

## Quarterly Activities Report for the period ending 31 December 2024

During the period ending 31 December 2024 (the Quarter), Vulcan Energy (Vulcan, ASX: VUL, FSE: VUL, the Company) achieved significant milestones to further progress its Phase One Lionheart Project (the Project), Europe's most advanced integrated renewable energy and sustainable lithium project.

### Highlights from the Quarter

- Successful completion of a fully underwritten institutional placement and concurrent strategic placement (Placement) raising €100m (A\$164m) and a subsequent Share Purchase Plan which raised ~€4.9m (~\$8m)<sup>1</sup>
- Conditional debt commitment letter for €879m (~A\$1.45bn) received from Export Finance Australia (EFA) and a group of seven commercial banks for the financing of Vulcan's Project
- EIB Board approved its participation in the Phase One debt financing process, with the financing potentially amounting to up to €500m (~A\$819m), pending completion of final due diligence, signing of legal documentation and final internal approval
- Planned evolution of the Company's Board of Directors and committees, effective 1 January 2025. Angus Barker, Non-Executive Director was appointed as Lead Independent Director and Deputy Chair and Felicity Gooding was appointed Executive Director, in addition to her role as Group Chief Financial Officer
- Partnership agreement signed with BASF, one of the world's largest chemical producers, to collaborate on the development of a renewable heat project to supply BASF with baseload heat from a future phase of production
- Awarding of €100m (A\$162m) from the German Federal Ministry of Economics and Climate Protection (BMWK) and the European Recovery and Resilience Facility via the German Recovery and Resilience Plan (the BEW Funding) for its HEAT4LANDAU Project
- Official opening and start of lithium hydroxide production at the Company's downstream Central Lithium Electrolysis Optimisation Plant (CLEOP) in Industrial Park Höchst, Frankfurt
- Signing of an option agreement with the City of Landau to secure the property for the upstream geothermal and lithium plant for Phase One
- Completion of the Company's Green Financing Framework and its awarding of Dark Green status by S&P Global Ratings, the highest ever received by a Metals and Mining company globally.

### Subsequent events

- Production of the first battery-quality Lithium Hydroxide Monohydrate (LHM) at the downstream optimisation plant, by processing high purity lithium chloride concentrate extracted from brine at the upstream A-DLE optimisation plant in Landau, Germany. This represents the first fully integrated, battery-quality LHM produced in Europe, from resource to final product

<sup>1</sup> The SPP closed on 20 January 2025, following the end of the Quarter. Converted at EUR 0.61/A\$1.00. A total of 29,386,249 Shares were issued pursuant to the placement and SPP.

- Both the Ludwigshafen City Council and Frankenthal City Council have unanimously approved the start of the seismic campaign for a future phase of development, in the joint development area (designated Ludwigsland) with BASF. These decisions were made on 13 January 2025 and 21 January 2025 respectively, marking the first major milestone in Vulcan and BASF's joint project. Measurements are scheduled to commence in Q1, 2025
- The Company's Share Purchase Plan (SPP), announced in December 2024, closed on 20 January 2025. Under the SPP, shareholders validly subscribed for an amount of ~€4.9m (~\$8m) worth of new fully paid ordinary shares in the Company at an offer price of A\$5.85 per SPP Share.

*Managing Director and CEO, Cris Moreno, commented: "Q4 2024 will be remembered as significant in the history of Vulcan. We achieved a number of critical milestones and continued the strong momentum Vulcan built over the course of 2024.*

*"In particular, the start of lithium hydroxide production at our downstream optimisation plant in November was a major step forward and, together with the official opening of the plant, was the culmination of many years' of work. During the Quarter, we also announced German government funding, strategic partnerships, and made substantial progress on the financing of Phase One of the Project.*

*"Following our successful capital raise in December, we expect the positive trajectory to continue throughout 2025, with project execution works set to commence for Phase One in Q1 2025, including the start of well execution. We look forward to keeping our shareholders abreast of these exciting developments."*

### **Health and safety**

- There were no Lost Time Injuries (LTI) during the reporting period.

### **Integrated renewable energy and lithium production**

#### **Renewable energy operations**

- Operations continued at Vulcan's Natürlich Insheim geothermal renewable energy plant with production of approximately 5,460MWh of gross baseload, renewable power, at an average selling price of €0.270/kWh, with €1,475 million gross revenue generated.

#### **Well site preparation and rig readiness**

- The Special Operation Plan for drilling and monitoring the first new wells at the Phase One Schleidberg site was approved by the mining authority during the reporting period. Preparatory work is ongoing, with the well pad and crew camp construction completed within the same period, as well as access roads to the Schleidberg well site which were constructed during the Quarter
- Mobilisation of Rig V20 to the Phase One Schleidberg site was approved in December and will commence early 2025. The refurbishment of the V10 rig is scheduled for completion in 2025.



*Figure 1 Aerial shot of the Phase One Schleidberg well site*

### **Lithium Extraction Optimisation Plant (LEOP)**

- High-quality 40% Lithium Chloride (LiCl) solution was produced using Adsorption-type Direct Lithium Extraction (A-DLE) with VULSORB®, Vulcan's internally developed aluminate-based sorbent, at the upstream optimisation plant LEOP, and transferred to the downstream CLEOP at Industrial Park Höchst for the production of lithium hydroxide monohydrate (LHM).

### **Central Lithium Electrolysis Optimisation Plant (CLEOP)**

- On 7 November 2024, the Company's downstream CLEOP, located in Industrial Park Höchst, Frankfurt, Germany, started production of lithium hydroxide
- The Company officially opened the plant on 8 November 2024, in a ceremony attended by several local, national and international guests from politics and industry, including Deputy Prime Minister of Hessen, Mr Kaweh Mansoori, and Australian Ambassador to Germany, Ms Natasha Smith, highlighting the significance of the occasion to Germany, greater Europe and Australia
- CLEOP is the Company's pre-commercial downstream optimisation plant. At CLEOP, LiCl solution produced from Vulcan's 100%-owned upstream operations is being converted to battery-quality LHM.



Figure 2 Vulcan's Co-Founder, Dr Horst Kreuter, Co-Founder and Executive Chair, Dr Francis Wedin, Mike Josef, Lord Mayor of Frankfurt, Vulcan's Managing Director and CEO, Cris Moreno, and Deputy Prime Minister of Hessen Kaweh Mansoori during the CLEOP opening on 8 November 2024.

### Phase One execution readiness

- Progress continued on Phase One execution readiness, including engineering works to support permitting as well as permitting activities for remaining Phase One areas
- EPCm validation phase was successfully completed during the Quarter, with only minor adjustments to specific estimates, confirming accuracy of the initial projections and timeline
- The Company and the City of Landau signed an option agreement on 26 November 2024 to secure the property in the D12 development plan in the City of Landau. The reservation of the area in the Am Messegelände Südost Industrial Park represents a step towards the implementation of the planned integrated geothermal and lithium plant. This plant intends to provide carbon neutral heat and sustainable lithium for the region, while also making an important contribution to the energy transition.

### Commercial and financing

#### €100m (A\$164m) Placement

- The Company successfully completed a fully underwritten Placement on 11 December 2024. The Placement raised €100m (A\$164m) from the issue of ~28 million new, fully paid ordinary shares (New Shares) at an offer price of A\$5.85 per New Share/ €3.75 per New Share. The Placement was strongly supported by existing and new institutional investors, including a number of local and global institutions. The New Shares issued under the Placement will rank equally with existing Vulcan shares from their issue date. In addition, the Company raised ~€4.9m (~\$8m) via a subsequent SPP which closed on 20 January 2025.

#### Progress on debt financing process

- During the reporting period, the Company announced the signing of a €879m (~A\$1.45bn) conditional debt commitment letter with EFA and a group of seven commercial banks for the financing of the

Project of approximately €1.5bn – €1.6bn, which included a credit pre-approved term sheet setting out the key terms and conditions of the proposed debt financing. Vulcan is seeking additional approvals from Export Development Canada (EDC), Bpifrance AE (Bpifrance) and SACE to participate in the Project financing, to reach a target total debt package of approximately €1.5bn – €1.6bn (Total Debt Requirement).

- The EIB Board approved its participation in the Company's Phase One debt financing process on 12 December 2024. Financing could potentially amount to up to €500m (~A\$819m), pending completion of final due diligence, signing of legal documentation and final internal approval. The EIB's involvement is expected to serve as a cornerstone to complement the ongoing Phase One funding process.

### **Awarding of €100m (A\$162m) from German Federal Ministry**

- The Company announced the awarding of €100m (A\$162m) from the German Federal Ministry of Economics and Climate Protection (BMWK) and the European Recovery and Resilience Facility via the German Recovery and Resilience Plan (the BEW Funding) for its HEAT4LANDAU Project.
- The BEW Funding is allocated under the Guideline for Federal Funding for Efficient Heating Networks (Bundesförderprogramm effiziente Wärmenetze – BEW) and will enable transformative measures for decarbonising district heating networks in Landau, Rheinland-Pfalz.

### **Board changes**

- As part of the evolution of the Company Board, Vulcan carried out planned changes to its Company Board and committees effective 1 January 2025. Felicity Gooding was appointed as Executive Director, in addition to her role as Group Chief Financial Officer. A senior finance executive with 20 years' experience and extensive listed company director experience, Ms Gooding joined the Company in January 2024, responsible for the Company's corporate services, including steering the Phase One debt and project-level equity financing
- Non-Executive Director, Angus Barker, was also appointed as Lead Independent Director and Deputy Chair. Mr Barker, an experienced director with a strong background in corporate finance and public company boards, joined the Board as Non-Executive Director in September 2024.

### **Strategic partnerships**

#### **Agreement signed with BASF SE (BASF)**

- Vulcan announced it would be entering into a staged agreement with one of the world's largest chemical producers, BASF SE (BASF), to collaborate on the development of a renewable heat project to supply BASF with baseload heat
- The agreement also incorporates the potential construction of a commercial Lithium Extraction Plant in Ludwigshafen, BASF's global headquarters and home to the largest integrated chemical complex globally.





Figure 3 Vulcan and BASF sign agreement in the presence of local politicians and utility representatives

### Memorandum of Understanding signed with AVEVA

- Vulcan and AVEVA, a global leader in industrial software, signed a Memorandum of Understanding (MoU) on 15 October 2024 to establish a digital backbone for the Project. The partnership highlights both companies' commitment to sustainability and digital transformation across industrial asset lifecycles, with Vulcan to leverage AVEVA's expertise to future-proof its information systems architecture, facilitating seamless project execution, engineering integration, and operational excellence.



Figure 4: Vulcan Managing Director and CEO, Cris Moreno, and CEO of AVEVA, Caspar Herzberg

### Environmental, Social and Governance (ESG)

#### S&P Global Dark Green rating

- The Company's Green Financing Framework was assessed by independent ratings agency, S&P Global Ratings, and awarded a Dark Green rating across the Green Enabling Project and Renewable

Energy categories, and Dark Green overall. It is the highest such rating ever received by a Metals and Mining company globally

- An S&P Global Second Party Opinion (SPO) assesses whether the Framework aligns with third-party published sustainable finance principles, including the International Capital Market Association (ICMA) Green Bond Principles and Green Enabling Projects Guidance, and the Loan Market Association (LMA) Green Loan Principles.

#### **Site visits from political representatives**

- Throughout the reporting period, several regional political leaders, strategic partners, and stakeholders were briefed on the Project's progress during site visits. Notable visitors included Thüga Energienetze, the municipal utilities of Frankenthal, representatives of the Metropolregion Rhein-Neckar, and Dr Thomas Gaeckle, Head of the Competition Policy and Public Procurement Law Division at the Federal Ministry of Economic Affairs and Climate Protection.

#### **Additional ASX Disclosure Information**

ASX Listing Rule 5.3.1: Exploration and Evaluation expenditure during the Quarter was €1.8 million. Expenditure related to planning for the upcoming project execution and interpretation costs. Interpretation costs include capitalised costs from 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 €12.0 million. Expenditure predominately related to drill casings equipment (€5.2m), Schleidberg wellsite preparation (€0.6m), refurbishment costs for Vulcan's two electric drill rigs (€1.6 million), construction of the Central Lithium Electrolysis Optimisation Plant (€1.6 million), and other expenditure (€3.0m) including the interconnected pipeline and power (ICPP) and Lithium Extraction Plant (LEP).

ASX Listing Rule 5.3.3: During the Quarter, no licences were acquired, nor disposed of. For further information see Table 1 below.

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 €281,000. This is comprised of an allocation of the Managing Director remuneration of €58,000, Executive Chair remuneration of €102,000 and Non-Executive Director fees of €120,000. Payments to related parties of the Company and their associates during the quarter per section 6.2 of Appendix 5B total €48,000. This amount is an allocation of the Managing Director's remuneration for work done on exploration activities associated with Vulcan's Phase One Lionheart Project. Please see the Remuneration Report in the 2023 Annual Report for further details on Directors' Remuneration.

## Vulcan's integrated lithium and renewable energy project licence table

| NAME                       | STATE  | RESOURCES APPLIED FOR       | AREA (KM <sup>2</sup> )                         | EXPIRY  | OWNERSHIP AS AT 30 JUNE 2024  | CHANGE IN OWNERSHIP | TYPE        |
|----------------------------|--------|-----------------------------|---|---------|---|---------------------|-------------|
| <b>Ried</b>                | Hessen | Geothermal, brine & lithium | 289.92  | 7.2025  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Luftbrücke</b>          | Hessen | Geothermal, brine & lithium | 207.25  | 9.2026  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Rift-Nord</b>           | RLP    | Geothermal & lithium        | 61,83 (VER share), 149.74 km <sup>2</sup> total | 6.2027  | 50 % VER GmbH, 50 % GET, Vulcan has rights to develop production projects with 100% ownership in the licence area | N/A                 | exploration |
| <b>Waldnerturm</b>         | BW     | Geothermal, brine & lithium | 20.43   | 12.2026 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Lampertheim II</b>      | Hessen | Geothermal, brine & lithium | 1.99  | 7.2026  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Ortenau II</b>          | BW     | Geothermal, brine & lithium | 374.1   | 12.2025 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Mannheim</b>            | BW     | Geothermal, brine & lithium | 144.49  | 6.2027  | 100 % VER Pty Ltd   | N/A                 | exploration |
| <b>Taro</b>                | RLP    | Geothermal                  | 32.68   | 8.2025  | 100% GGH (part of VER Group)  | N/A                 | exploration |
| <b>Lisbeth</b>             | RLP    | Lithium                     |   | 9.2027  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Ludwig</b>              | RLP    | Geothermal & lithium        | 96.34   | 12.2027 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Therese</b>             | RLP    | Geothermal & lithium        | 81.12   | 12.2027 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Lampertheim</b>         | Hessen | Geothermal, brine & lithium | 108.03  | 7.2026  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Kerner</b>              | RLP    | Geothermal & lithium        | 72.26   | 12.2027 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Löwenherz</b>           | RLP    | Geothermal & lithium        | 75.43   | 12.2026 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Flaggenturm 2023</b>    | RLP    | Geothermal                  | 166.75  | 12.2027 | 100 % VER GmbH  | N/A                 | exploration |
| <b>Fuchsmantel 2023</b>    | RLP    | Lithium                     |   | 7.2025  | 100 % VER GmbH  | N/A                 | exploration |
| <b>Landau-Süd</b>          | RLP    | Geothermal                  | 19.41   | 5.2034  | Agreement signed by Vulcan to acquire 100%  | N/A                 | production  |
| <b>Ilka</b>                | RLP    | Lithium                     |   | 11.2025 | Agreement signed by Vulcan to acquire 100%  | N/A                 | exploration |
| <b>Insheim</b>             | RLP    | Geothermal                  | 19  | 11.2037 | 100 % Natürlich Insheim GmbH  | N/A                 | production  |
| <b>LiThermEx</b>           | RLP    | Lithium                     |   | 3.2025  | 100% Natürlich Insheim GmbH   | N/A                 | exploration |
| <b>Kachelhoffa</b>         | FR     | Geothermal                  | 463.34  | 7.2029  | 100% Vulcan Énergie France  | N/A                 | exploration |
| <b>Kachelhoffa minéral</b> | FR     | Lithium                     |   | 7.2029  | 100 % Vulcan Énergie France   | N/A                 | exploration |
| <b>Cesano</b>              | IT     | Geothermal & Lithium        | 11.46   | 01.2027 | 50% Vulcan Energy Italy Pty Ltd., 50 % Enel Green Power   | N/A                 | exploration |
| <b>Boccaleone</b>          | IT     | Geothermal & Lithium        | 4.31  | 07.2025 | 50 % Vulcan Energy Italy Pty Ltd., 50 % Enel Green Power  | N/A                 | exploration |

Table 1: Vulcan's licences as at the date of this report, with the licences of Phase One shaded in grey.



## Mineral resources and ore reserves

Vulcan's Phase One Lionheart Project lithium (Li) brine Mineral Resource estimates, as well as Mineral Reserve estimates, did not change during the Quarter.

## Disclaimer Bundesregierung



HEAT4LANDAU Project: Funded by the European Union - NextGenerationEU. The expressed views and opinions expressed are solely those of the author(s) and do not necessarily reflect the views of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

## For and on behalf of the Board

Daniel Tydde | Company Secretary

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## About Vulcan Energy

Vulcan Energy (ASX: VUL, FSE: VUL) is building the world's first carbon neutral, integrated lithium and renewable energy business to decarbonise battery production. Vulcan's Lionheart Project, located in the Upper Rhine Valley Brine Field bordering Germany and France, is the largest lithium resource in Europe<sup>2</sup> and a tier-one lithium project globally. Harnessing natural heat to produce lithium from sub-surface brines and to power conversion to battery grade material and using its in-house industry-leading technology VULSORB®, Vulcan is building a local, low-cost source of sustainable lithium for European electric vehicle batteries. For more information, please go to <https://v-er.eu/>

## 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

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<sup>2</sup> On a lithium carbonate equivalent (LCE) basis, according to public information, as estimated and reported in accordance with the JORC Code 2012. See Appendix 4 of Vulcan's Equity Raise Presentation dated 11 December 2024 for comparison information.

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 its Phase One Project, the results of which were announced to the ASX in the announcements Phase 1 DFS Results dated 13 February 2023 (DFS Announcement) and 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 of 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 announcement may also include certain information relating to Phase Two 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 <http://v-er.eu> Vulcan confirms, that in respect of the estimates of Mineral Resources and Ore Reserves included in this announcement:

- a) 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;
- b) 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
- c) 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.