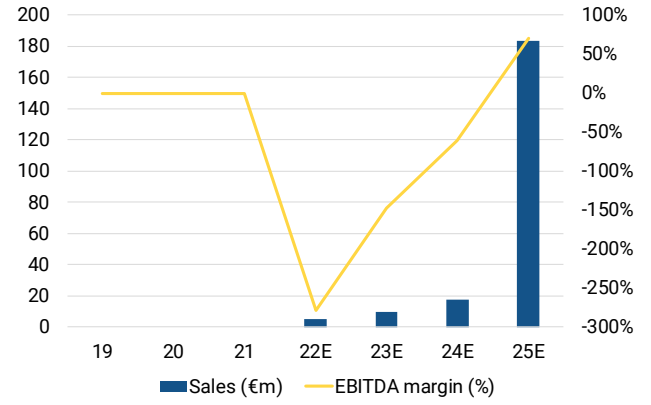
Sensitivity analysis fair value						
Adjusted hurdle rate	3.0%	-0.1	3.4	0.4	4.3	63.4
	4.0%	0.6	3.3	0.0	2.2	46.9
	5.0%	**1.0**	**3.2**	**-0.2**	**1.0**	**36.9**
	6.0%	1.3	3.2	-0.4	0.1	30.3
	7.0%	1.4	3.2	-0.5	-0.5	25.6

Source: Company data; AlsterResearch

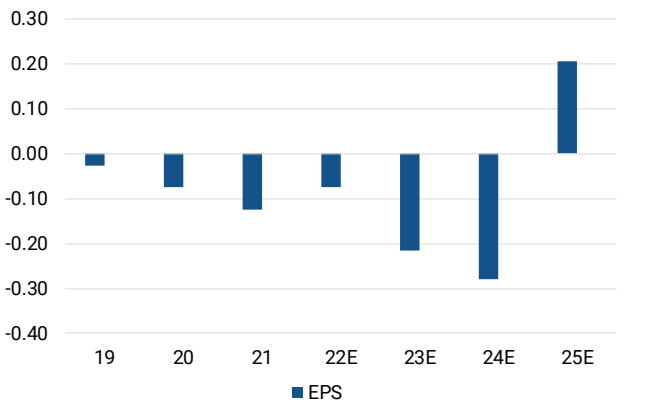
Simply put, the model assumes that investors require companies to generate a minimum return on the investor's purchase price. The required after-tax return equals the model's hurdle rate. Anything less suggests the stock is expensive; anything more suggests the stock is cheap. **ESG adjustments might be applicable, based on the overall Leeway ESG Score. A high score indicates high awareness for environmental, social or governance issues and thus might lower the overall risk an investment in the company might carry. A low score on the contrary might increase the risk of an investment and might therefore trigger a higher required hurdle rate.**

Financials in six charts

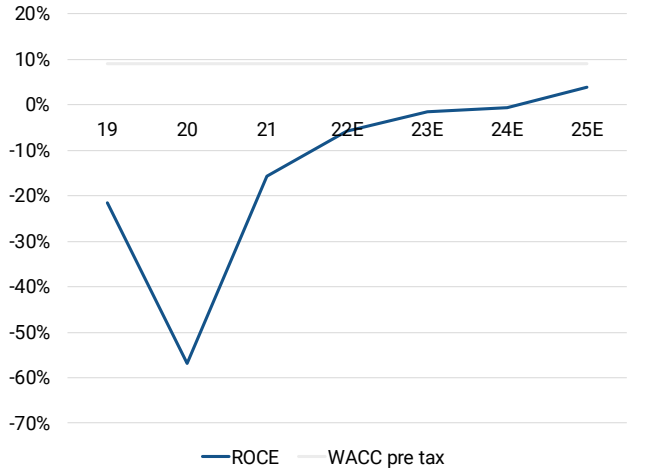
Sales vs. EBITDA margin development



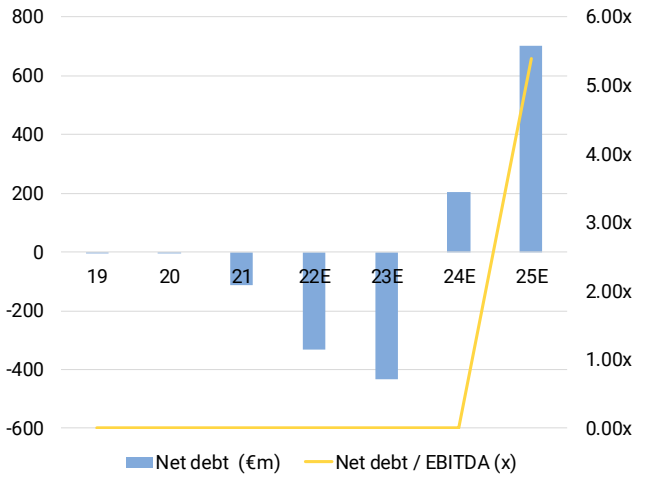
EPS in AUD



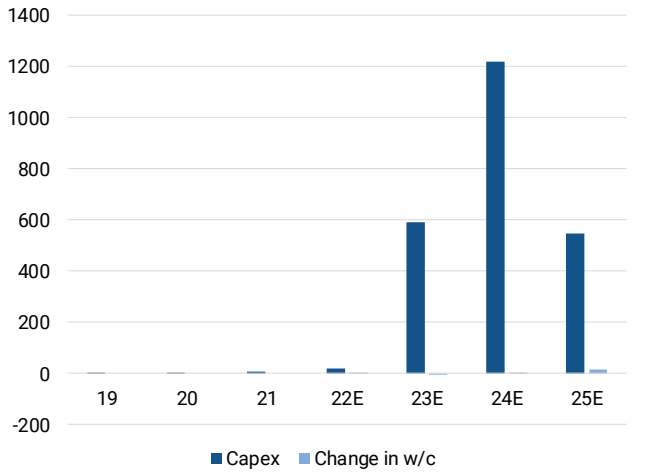
ROCE vs. WACC (pre tax)



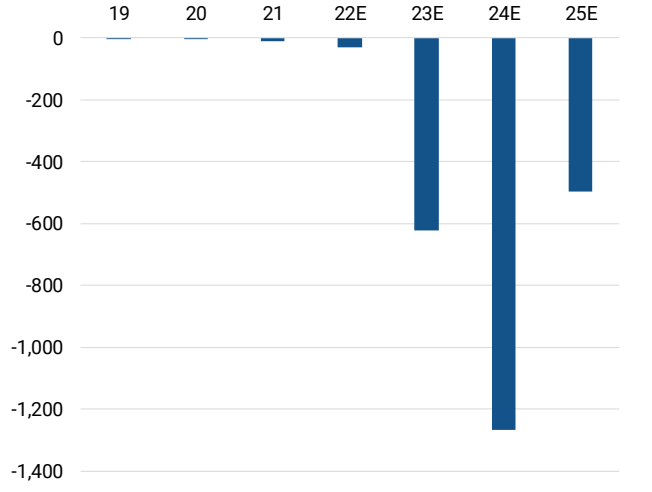
Net debt and net debt/EBITDA



Capex & chgn in w/c requirements in AUDm



Free Cash Flow in AUDm



Source: Company data; AlsterResearch

Financials

Profit and loss (AUDm)	2019	2020	2021	2022E	2023E	2024E
Sales	**0.0**	**0.0**	**0.0**	**4.8**	**9.1**	**17.3**
Sales growth	NaN%	NaN%	NaN%	Infinity%	87.5%	90.9%
Cost of sales	0.0	0.0	0.0	2.3	4.5	10.2
Gross profit	**0.0**	**0.0**	**0.0**	**2.6**	**4.5**	**7.2**
SG&A expenses	0.6	3.4	11.1	16.8	19.0	21.0
Research and development	0.0	0.0	0.0	0.0	0.0	0.0
Other operating expenses (income)	0.0	-0.0	-0.6	0.0	0.0	0.0
EBITDA	**-0.6**	**-3.3**	**-10.5**	**-14.2**	**-14.2**	**-11.0**
Depreciation	0.3	0.3	0.4	0.1	-2.9	0.0
EBITA	-0.9	-3.6	-10.9	-14.3	-11.3	-11.1
Amortisation of goodwill and intangible assets	0.0	0.0	0.0	0.0	3.1	2.8
EBIT	**-0.9**	**-3.6**	**-10.9**	**-14.3**	**-14.5**	**-13.8**
Financial result	0.1	0.0	0.1	0.5	-29.4	-49.1
Recurring pretax income from continuing operations	-0.8	-3.6	-10.7	-13.8	-43.9	-63.0
Extraordinary income/loss	0.0	0.0	0.0	0.0	0.0	0.0
Earnings before taxes	-0.8	-3.6	-10.7	-13.8	-43.9	-63.0
Taxes	0.0	0.0	0.0	-4.1	-13.2	-18.9
Net income from continuing operations	-0.8	-3.6	-10.7	-9.6	-30.7	-44.1
Result from discontinued operations (net of tax)	0.0	0.0	0.0	0.0	0.0	0.0
Net income	**-0.8**	**-3.6**	**-10.7**	**-9.6**	**-30.7**	**-44.1**
Minority interest	0.0	0.0	0.0	0.0	0.0	0.0
Net profit (reported)	-0.8	-3.6	-10.7	-9.6	-30.7	-44.1
Average number of shares	31.75	48.23	87.20	129.48	144.30	160.62
EPS reported	**-0.03**	**-0.07**	**-0.12**	**-0.07**	**-0.21**	**-0.27**

Profit and loss (common size)	2019	2020	2021	2022E	2023E	2024E
Sales	**na**	**na**	**na**	**100%**	**100%**	**100%**
Cost of sales	na	na	na	47%	50%	59%
Gross profit	**na**	**na**	**na**	**53%**	**50%**	**41%**
SG&A expenses	na	na	na	347%	209%	121%
Research and development	na	na	na	0%	0%	0%
Other operating expenses (income)	na	na	na	0%	0%	0%
EBITDA	**na**	**na**	**na**	**-293%**	**-157%**	**-64%**
Depreciation	na	na	na	1%	-32%	0%
EBITA	na	na	na	-294%	-125%	-64%
Amortisation of goodwill and intangible assets	na	na	na	0%	35%	16%
EBIT	**na**	**na**	**na**	**-294%**	**-159%**	**-80%**
Financial result	na	na	na	10%	-324%	-283%
Recurring pretax income from continuing operations	na	na	na	-284%	-483%	-363%
Extraordinary income/loss	na	na	na	0%	0%	0%
Earnings before taxes	na	na	na	-284%	-483%	-363%
Taxes	na	na	na	-85%	-145%	-109%
Net income from continuing operations	na	na	na	-199%	-338%	-254%
Result from discontinued operations (net of tax)	na	na	na	0%	0%	0%
Net income	**na**	**na**	**na**	**-199%**	**-338%**	**-254%**
Minority interest	na	na	na	0%	0%	0%
Net profit (reported)	**na**	**na**	**na**	**-199%**	**-338%**	**-254%**

Source: Company data; AlsterResearch

Balance sheet (AUDm)	2019	2020	2021	2022E	2023E	2024E
Intangible assets (exl. Goodwill)	**0.5**	**2.6**	**14.4**	**15.7**	**13.9**	**12.5**
Goodwill	0.0	0.0	0.0	0.0	0.0	0.0
Property, plant and equipment	0.0	0.0	1.5	18.0	596.3	1,785.7
Financial assets	0.0	0.0	0.0	0.0	0.0	0.0
FIXED ASSETS	**0.5**	**2.6**	**15.8**	**33.7**	**610.2**	**1,798.3**
Inventories	0.0	0.0	0.0	0.0	0.0	6.2
Accounts receivable	0.0	0.1	1.2	0.2	0.4	0.7
Other current assets	0.0	0.0	0.0	0.0	0.0	0.0
Liquid assets	3.3	6.4	114.7	331.0	929.8	635.6
Deferred taxes	0.0	0.0	0.0	0.0	0.0	0.0
Deferred charges and prepaid expenses	0.0	0.0	0.0	0.0	0.0	0.0
CURRENT ASSETS	**3.4**	**6.5**	**115.9**	**331.2**	**930.2**	**642.5**
TOTAL ASSETS	**3.9**	**9.1**	**131.7**	**364.9**	**1,540.4**	**2,440.8**
SHAREHOLDERS EQUITY	**3.8**	**8.9**	**129.0**	**364.5**	**1,040.5**	**1,611.7**
MINORITY INTEREST	0.0	0.0	0.0	0.0	0.0	0.0
Long-term debt	0.0	0.0	0.5	0.0	499.0	827.1
Provisions for pensions and similar obligations	0.0	0.0	0.0	0.0	0.0	0.0
Other provisions	0.0	0.0	0.0	0.0	0.0	0.0
Non-current liabilities	**0.0**	**0.0**	**0.5**	**0.0**	**499.0**	**827.1**
short-term liabilities to banks	0.0	0.0	0.1	0.0	0.0	0.0
Accounts payable	0.1	0.2	2.1	0.5	0.9	2.0
Advance payments received on orders	0.0	0.0	0.0	0.0	0.0	0.0
Other liabilities (incl. from lease and rental contracts)	0.0	0.0	0.1	0.0	0.0	0.0
Deferred taxes	0.0	0.0	0.0	0.0	0.0	0.0
Deferred income	0.0	0.0	0.0	0.0	0.0	0.0
Current liabilities	**0.1**	**0.2**	**2.3**	**0.5**	**0.9**	**2.0**
TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	**3.9**	**9.1**	**131.7**	**364.9**	**1,540.4**	**2,440.8**

Balance sheet (common size)	2019	2020	2021	2022E	2023E	2024E
Intangible assets (excl. Goodwill)	**13%**	**28%**	**11%**	**4%**	**1%**	**1%**
Goodwill	0%	0%	0%	0%	0%	0%
Property, plant and equipment	0%	0%	1%	5%	39%	73%
Financial assets	0%	0%	0%	0%	0%	0%
FIXED ASSETS	**13%**	**28%**	**12%**	**9%**	**40%**	**74%**
Inventories	0%	0%	0%	0%	0%	0%
Accounts receivable	1%	1%	1%	0%	0%	0%
Other current assets	0%	0%	0%	0%	0%	0%
Liquid assets	86%	71%	87%	91%	60%	26%
Deferred taxes	0%	0%	0%	0%	0%	0%
Deferred charges and prepaid expenses	0%	0%	0%	0%	0%	0%
CURRENT ASSETS	**87%**	**72%**	**88%**	**91%**	**60%**	**26%**
TOTAL ASSETS	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
SHAREHOLDERS EQUITY	**97%**	**98%**	**98%**	**100%**	**68%**	**66%**
MINORITY INTEREST	0%	0%	0%	0%	0%	0%
Long-term debt	0%	0%	0%	0%	32%	34%
Provisions for pensions and similar obligations	0%	0%	0%	0%	0%	0%
Other provisions	0%	0%	0%	0%	0%	0%
Non-current liabilities	**0%**	**0%**	**0%**	**0%**	**32%**	**34%**
short-term liabilities to banks	0%	0%	0%	0%	0%	0%
Accounts payable	3%	2%	2%	0%	0%	0%
Advance payments received on orders	0%	0%	0%	0%	0%	0%
Other liabilities (incl. from lease and rental contracts)	0%	0%	0%	0%	0%	0%
Deferred taxes	0%	0%	0%	0%	0%	0%
Deferred income	0%	0%	0%	0%	0%	0%
Current liabilities	**3%**	**2%**	**2%**	**0%**	**0%**	**0%**
TOTAL LIABILITIES AND SHAREHOLDERS EQUITY	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Company data; AlsterResearch

Cash flow statement (AUDm)	2019	2020	2021	2022E	2023E	2024E
Net profit/loss	-0.8	-3.6	-10.7	-9.6	-30.7	-44.1
Depreciation of fixed assets (incl. leases)	0.0	0.0	0.0	0.1	-2.9	0.0
Amortisation of goodwill	0.0	0.0	0.0	0.0	0.0	0.0
Amortisation of intangible assets	0.0	0.0	0.0	0.0	3.1	2.8
Others	0.1	0.1	0.6	0.0	0.0	0.0
Cash flow from operations before changes in w/c	-0.4	-1.3	-2.8	-9.6	-30.5	-41.3
Increase/decrease in inventory	0.0	0.0	0.0	0.0	0.0	-6.2
Increase/decrease in accounts receivable	0.0	0.0	0.0	1.0	-0.2	-0.3
Increase/decrease in accounts payable	0.0	0.0	0.0	-1.7	0.5	1.1
Increase/decrease in other w/c positions	0.0	0.0	0.0	-0.1	0.0	0.0
Increase/decrease in working capital	0.0	0.0	0.0	-0.7	0.3	-5.4
Cash flow from operating activities	**-0.4**	**-1.3**	**-2.8**	**-10.3**	**-30.2**	**-46.7**
CAPEX	-0.4	-1.2	-7.1	-17.9	-576.7	-1,190.8
Payments for acquisitions	0.0	0.0	0.0	0.0	0.0	0.0
Financial investments	-0.0	0.0	0.0	0.0	0.0	0.0
Income from asset disposals	0.0	0.0	0.0	0.0	0.0	0.0
Cash flow from investing activities	**-0.4**	**-1.2**	**-7.1**	**-17.9**	**-576.7**	**-1,190.8**
Cash flow before financing	-0.8	-2.6	-10.0	-28.2	-607.0	-1,237.6
Increase/decrease in debt position	0.0	0.0	-0.0	-0.6	499.0	328.1
Purchase of own shares	0.0	0.0	0.0	0.0	0.0	0.0
Capital measures	0.1	5.6	118.3	245.1	706.8	615.2
Dividends paid	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.0	0.0	0.0	0.0	0.0	0.0
Effects of exchange rate changes on cash	0.0	-0.0	0.0	0.0	0.0	0.0
Cash flow from financing activities	**0.1**	**5.6**	**118.3**	**244.6**	**1,205.8**	**943.3**
Increase/decrease in liquid assets	-0.7	3.1	108.3	216.3	598.8	-294.3
Liquid assets at end of period	**3.3**	**6.4**	**114.7**	**331.0**	**929.8**	**635.6**

Source: Company data; AlsterResearch

Regional sales split (AUDm)	2019	2020	2021	2022E	2023E	2024E
Domestic	0.0	0.0	0.0	4.8	9.1	17.3
Europe (ex domestic)	0.0	0.0	0.0	0.0	0.0	0.0
The Americas	0.0	0.0	0.0	0.0	0.0	0.0
Asia	0.0	0.0	0.0	0.0	0.0	0.0
Rest of World	0.0	0.0	0.0	0.0	0.0	0.0
Total sales	**0.0**	**0.0**	**0.0**	**4.8**	**9.1**	**17.3**

Regional sales split (common size)	2019	2020	2021	2022E	2023E	2024E
Domestic	na	na	na	100.0%	100.0%	100.0%
Europe (ex domestic)	na	na	na	0.0%	0.0%	0.0%
The Americas	na	na	na	0.0%	0.0%	0.0%
Asia	na	na	na	0.0%	0.0%	0.0%
Rest of World	na	na	na	0.0%	0.0%	0.0%
Total sales	**na**	**na**	**na**	**100%**	**100%**	**100%**

Source: Company data; AlsterResearch

AlsterResearch

Ratios	2019	2020	2021	2022E	2023E	2024E
Per share data						
Earnings per share reported	-0.03	-0.07	-0.12	-0.07	-0.21	-0.27
Cash flow per share	-0.02	-0.03	-0.04	-0.08	-0.19	-0.29
Book value per share	0.12	0.18	1.48	2.81	7.21	10.03
Dividend per share	0.00	0.00	0.00	0.00	0.00	0.00
Valuation						
P/E	-340.8x	-121.9x	-72.9x	-120.8x	-42.2x	-32.7x
P/CF	-439.2x	-267.6x	-244.6x	-112.1x	-47.5x	-30.9x
P/BV	75.2x	48.7x	6.1x	3.2x	1.2x	0.9x
Dividend yield (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF yield (%)	-0.2%	-0.4%	-0.4%	-0.9%	-2.1%	-3.2%
EV/Sales	na	na	Infinityx	171.8x	80.6x	78.1x
EV/EBITDA	-1,916.2x	-349.1x	-99.8x	-58.6x	-51.5x	-122.8x
EV/EBIT	-1,298.7x	-321.3x	-96.5x	-58.4x	-50.6x	-97.8x
Income statement (AUDm)						
Sales	0.0	0.0	0.0	4.8	9.1	17.3
yoy chg in %	na	na	na	Infinity%	87.5%	90.9%
Gross profit	0.0	0.0	0.0	2.6	4.5	7.2
Gross margin in %	na	na	NaN%	53.1%	50.0%	41.3%
EBITDA	-0.6	-3.3	-10.5	-14.2	-14.2	-11.0
EBITDA margin in %	na	na	-Infinity%	-293.0%	-156.6%	-63.6%
EBIT	-0.9	-3.6	-10.9	-14.3	-14.5	-13.8
EBIT margin in %	na	na	-Infinity%	-294.3%	-159.3%	-79.8%
Net profit	-0.8	-3.6	-10.7	-9.6	-30.7	-44.1
Cash flow statement (AUDm)						
CF from operations	-0.4	-1.3	-2.8	-10.3	-30.2	-46.7
Capex	-0.4	-1.2	-7.1	-17.9	-576.7	-1,190.8
Maintenance Capex	0.3	0.3	0.4	0.1	-2.9	0.0
Free cash flow	-0.8	-2.6	-10.0	-28.2	-607.0	-1,237.6
Balance sheet (AUDm)						
Intangible assets	0.5	2.6	14.4	15.7	13.9	12.5
Tangible assets	0.0	0.0	1.5	18.0	596.3	1,785.7
Shareholders' equity	3.8	8.9	129.0	364.5	1,040.5	1,611.7
Pension provisions	0.0	0.0	0.0	0.0	0.0	0.0
Liabilities and provisions	0.0	0.0	0.6	0.0	499.0	827.1
Net financial debt	-3.3	-6.4	-114.1	-331.0	-430.8	191.5
w/c requirements	-0.1	-0.1	-0.9	-0.3	-0.5	4.9
Ratios						
ROE	-22.1%	-40.0%	-8.3%	-2.6%	-3.0%	-2.7%
ROCE	-23.5%	-40.5%	-8.4%	-3.9%	-0.9%	-0.6%
Net gearing	-88.3%	-72.3%	-88.5%	-90.8%	-41.4%	11.9%
Net debt / EBITDA	5.5x	1.9x	10.9x	23.3x	30.3x	-17.4x

Source: Company data; AlsterResearch

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Company	Disclosure
Vulcan Energy Resources	2, 8

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Contacts

SRH AlsterResearch AG
Himmelstr. 9
22299 Hamburg

Tel: +49 40 309 293-52
Fax: +49 40 556 330-54
E-Mail: info@alsterresearch.com

Research

HANNAH GABERT
Team Assistant
Tel: +49 40 309 293-53
E-Mail: h.gabert@alsterresearch.com

HARALD HOF
Senior Analyst
Tel: +49 40 309 293-52
E-Mail: h.hof@alsterresearch.com

NIKOLAI RENKEN
Analyst
Tel: +49 40 309 293-54
E-Mail: n.renken@alsterresearch.com

KATHARINA SCHLÖTER
Analyst
Tel: +49 40 309 293-52
E-Mail: k.schloeter@alsterresearch.com

THOMAS WISSLER
Senior Analyst
Tel: +49 40 309 293-58
E-Mail: t.wissler@alsterresearch.com

DR. OLIVER WOJAHN, CFA
Senior Analyst
Tel: +49 40 309 293-58
E-Mail: o.wojahn@alsterresearch.com

ALEXANDER ZIENKOWICZ
Senior Analyst
Tel: +49 40 309 293-56
E-Mail: a.zienkowicz@alsterresearch.com

Sales

MARKUS KÖNIG-WEISS
Head of Sales
Tel: +49 40 309 293-52
E-Mail: mkw@alsterresearch.com

mwb fairtrade Wertpapierhandelsbank AG
Rottenbucher Straße 28
82166 Gräfelfing

Tel: +49 89 85852-0
Fax: +49 89 85852-505
E-Mail: info@mwbfairtrade.com

Equity Capital Markets / Trading

KAI JORDAN
Member of the Board
Tel: +49 40 36 0995-22
E-Mail: kjordan@mwbfairtrade.com

ALEXANDER DEUSS
Head of Institutional Sales
Tel: +49 40 36 0995- 22
E-Mail: adeuss@mwbfairtrade.com

SASCHA GUENON
Head of Designated Sponsoring
Tel: +49 40 360 995 - 23
E-Mail: sguenon@mwbfairtrade.com

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