

Vulcan Energy Resources Ltd. Quarterly Activities Report for the period ending 30 September 2024

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During the period ending 30 September 2024 (the Quarter)

[Vulcan Energy Resources Ltd.](#) (Vulcan, ASX: VUL, FSE: VUL, the Company) achieved significant progress to further advance Phase One of its integrated renewable energy and ZERO CARBON LITHIUM™ Project (the Project), designated "Lionheart".

Highlights from the Quarter

- Start of commissioning at downstream Central Lithium Electrolysis Optimisation Plant (CLEOP), located in Industrial Park Höchst, Frankfurt, where Vulcan will also construct its commercial Central Lithium Plant (CLP)
- Agreement signed to finalise the consolidation of the Company's ownership of upstream Phase One lithium and renewable energy assets. The conditional 100% acquisition of geox GmbH (Geox) replaces a JV agreement and will allow for more efficient operation of Phase One, alongside Vulcan's other upstream operations
- Appointment of Mr Angus Barker as Non-Executive Director to the Board of Directors. Mr Barker has more than 30 years' professional experience with significant expertise in mergers and acquisitions, capital markets, and strategic advisory
- The Environmental and Social Impact Assessment (ESIA) was updated and published in conjunction with leading sustainability consultant, ERM. The Company also appointed leading global financial institution, Natixis CIB, as its ESG Coordinator, with an aim to secure the first ever green financing with green enabling features
- Granting of the Company's first lithium and geothermal energy licences in the Mulhouse, Alsace region of France. The licences authorise Vulcan to explore for lithium to support Europe's electric vehicle (EV) transition and for geothermal energy for the decarbonisation of industry and local community heating.

Highlights of subsequent events

- Progress was made on the financing of Phase One of Vulcan's Project, with an updated debt package issued to the structuring group and a wider lending pool of other commercial banks
- Vulcan and AVEVA entered into a Memorandum of Understanding (MoU) on 15 October 2024 to allow the Company to leverage AVEVA's digital expertise. The MoU will establish a digital backbone for the Project, and highlights both companies' commitment to sustainability and digital transformation across industrial asset lifecycles.

Managing Director and CEO, Cris Moreno, commented: "The Q3 reporting period continued the momentum Vulcan has built over the course of the year to date, and we are pleased with ongoing progress. The start of commissioning at our downstream optimisation plant was a particular highlight during the period as this signifies Vulcan being one step closer to producing Europe's first fully domestically produced lithium hydroxide. We are anticipating a strong end to calendar year 2024, with a number of pivotal commercial and operational developments underway, including related to Phase One financing, and look forward to updating the market and our shareholders in due course."

Health and safety

- There was one recordable Lost Time Injury (LTI) during the reporting period which occurred at the Company's in-house geothermal drilling company, Vercana. It is the only LTI reported during the past 12 months.

Integrated renewable energy and lithium production

Renewable energy operations

- Operations continued at Vulcan's Natürlich Insheim geothermal renewable energy plant with production of approximately 4,000MWh of gross baseload, renewable power, at an average selling price of $\text{€}0.252/\text{kWh}$, with $\text{€}1$ million gross revenue generated
- The GEOSMART Project concluded during the reporting period. Co-funded by the European Union, Vulcan Energy, and 18 other partners from across Europe, the GEOSMART Project was established to develop and demonstrate solutions for the geothermal energy sector. As part of the initiative, the Company installed a thermal energy storage system in September 2024 at the Natürlich Insheim geothermal renewable energy plant, designed to deliver reliable, baseload geothermal renewable heating to local communities.

Figure 1 Thermal energy storage system installed at Vulcan's Natürlich Insheim geothermal renewable energy plant for the GEOSMART project.

Well site preparation and rig readiness

- The Special Operation Plan for the drilling and monitoring of the first new wells at the Phase One Schleidberg site was approved by the mining authority during the reporting period. Preparatory works at the site are ongoing, with the well pad and crew camp construction also completed during the reporting period
- Vulcan's V20 drill rig is in place ready for mobilisation, and the refurbishment of Vulcan's V10 drill rig is in the final stage.

Lithium Extraction Optimisation Plant (LEOP)

- LEOP continued to deliver strong results using VULSORB®, Vulcan's internally developed aluminate-based sorbent, that shows consistently high performance in the Adsorption-type Direct Lithium Extraction (A-DLE) unit
- 40% LiCl quality achieved throughout the reporting period which allowed for the transfer of the lithium concentrate to CLEOP for commissioning.

Figure 2 A-DLE unit at Vulcan's downstream lithium optimisation plant.

Central Lithium Electrolysis Optimisation Plant (CLEOP)

- On 8 August 2024, the Company started commissioning at its downstream lithium hydroxide optimisation plant, CLEOP, located in the Industrial Park Höchst, where Vulcan will also construct its CLP
- The main building and utility systems were completed which allowed for first energisations to take place, and power was fed to the plant for the first time through the main switchboard

- CLEOP is the Company's pre-commercial downstream optimisation plant. At CLEOP, LiCl solution produced from Vulcan's 100%-owned upstream operations will be converted to battery specification LHM, allowing for qualification with customers
- Vulcan will use the CLEOP facility to train personnel and optimise processes in a pre-commercial setting ahead of construction of the commercial CLP.

Phase One execution readiness

- Progress continued on Phase One execution readiness, including engineering works and permitting for remaining Phase One areas
- EPCm validation is ongoing with results expected in Q4 2024.

Geox acquisition

- On 27 September 2024, the Company signed an agreement to finalise the consolidation of Vulcan's ownership of upstream Phase One lithium and renewable energy assets to align with the completion of its Phase One financing
- The conditional 100% acquisition of Geox, owner and operator of geothermal wells, renewable energy generation assets and a geothermal and lithium licence around the City of Landau, co-located with Vulcan's upstream lithium optimisation plant, replaces a JV agreement and will allow for more efficient operation of Phase One, alongside Vulcan's other upstream operations
- Vulcan currently estimates 20% of Phase One upstream brine production will come from this licence area
- Vulcan has previously tested its pilot plant on the Geox wells to successfully produce lithium chloride from the brine
- The assets will be used as part of Vulcan's wider upstream Phase One Project, to produce lithium for conversion into battery chemicals and to produce renewable heat and power for local consumers.

Figure 3 Geox geothermal power plant in the City of Landau.

Commercial and financing

Evolution of Board

- On 13 September 2024, the Company announced several changes to its Board in preparation for the Company transitioning to the execution phase of the Project
- Mr Angus Barker, joined the Board as Non-Executive Director, effective 13 September 2024
- Longest-serving non-executives Mr Gavin Rezos, Ms Annie Liu and Ms Ranya Alkadamani also announced their planned retirement from the Board. Ms Liu stepped down as Non-Executive Director, effective 13 September 2024, with Non-Executive Deputy Chair, Gavin Rezos, and Non-Executive Director, Ranya Alkadamani, set to retire from the Board on 31 December 2024.

Appointment of Natixis CIB as coordinator for first green-enabling financing

- On 31 July 2024, the Company appointed leading global financial institution, Natixis CIB, as its ESG Coordinator, with an aim to secure the first ever green financing with green enabling features
- The financing is structured to be labelled as green, in line with the Loan Market Association's Green Loan Principles and the International Capital Market Association (ICMA) Green Enabling Projects Guidance.

~10 million credit facility

- During the reporting period, the Company signed a ~10 million loan agreement with global investment bank BNP Paribas to provide short-term flexibility prior to completion of the equity and debt financing of Phase One of the Project
- The loan agreement, a revolving credit facility over a period of five years, is secured against Natürlich Insheim GmbH, which holds the Company's Natürlich Insheim geothermal power plant. Once drawn down, the funds will be allocated towards general corporate purposes including working capital and preparatory works for the Project and will be repaid upon successful closure of equity and debt financing for the Project.

French licencing approval

- On 19 July 2024, the Company publicised the grant of its first lithium and geothermal energy licences in the Alsace region of France. The licences authorise Vulcan to explore lithium to support Europe's electric vehicle (EV) transition and for geothermal energy for the decarbonisation of industry and local community heating
- The licences are in the Mulhouse, Alsace region on the French side of the Upper Rhine Valley Brine Field (URVBF), which accounts for roughly one third of the Upper Rhine Graben, containing both geothermal energy and lithium-rich brine. The licence area of 463km² expands the Company's total licence area from 1,771km² to 2,234km² in the URVBF between Germany and France
- The licences encompass several large industrial areas with factories and chemical parks in Mulhouse requiring renewable energy and sustainable heating solutions. This includes a factory owned by Stellantis, Vulcan's largest customer and major shareholder. In May 2023, Vulcan and Stellantis agreed to a joint project in France for the potential use of geothermal renewable energy to decarbonise and localise the energy supply for Stellantis' European operations
- Vulcan is already in discussions with potential investment partners surrounding participation in Vulcan's French licences.

Environmental, Social and Governance (ESG)

Updating of Environmental and Social Impact Assessment (ESIA)

- As part of the Company's Phase One financing with international lenders, Vulcan has updated and published its ESIA prepared by leading sustainability consultant, ERM. The ESIA identifies the potential environmental and social impacts of the Project, and defines how the potential impacts will be mitigated, managed, and monitored throughout the design, construction, and operation phases.
- The ESIA is a prerequisite to raising sustainable or green debt finance and is an important third-party validation of the Project's forecasted environmental and social impacts. The ESIA has been published in line with banks' and ECAs' credit committee approval requirements going into Q4
- Significantly, the Project has no potential impact determined as greater than "minor" post mitigation measures and notes several positive impacts to both people and the planet. This supports Vulcan's analysis that the Project has a lower environmental impact in terms of the carbon, water and land footprint, compared to alternative lithium extraction and processing operations
- Public consultation is a fundamental principle under ESIA guidelines, and the Company has informed a number of stakeholders and interested members of the public about the ESIA to ensure the decision-making process is equitable, leads to more sustainable development, and provides better environmental and social outcomes.

Site visits from political representatives

- Throughout the reporting period, several regional political leaders were briefed on the Project's progress during site visits. Notable visitors included the Lord Mayor of Landau, Dr Dominik Geissler and Thomas Gebhart (CDU), member of the German Bundestag, who toured the plant alongside representatives from Herxheim, Rohrbach and Offenbach. Additionally, delegations from the German-Turkish Energy Partnership, the Baden-Württemberg State Institute for the Environment and members of the Rhineland-Palatinate SPD parliamentary group, including representatives from the Economy Working Group, also visited the site

- The Company welcomed Western Australia's Department of Jobs, Tourism, Science and Innovation Director General, Rebecca Brown, to CLEOP in September. Following the tour, Invest and Trade Western Australia officially launched its new German office, aimed at enhancing economic exchange between Western Australia and Germany.

Figure 4 Left to right: Vanessa Rehn, Director of Investment and Trade Western Australia; Felicity Gooding, Group Chief Financial Officer, Vulcan Energy; Rebecca Brown, Director General, Department of Jobs, Tourism, Science and Innovation (JTSI) ; Simone Spencer, Deputy Director General, Strategy and International Engagement, JTSI; Alisza Rott, Business Development Manager, Invest and Trade Western Australia; Annabel Roedhammer, Vice President Communications, Vulcan Energy; Romain Maniaval, Commissioning Manager, Vulcan Energy.

Additional ASX Disclosure Information

ASX Listing Rule 5.3.1: Exploration and Evaluation expenditure during the Quarter was ~3.4 million. Expenditure related to the developed in-house sorbent, planning for the upcoming project execution and interpretation costs. Interpretation costs include capitalised costs from Vulcan Energy Subsurface (VES) and Vulcan Energie Ressourcen GmbH staff costs where time was allocated to Vulcan licence areas.

ASX Listing Rule 5.3.2: Development expenditure during the Quarter was ~10.0 million. Expenditure predominately related to Schleidberg wellsite preparation (~2.3m), refurbishment costs for Vulcan's two electric drill rigs (~1.9 million), construction of the Central Lithium Electrolysis Optimisation Plant (~1.4 million), and EU funded project GEOSMART focusing on geothermal extraction and purification of brine (~1.0m).

ASX Listing Rule 5.3.3: During the Quarter, the Kachelhoffa geothermal and Kachelhoffa mineral lithium exploration licences were granted; no licences were relinquished.

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 amounted to ~238,000. This is comprised of an allocation of the Managing Director remuneration of ~56,000, Executive Chair remuneration of ~102,000 and Non-Executive Director fees of ~80,000. Payments to related parties of the Company and their associates during the quarter per section 6.2 of Appendix 5B total ~45,000. 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 2023 Annual Report for further details on Directors' Remuneration.

Vulcan's integrated renewable energy and ZERO CARBON LITHIUM™ Project licence table

NAME	STATE	RESOURCES APPLIED FOR	AREA (KM ²)	EXPIRY	OWNERSHIP AS AT 30 JUNE 2023
Ried	Hessen	Geothermal, brine & lithium	289.92	7.2025	100 % VER GmbH
Luftbrücke	Hessen	Geothermal, brine & lithium	207.25	9.2026	100 % VER GmbH
Rift-Nord (or Rift)	RLP	Geothermal & lithium	61.83	6.2027	50% interest in licence, with 100% ownership of first new production project developed
Waldnerturn	BW	Geothermal, brine & lithium	20.43	12.2024	100 % VER GmbH
Lampertheim II	Hessen	Geothermal, brine & lithium	1.99	7.2026	100 % VER GmbH
Ortenau II	BW	Geothermal, brine & lithium	374.1	12.2025	100 % VER GmbH
Mannheim	BW	Geothermal, brine & lithium	144.49	6.2027	100 % VER Pty Ltd
Taro	RLP	Geothermal	32.68	8.2025	100% GGH (part of VER Group)
Lisbeth	RLP	Lithium		9.2024	100 % VER GmbH
Ludwig	RLP	Geothermal & lithium	96.34	12.2024	100 % VER GmbH

Therese	RLP	Geothermal & lithium	81.12	12.2024	100 % VER GmbH
Lampertheim	Hessen	Geothermal, brine & lithium	108.03	7.2026	100 % VER GmbH
Kerner	RLP	Geothermal & lithium	72.26	12.2024	100 % VER GmbH
Löwenherz	RLP	Geothermal & lithium	75.43	12.2024	100 % VER GmbH
Flaggenturm	RLP	Geothermal		12.2024	100 % VER GmbH
Fuchsmantel	RLP	Lithium	166.75	7.2025	100 % VER GmbH
Landau-Süd	RLP	Geothermal		19.41	5.2034 JV and brine offtake[1] agreement G
Ilka	RLP	Lithium			11.2025 JV and brine offtake[2] agreement G
Insheim	RLP	Geothermal		19	11.2037 100% Natürlich Insheim GmbH
LiThermEx	RLP	Lithium			3.2025 100% Natürlich Insheim GmbH
Kachelhoffa	FR	Geothermal			7.2029 100 % Vulcan Énergie France
Kachelhoffa minéral	FR	Lithium	463.34	7.2029	100 % Vulcan Énergie France
Cesano	ITA	Geothermal & Lithium	11.46	01.2025	100 % Vulcan Energy Italy Pty Ltd

Mineral resources and ore reserves

Vulcan's integrated renewable energy and ZERO CARBON LITHIUM™ Project Lithium (Li) brine Mineral Resource estimates, as well as Mineral Reserve estimates, did not change during the Quarter.

For and on behalf of the Board

Daniel Tydde | Company Secretary

Media

Australia:

Judith Buchan, Communications Lead APAC | jbuchan@v-er.eu | +61 411 597 326

International:

Annabel Roedhammer, Vice President Communications | aroedhammer@v-er.eu | +49 (0) 1511 410 1585

Please contact Vulcan's Legal Counsel Germany, Dr Meinhard Grodde, for matters relating to the Frankfurt Stock Exchange listing on mgrodde@v-er.eu.

About Vulcan

Founded in 2018, Vulcan's unique ZERO CARBON LITHIUM™[3] Project (the Project) aims to decarbonise lithium production, through developing the world's first carbon neutral lithium business, with the co-production of renewable geothermal energy on a mass scale. By adapting existing technologies to efficiently extract lithium from geothermal brine, Vulcan aims to deliver a local source of sustainable lithium for Europe, built around a carbon neutral strategy with exclusion of fossil fuels from the process to produce lithium. Already an operational renewable energy producer, Vulcan will also provide renewable electricity and heat to local communities. Vulcan's combined geothermal energy and lithium resource is estimated to be the largest in Europe on a lithium carbonate equivalent (LCE) basis[4], with licence areas focused on the Upper Rhine Valley, Germany and France. Strategically placed in the heart of the European electric vehicle market

to decarbonise the supply chain, Vulcan is rapidly advancing the ZERO CARBON LITHIUM™ Project to target timely market entry, with the ability to expand to meet the unprecedented demand that is building in the European markets. Guided by our Values of Climate Champion, Determined and Inspiring, and united by a passion for the environment and leveraging scientific solutions, Vulcan has a unique, world-leading scientific and commercial team in the fields of lithium chemicals and geothermal renewable energy. Vulcan is committed to partnering with organisations that share its decarbonisation ambitions and has binding lithium offtake agreements with some of the largest cathode, battery, and automakers in the world. Vulcan aims to leverage its multidisciplinary expert team, leading geothermal technology and position in the European EV supply chain to be a global leader in producing carbon neutral lithium. Vulcan aims to be the supplier of choice for premium lithium chemicals and renewable power and heating from Europe, for Europe; to empower a carbon neutral future.

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.

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Vulcan has carried out a definitive feasibility study ("DFS") and bridging engineering study ("Bridging Study") for Phase One of its Zero Carbon Lithium™ Project ("Project"), the results of which were announced to the ASX in the announcements "Zero Carbon Lithium Project Phase 1 DFS Results" dated 13 February 2023 ("DFS Announcement") and "Positive Zero Carbon Lithium™ Project Bridging Study Results" on 16 November 2023 ("Bridging Study Announcement"). This announcement may include certain information relating to the DFS and the Bridging Study. The DFS and Bridging Study are based on the material assumptions and parameters outlined in their respective announcements. While Vulcan considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Bridging Study or DFS will be achieved. This presentation may also include certain information relating to Phase 2 of its Project, Vulcan has not yet carried out a definitive feasibility study for Phase Two of its Project.

Competent Person Statement

The information in this announcement that relates to estimates of Mineral Resources and Ore Reserves is extracted from the Bridging Study Announcement which is available to view on Vulcan's website at www.v-er.eu. Vulcan confirms, that in respect of the estimates of Mineral Resources and Ore Reserves included in this announcement:

1. it is not aware of any new information or data that materially affects the information included in the original market announcement, and that all material assumptions and technical parameters underpinning the estimates in the original market announcement continue to apply and have not materially changed;
2. the form and context in which the Competent Persons' findings are presented in this announcement have not been materially modified from the original market announcement; and
3. all material assumptions underpinning the production targets (and the forecast financial information derived from such production targets) included in this announcement continue to apply and have not materially changed.

[1] Please see ASX announcement dated 27 September 2024 for further information relating to this licence

[2] Please see ASX announcement dated 27 September 2024 for further information relating to this licence

[3] Please see page 13 of the 2023 Sustainability Report for how we define ZERO CARBON LITHIUM™

[4] According to public, JORC-compliant data. See Appendix 4 of Vulcan's announcement "Managing Director's 2023 AGM Presentation" dated 29 May 2023 for comparison information.

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