

## Quarterly Activities Report March 2022

Vulcan Energy Resources Limited (Vulcan; ASX: VUL, FSE: VUL, the Company) continued to execute on its plan to build a fully integrated renewable energy and battery-quality lithium chemicals project with net zero carbon footprint in Europe, realising significant project milestones during the March 2022 Quarter (the Quarter).

### Highlights

- Entered into an agreement with major chemicals company Nobian (previously part of AkzoNobel) to assess the feasibility of a joint project for the development, construction and operation of the Central Lithium Plant (CLP) after securing the site for the CLP in October 2021.
- Pre-fabrication of Vulcan's Direct Lithium Extraction (DLE) - Demonstration Plant (Demo Plant) commenced offsite in Germany.
- Opened new laboratory in Karlsruhe-Durlach, Germany, extending the analytical capability and expertise of the Company's lithium division.
- Awarded new exploration licenses for geothermal energy and lithium in the Upper Rhine Valley Geothermal Brine Field, increasing Vulcan's granted license area by nearly 50% to over 1,000km<sup>2</sup>.
- Granted a new Research Permit in Italy, named "Cesano", with high geothermal heat and high lithium grades recorded in historical drilling. Vulcan considers the area to have potential for sustainable lithium battery chemicals development.
- Signed a binding lithium hydroxide offtake agreement with LG Energy Solution (LGES), following the binding term sheet signed on 18 July 2021.
- Strong financial position maintained, with the cash balance and liquid investments totalling €141 million at the end of March 2022. Capitalising on the Feed in Tariff for geothermal power, Vulcan's operational geothermal renewable energy plant, Natürlich Insheim generated €1.7 million in revenue.
- Commenced trading on the Prime Standard regulated market of the Frankfurt Stock Exchange (FSE), following the submission of the application to dual list on 8 February 2022, the first ASX-listed company to do so.
- Appointed experienced German chemicals and renewable energy leader, Dr Günter Hilken, to Vulcan's Board of Directors. Mr. Mark Skelton, ex-Fortescue and ex-BP Project Director and experienced major project execution advisor was also appointed to the Board, subsequent to the quarter.

### Subsequent events post-Quarter:

- Vulcan and MVV Energie AG (MVV), the largest municipal energy supplier in Germany, executed a binding purchase agreement for 240 gigawatt hours per year of renewable heat for the next 20 years.

### Contact

Vulcan's Manager Director Dr. Francis Wedin commented: "Vulcan was founded with the purpose of decarbonising battery metals for e-mobility with the co-production of renewable heat and power. Our binding offtake agreement with MVV, the largest municipal energy supplier in Germany, is an important step in this journey. In addition, as a commercial-scale renewable energy producer already, Vulcan is committed to playing a leading role in Germany's "Wärmewende", or heat transition, and this agreement represents a real and immediate step taken by a German energy utility to achieve energy security whilst not compromising on climate goals.

"Our lithium team are leaders in their field. The Zero Carbon Lithium™ Project is an opportunity to leverage decades of knowledge in Direct Lithium Extraction (DLE) techniques to unlock sustainable lithium sources. To that end, it is pleasing to see Vulcan's operational DLE Pilot Plant reporting consistent lithium concentration and low level of impurities, together with lithium recovery rates averaging 94-95%. The DLE-Demo Plant, scheduled for completion later this year, will be vital in enhancing the operational expertise of the team, while further de-risking the technical aspects of the project. We are making good progress on this, albeit we are seeing global supply disruptions affect equipment delivery times.

"We are increasing our engagement with the community, as we seek to build trust and understanding in the regions in which we plan to operate. Our dual listing on the regulated market of the Frankfurt Stock Exchange is part of our concerted strategy to foster widespread public acceptance of our project in the Upper Rhine Valley.

"We are swiftly capitalising on strategic opportunities to ensure timely project development. The recent appointment of Dr Günter Hilken and Mr Mark Skelton complement the existing key skills of our Board, at this critical juncture in our project development. I would like to thank the entire Vulcan team for their unwavering commitment to the Zero Carbon Lithium™ Project, as we remain focused on delivering the Definitive Feasibility Study (DFS) in the second half of the year, ahead of our targeted phase one commercial lithium production in 2024."

### Exploration and development

Strategically located in Europe, Vulcan has the largest lithium resource at the centre of the fastest growing lithium-ion battery market in the world. The Company is aiming to increase the future supply of its sustainable lithium chemical product in response to significant customer demand.

During the period, the Company was awarded new exploration licenses for geothermal energy and lithium in the Upper Rhine Valley Geothermal Brine Field, stepping out from its area already in production for geothermal energy. The new licenses increased Vulcan's granted license area by nearly 50% to over 1,000km<sup>2</sup>. The team has been focused on reviewing existing data and adding to Vulcan's project development pipeline with the view to launch a drilling campaign at the end of 2022 to grow renewable energy production and lithium production.

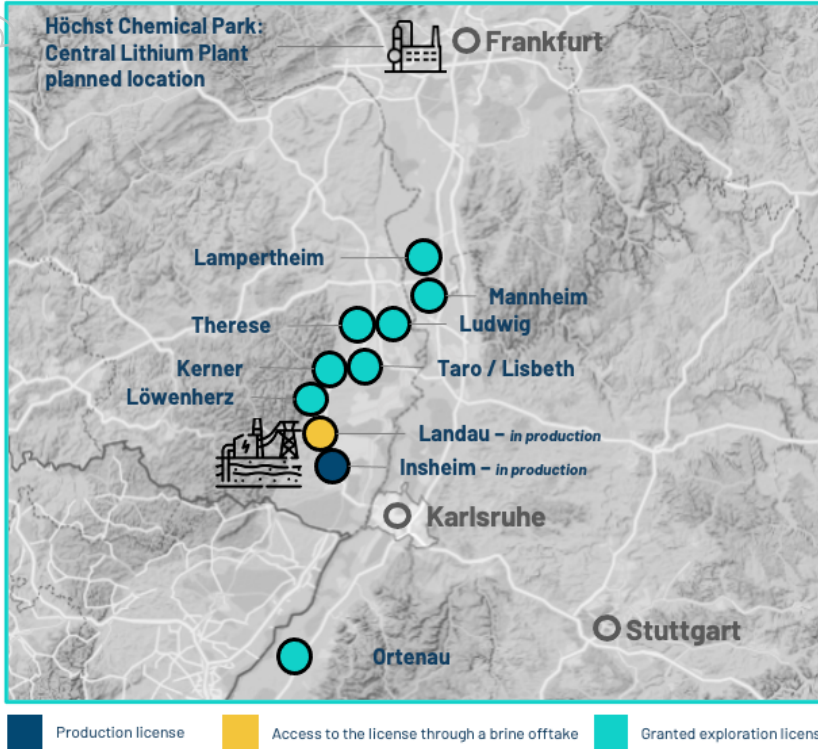
In addition, Vulcan subsidiary Vulcan Energy Italy Pty Ltd was granted the Cesano Permit, in Italy. The Cesano Permit extends over an area of 11.5 km<sup>2</sup> and includes an area where a single geothermal well yielded two "hot brine" samples that contained high average lithium-in-brine historical (1976) grades of 350 and 380 mg/l Li. Vulcan is working with local partners to ascertain the potential of the area in more detail, and ascertain next steps. By growing and diversifying Vulcan's project development portfolio - an initiative internally called "Project Rollo" - the Company aims to develop a global Zero Carbon Lithium™ business focused on Europe, and to become a significant producer of renewable energy and sustainable lithium for electric vehicles. Vulcan is also looking at medium to longer-term opportunities on the French side of the Upper Rhine Valley.



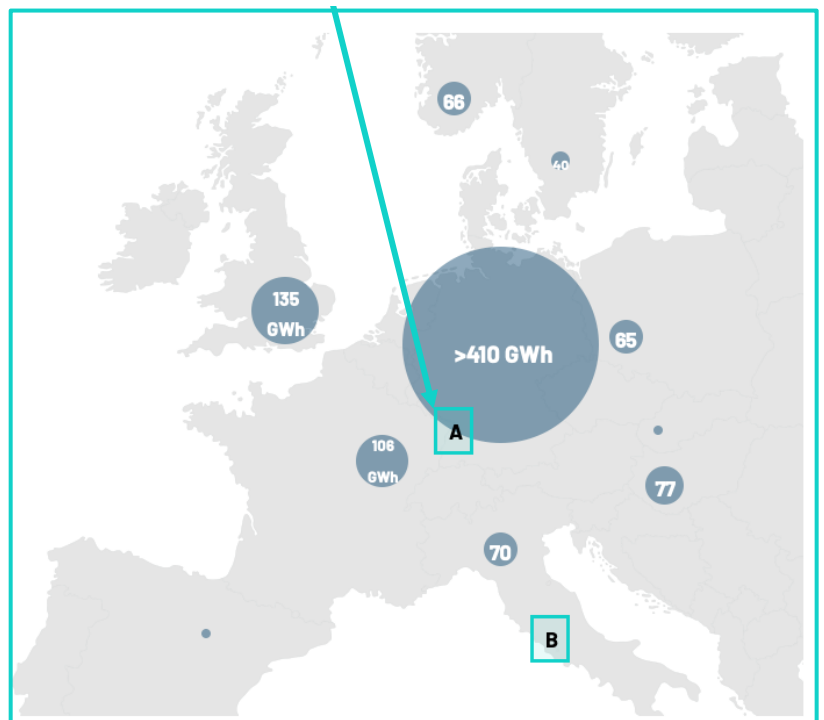
# VULCAN ENERGY ZERO CARBON LITHIUM™

## Vulcan Zero Carbon Lithium™ Project Granted Licenses

Largest lithium resource in Europe: 15.85Mt LCE<sup>1</sup>



## Planned European battery manufacturing projects in GWh capacity - 11/2021



Location of A) Vulcan's Zero Carbon Lithium Project in the Upper Rhine Valley, Germany, in relation to B) the granted Research Permit in Italy.

### Renewable energy and geothermal division

Building on the landmark acquisition of the Insheim geothermal renewable energy power plant (renamed Natürlich Insheim) in December 2021, Vulcan has formally taken over operations of the facility. The plant currently has the technical ability to produce a maximum of 4.8MW renewable power, equivalent to the power usage of approximately 8,000 households, with an additional ability to produce heating. Vulcan has commenced discussions with local stakeholders to expand operations to provide heating and energy security to local communities.

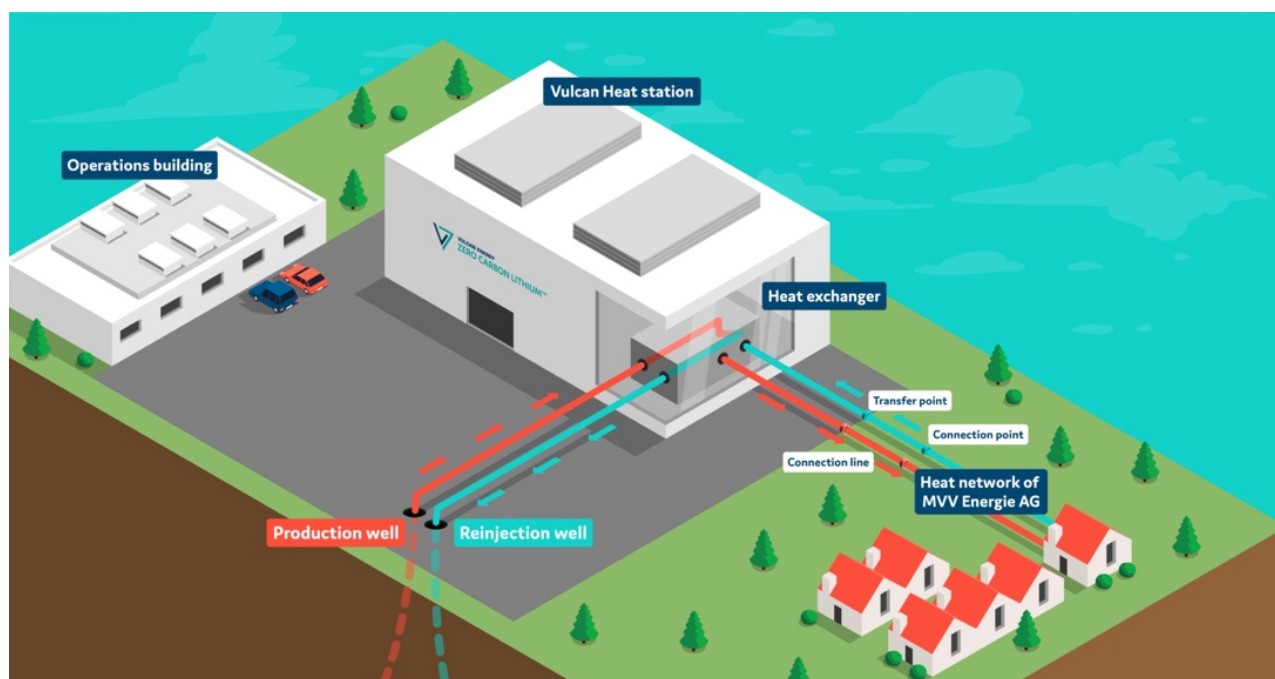


*Vulcan's Natürlich Insheim geothermal renewable energy plant, currently in commercial production.*

During the previous Quarter, Vulcan acquired two electric drill rigs as part of the Company's Zero Carbon Lithium™ Project. The specialised rigs can drill to the target depth required for deep geothermal energy wells in the Upper Rhine Valley, Germany. The deep geothermal rigs represent a scarce, strategic asset for Vulcan, as Europe navigates an energy crisis and the increasing need for renewable heating. The electric rigs will ensure drilling can be conducted with minimum greenhouse gas emissions, consistent with Vulcan's strict carbon neutral focus. During the Quarter, Vulcan's in-house drilling company, Vercana, was focused on the continued refurbishment of the acquired rigs, targeting operational readiness by the end of the year.



Subsequent to the reporting period, Vulcan signed a binding agreement with MVV Energie AG (MVV) for the supply of renewable, zero carbon heat. MVV is the largest municipal energy supplier in Germany and the 20-year agreement includes the supply of a minimum of 240,000MWh per year to a maximum of 350,000MWh per year to 35,000 households in Mannheim, outside of Frankfurt, Germany. Vulcan is developing its Mannheim licence as part of a planned larger Phase 2 of the Zero Carbon Lithium™ Project. The Company intends to build several further distributed geothermal renewable energy plants across the Upper Rhine Valley region and is in discussions with other regional communities regarding additional heat offtake agreements.



*A representation of the heat transfer from geothermal renewable energy plant to heat network. Heat will be transferred via heating grids and a series of underground pipes that deliver hot water or steam to buildings in the local community.*

### Zero Carbon Lithium™ division

In January 2022, Vulcan signed an agreement with Nobian, the fourth largest chlor-alkali producer in Europe, formerly part of Nouryon (AkzoNobel). This agreement bolsters the operational experience and expertise in electrolysis production within the Zero Carbon Lithium™ Project team. Advantageously, one of Nobian's operations is located at the Höchst chemical park near Frankfurt, where Vulcan has secured a plot for the construction of its CLP. Noting that Nobian's chlor-alkali production uses an electrolysis process which is similar to part of Vulcan's flowsheet, both companies are working together on the electrochemical conversion process of lithium chloride to battery quality lithium hydroxide.

A priority for Vulcan's lithium division is the construction and commissioning of the DLE-Demo Plant, which is progressing well. The design work has been finalised and off-site pre-fabrication of the plant started in February 2022. Start of commissioning of the plant is expected around mid-year, likely in early Q3, with the team experiencing some supply disruptions related to the global geopolitical situation.

The lithium hydroxide production Demo Plant, (CLP-Demo Plant) also known as “LiLy”, is progressing concurrently, with 95% of the required equipment ordered ahead of commissioning, which is expected to start Q1 '23, with some delivery delays experienced by the purchasing team linked to current supply chain issues related to the global geopolitical situation.

Both the DLE-Demo Plant and CLP-Demo Plant will provide important operational learnings prior to Vulcan's planned start of phase 1 commercial production in 2024. When it comes to expanding the Demo Plants to their commercial size, the DLE commercial plant represents a very manageable scale-up factor of only 1:50 in terms of column size, as each DLE plant will be operating 4 trains of extraction units. Meanwhile, the commercial CLP electrolysis cells won't have a scale up factor but a multiplication factor, as electrolysis cells are not scaled up further but multiplied.



*Vulcan's DLE Demo Plant under construction, and a 3D image of the Demo Plant design.*



Vulcan opened its new laboratory in Karlsruhe-Durlach, Germany in February 2022 which will be used to deepen the team's understanding of the lithium processing and to optimise the process to inform the Definitive Feasibility Study (DFS).



The laboratory supports the work of the Pilot Plant, which is reporting consistent lithium concentration and low level of impurities. Lithium recovery rates are averaging 94-95%, above the levels noted in the 2021 Pre-Feasibility Study. The Pilot Plant has been successfully running for over a year since operations commenced in April 2021.



## Financial position

The Company maintains a strong financial position following the A\$200million placement in September 2021. The cash balance (€116 million) together with liquid investments (€25 million) totalled €141 million at the end of March 2022. During the quarter the Company took advantage of the appreciation of the Australian dollar by converting some of the recent placement funds to Euros, given the majority of Vulcan's operating and capital expenses are Euro denominated.

Revenue received during the quarter principally related to Natürlich Insheim, the Insheim geothermal renewable energy power plant, (€1.7 million plus VAT) which Vulcan took control of effective 31 December 2021. The plant capitalises on the Feed in Tariff for geothermal power.

Cash outlays during the quarter related to:

- DFS engineering,
- Off-site fabrication costs and purchase of technical equipment related to the construction of the DLE-Demo Plant,
- Insheim power plant production costs,
- Initial refurbishment costs relating to recently acquired electric drill rigs; and
- Corporate costs including Frankfurt listing costs.

## Sustainability and team growth

As a zero-carbon business, Vulcan is focused on ensuring its sustainability goals are not merely aspirations but govern the way Vulcan operates in practice, both now and in the future. The Company's public ESG strategy is being finalised, and enhanced reporting frameworks are being implemented ahead of publishing the Annual Sustainability Report later this year.

Proudly disruptive, Vulcan's diverse team comes from all over the globe, united by a passion for environmentalism and science. The Vulcan team continues to grow across geothermal renewable energy and lithium battery chemicals business units, and now totals approximately 110 people. Demonstrating the Company's commitment to diversity, women represent 35% of the workforce, while Vulcan's Board of Directors is balanced with 50/50 male and female directors.

Over the last two months, Vulcan appointed two new Non-Executive Directors to the Board. Dr Günter Hilken, appointed in March 2022, has over 35 years' experience in and a deep understanding of the German chemicals, renewables and infrastructure investment sectors and, through leading industry advocacy associations, the German Government at the State and Federal level. Mr Mark Skelton was appointed in April 2022. Currently a project development and execution consultant to companies in the lithium, energy and infrastructure industries, Mr Skelton has worked with companies from concept through to execution. Dr Hilken and Mr Skelton's appointments complement the key skills of the existing Vulcan board, ensuring that Vulcan has the right team to not only deliver for its shareholders, but to assist Europe to transition away from Russian gas supplies as soon as possible, whilst maintaining a strong ESG focus.



Stakeholder engagement and community and public relations are an important part of Vulcan's project development. The Company has support from many federal politicians as it highlights the positive social and environmental impacts that the Zero Carbon Lithium™ Project can bring at a regional level including renewable energy and heat, local employment and locally sourced lithium for the electric vehicle industry. During the period, the team hosted Dr. André Baumann, State Secretary Baden-Wuerttemberg Green Party; Zoe Mayer, Member of the German Bundestag Green Party and Alexander Salomon, Member of the Landtag Green Party at the Company's operations in Karlsruhe and Insheim where they were given a tour of the lab and geothermal power plant tour.

Engagement with the community members, local and municipal councils, as well as regional media, continues to expand, the centrepiece being an information road show through the South Palatine Region of Germany. Focusing on communities that reside in the areas Vulcan plans to operate including Insheim and Landau, the road shows are an opportunity for community members to meet with the Vulcan team, including German Executive Director Dr Horst Kreuter and Chief Operating Officer Thorsten Weimann.



The opening of Vulcan's community information centres is progressing, with shopfronts in Insheim, Landau and Karlsruhe launching in coming months, followed by Mannheim and Bühl. The 'Infocentres' ensure Vulcan has a tangible presence in the communities where it seeks to operate, while providing locals with the opportunity to ask questions and understand the benefits Vulcan and the energy transition can bring to their community.

### Additional ASX Disclosure Information

ASX Listing Rule 5.3.1: Exploration and Evaluation expenditure during the Quarter was €2.4 million. Expenditure was on engineering studies towards the DFS for the Vulcan Zero Carbon Lithium™ Project, the interpretation of existing 3D seismic and planning for 3D seismic surveys in its license areas. Interpretation costs include capitalised costs from GeoThermal Engineering GmbH (GeoT), where time was allocated to Vulcan license areas.

ASX Listing Rule 5.3.2: Development expenditure during the Quarter was €1.6 million. Expenditure related to the off-site pre-fabrication for the DLE-Demo Plant as well as design engineering costs and purchase of technical equipment relating to the plant. Design engineering costs include capitalised costs from Global Engineering and Consulting GmbH (gec-co) where time was dedicated to Vulcan's DLE-Demo Plant.

ASX Listing Rule 5.3.3: Four exploration licenses in the Upper Rhine Valley were granted in January 2022 (refer to ASX Announcement 4 January 2022 for more information). Vulcan subsidiary Vulcan Energy Italy Pty Ltd was also granted a new Research Permit in Italy in January 2022 (refer to ASX Announcement 24 January 2022 for more information).

ASX Listing Rule 5.3.5:

Payments to related parties of the Company and their associates during the Quarter per Section 6.1 of the Appendix 5B total €94,000. This is comprised of an allocation of the Managing Director remuneration of €14,000, Non-Executive Director fees of €71,000 as well as consulting fees of €9,000 to Alto Group Inc., a company related to one of the Non-Executive Directors. Please see the Remuneration Report in the Annual Report for further details on Director's Remuneration.

Payments to related parties of the Company and their associates during the Quarter per Section 6.2 of the Appendix 5B total €55,000. This amount is an allocation of the Managing Director's remuneration for work done on exploration activities associated with the Vulcan Zero Carbon Lithium™ Project. Please see the Remuneration Report in the Annual Report for further details on Director's Remuneration.

### Vulcan Zero Carbon Lithium™ Project Granted Licenses

Name	State	Area (ha)	Area (km <sup>2</sup> )	Type	Expiry date (MM/YYYY)	Ownership at End of Quarter	Change in Ownership
Upper Rhine Valley Geothermal-Lithium Brine Field							
Insheim	Rheinland-Pfalz	1,900	19	Production license	11/2037	100%	0%
Ortenau	Baden-Württemberg	37,360	373.6	Exploration License	06/2023	100%	N/A
Mannheim	Baden-Württemberg	14,427	144.27	Exploration License	06/2024	100%	N/A
Lampertheim	Hessen	10,803	108.03	Exploration License	07/2024	100%	N/A
Taro/Lisbeth	Baden-Württemberg	3,268	32.68	Exploration License	08/2022	100%	N/A
Ludwig	Rheinland-Pfalz	9,641	96.41	Exploration License	12/2024	100%	100%
Therese	Rheinland-Pfalz	8,109	81.09	Exploration License	12/2024	100%	0%
Kerner	Rheinland-Pfalz	7,226	72.26	Exploration License	12/2024	100%	0%
Löwenherz	Rheinland-Pfalz	7,543	75.43	Exploration License	12/2024	100%	0%
Landau	Rheinland-Pfalz	19,4937	194.94	Production license	N/A	Brine offtake agreement with owner/operator	
Cesano Field							
Cesano	Italy	1150	11.5	Research Permit	01/2025	100%	100%





**VULCAN ENERGY**

**ZERO CARBON LITHIUM™**

### About Vulcan

Vulcan is aiming to become the world's first lithium producer with net zero greenhouse gas emissions. Its Zero Carbon Lithium™ Project intends to produce a battery-quality lithium hydroxide chemical product from its combined geothermal energy and lithium resource, which is Europe's largest lithium resource, in Germany. Vulcan's unique, Zero Carbon Lithium™ Project aims to produce both renewable geothermal energy, and lithium hydroxide, from the same deep brine source. In doing so, Vulcan intends to address lithium's EU market requirements by reducing the high carbon and water footprint of production, and total reliance on imports. Vulcan aims to supply the lithium-ion battery and electric vehicle market in Europe, which is the fastest growing in the world. The Vulcan Zero Carbon Lithium™ Project has a resource which could satisfy Europe's needs for the electric vehicle transition, from a source with net zero greenhouse gas emissions, for many years to come.



### Corporate Directory

Managing Director	Dr Francis Wedin
Chairman	Gavin Rezos
Non-Executive Director	Ranya Alkadamani
Non-Executive Director	Annie Liu
Non-Executive Director	Dr Heidi Grön
Non-Executive Director	Josephine Bush
Non-Executive Director	Dr Günter Hilken
Non-Executive Director	Mark Skelton
Executive Director, Germany	Dr Horst Kreuter
Company Secretary	Daniel Tydde

### For and on behalf of the Board

Daniel Tydde | Company Secretary

### Media and Investor Relations contact

Germany:

Beate Holzwarth, Chief Communications Officer | [bholzwarth@v-er.eu](mailto:bholzwarth@v-er.eu) | + 49 (0) 171 440 7844

Australia:

Jessica Bukowski, PR & IR Manager | [jbukowski@v-er.eu](mailto:jbukowski@v-er.eu) | +61 (0) 420 528 355

### Reporting calendar

March Quarterly Activities and Cashflow Reports	28 April 2022
June Quarterly Activities and Cashflow Reports	28 July 2022
FY22 Results	15 September 2022
September Quarterly Activities and Cashflow Reports	27 October 2022

## Disclaimer

Some of the statements appearing in this announcement may be in the nature of forward-looking statements. You should be aware that such statements are only predictions and are subject to inherent risks and uncertainties. Those risks and uncertainties include factors and risks specific to the industries in which Vulcan operates and proposes to operate as well as general economic conditions, prevailing exchange rates and interest rates and conditions in the financial markets, among other things. Actual events or results may differ materially from the events or results expressed or implied in any forward-looking statement. No forward-looking statement is a guarantee or representation as to future performance or any other future matters, which will be influenced by a number of factors and subject to various uncertainties and contingencies, many of which will be outside Vulcan's control.

Vulcan does not undertake any obligation to update publicly or release any revisions to these forward-looking statements to reflect events or circumstances after today's date or to reflect the occurrence of unanticipated events. No representation or warranty, express or implied, is made as to the fairness, accuracy, completeness or correctness of the information, opinions or conclusions contained in this announcement. To the maximum extent permitted by law, none of Vulcan, its Directors, employees, advisors or agents, nor any other person, accepts any liability for any loss arising from the use of the information contained in this announcement. You are cautioned not to place undue reliance on any forward-looking statement. The forward-looking statements in this announcement reflect views held only as at the date of this announcement.

This announcement is not an offer, invitation or recommendation to subscribe for, or purchase securities by Vulcan. Nor does this announcement constitute investment or financial product advice (nor tax, accounting or legal advice) and is not intended to be used for the basis of making an investment decision. Investors should obtain their own advice before making any investment decision.

### Competent Person Statement:

The information in this report that relates to Mineral Resources and Ore Reserves (respectively) of the Company's Zero Carbon Lithium™ is extracted from the ASX announcements made by Vulcan on 15 December 2020 ("Updated Ortenau Indicated and Inferred Resource") and 15 January 2021 ("Positive Pre-Feasibility Study"), which are available on [www.v-er.eu](http://www.v-er.eu). The information in this report that relates to Insheim's Mineral Resources is extracted from the ASX announcement made by Vulcan on 20 January 2020 ("Maiden Indicated Resource Insheim Vulcan Zero Carbon Lithium"), which is available on [www.v-er.eu](http://www.v-er.eu). The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcements and that all material assumptions and technical parameters underpinning the estimates in the relevant market announcements continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcements.