



VULCAN ENERGY
ZERO CARBON LITHIUM™



INTERIM MANAGEMENT REPORT

1 January – 30 June

24

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1. ABOUT THE VULCAN GROUP

BUSINESS MODEL AND CORPORATE PROFILE

Vulcan Energy Resources Limited (the Company) is dual listed on the Australian Securities Exchange (ASX), and the regulated market of the Frankfurt Stock Exchange (FSE), in the Prime Standard market segment.

Founded in 2018, Vulcan's unique ZERO CARBON LITHIUM™¹ 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 the largest in Europe², 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.

Consistent with the regulatory and reporting obligations of the FSE, Vulcan's June 2024 Half Year Reporting Suite also includes the June 2024 Interim Management Report (Konzernlagebericht). The Konzernlagebericht has been prepared in accordance with the Deutscher Rechnungslegungsstandard Nr. 16 (DRS 16). Vulcan's Reporting Suite is available on the Company's website: www.v-er.eu

¹ Please see the subsequent page for how we define ZERO CARBON LITHIUM™

² According to public, JORC-compliant data. See Upgrade of Zero Carbon Lithium™ Project Resources, 29 September 2023

DEFINING ZERO CARBON LITHIUM™

Vulcan Energy uses zero carbon in its trademark to refer to the climate change impact of the lithium hydroxide monohydrate (LHM) product extraction and processing. Vulcan is currently targeting zero burning of fossil fuels in the process to produce LHM once fully operational.

Since 2020, Vulcan has commissioned Minviro to undertake a series of International Organisation for Standardisation (ISO) compliant Life Cycle Assessments (LCAs). These are cradle-to-gate studies which include the extraction of the raw lithium product, the geothermal plant, the brine handling, the purification, electrolysis and crystallisation, and the transport of the product from well sites through to the final processing plant. The LCA does not include emissions associated with construction of the ZERO CARBON LITHIUM™ production plant, or the Vulcan Group's corporate office emissions.

The latest update of the LCA, undertaken in 2024, found that Vulcan's integrated renewable energy and ZERO CARBON LITHIUM™ Project has an overall net climate change impact contribution of $-2.0 \text{ kg CO}_2 \text{ eq. per kg LiOH.H}_2\text{O}$. This included the estimated emissions from lithium production and transport including import of energy from the grid, and estimated emissions avoided due to export of geothermal electricity and heat into the grid and district heating respectively (note: these figures relate to scopes one, two and upstream three emissions only).

The Company is committed to continuing to update the LCA and any associated messaging as the Project moves into execution and construction.

2. KEY EVENTS

Half Year 2024 milestones and developments

- **Strategic investments³:** Investments totaling €40 million received from strategic investors including CIMIC Group (CIMIC) and Hancock Prospecting Pty Ltd (HPPL), demonstrating strong support of the lithium value chain globally and for the execution of Phase One of the Project.
- **First lithium chemicals domestically produced from a local source in Europe, for Europe⁴:** Start of production (SOP) of Lithium Chloride from its Lithium Extraction Optimisation Plant (LEOP) on 11 April 2024. The SOP followed over three years and more than 10,000 hours of successful in-house A-DLE piloting by Vulcan.
- **Positive support from Landau City Council:** The Council voted with a majority in favour of the land development plan for the industrial estate containing Vulcan's Phase One Geothermal Lithium Extraction Plant (G-LEP) location.
- **Launch of final stage of project-level financing⁵:** Finance process progressing having received significant interest from strategic financial investors and commercial banks.
- **Proposed financing from the European Investment Bank (EIB)⁶:** After preliminary due diligence, Phase One of the Project advanced to the "Under Appraisal" stage of EIB financing. EIB's proposed financing could amount to up to €500m, pending completion of due diligence, credit approval and legal agreement, and is subject to EIB's governing bodies approval.
- **Signing of Memoranda of Understanding (MoUs) with ABB and JordProxa:** The MoU with ABB focusses on the electrical and automation delivery requirements of Vulcan's Phase One Project, while the JordProxa MoU is for the technology and process components for the lithium extraction plant and central lithium plant of Vulcan's Phase One Project.
- **Sector leading sustainability credentials:** Vulcan's 2024 Prospective Life Cycle Assessment was updated during the reporting period based on outcomes of the Bridging Engineering Study, reinforcing the sustainability credentials of the Project. A calculation was also carried out for the EU Innovation Fund application process, resulting in a forecast of 4.1 million tonnes of avoided CO₂ equivalent emissions within the first ten years of Phase One of the Project.
- **Appointment of Group Chief Financial Officer⁷:** Ms Felicity Gooding was appointed to the role of Group Chief Financial Officer (CFO) for the Vulcan Group. Ms Gooding has significant large scale project financing and multinational experience and has joined Vulcan at an opportune time with Vulcan's Phase One debt and project level equity finance program underway.

³ <https://www.investi.com.au/api/announcements/vul/d892790b-6a8.pdf>

⁴ <https://www.investi.com.au/api/announcements/vul/16999da3-dff.pdf>

⁵ <https://www.investi.com.au/api/announcements/vul/a4c48d6a-e47.pdf>

⁶ <https://www.investi.com.au/api/announcements/vul/5cc4906e-c89.pdf>

⁷ <https://www.investi.com.au/api/announcements/vul/736d3b83-d1.pdf>

3. EARNINGS PERFORMANCE, ASSETS AND FINANCIAL POSITION

EARNINGS PERFORMANCE

CONSOLIDATED STATEMENT OF PROFIT AND LOSS FOR THE SIX MONTHS ENDED 30 JUNE 2024 AND 2023

	30 June 2024 € '000	30 June 2023 € '000
Revenue from continuing operations	3,753	3,104
Other income	297	461
Share of loss from equity accounts investments	(50)	(465)
Other own work capitalised	9,347	7,487
Raw materials and purchased services	(555)	(1,627)
Employee benefit expenses	(19,748)	(12,933)
Depreciation and amortisation	(3,336)	(2,942)
Impairment expenses	-	(1,040)
Share-based payments expense	(1,151)	(905)
Other expenses	(9,071)	(9,349)
Net foreign exchange gain	450	772
Finance income	1,005	1,560
Finance Expense	(89)	(118)
Loss before income tax expense	(19,148)	(15,995)
Income tax (expense)/ benefit	(198)	411
Loss after income tax for the period	(19,346)	(15,584)
EBITDA	(16,728)	(13,455)

Revenue from continuing operations

During the six month period to June 2024, the Group had revenue from the Insheim geothermal power plant of €2.2 million (June 2023: €2.0 million). Insheim revenue was lower in the current six month period than in the corresponding period, principally due to a maintenance shutdown. During the six month period the Group had revenue of €1.0 million from its drilling labour hire company, Comeback Personaldienstleistungen GmbH (Comeback) and €0.5 million from its drill rig refurbishment company, Vercana GmbH (Vercana).

Other own work capitalised

Time spent by engineers from Vulcan Energy Engineering (VEE) and Vulcan Energy Subsurface Engineering (VES) on Vulcan's projects has been capitalised to exploration and evaluation or plant and equipment on the balance sheet, if time was incurred on the design and construction of LEOP and Central Lithium Electrolysis Optimisation Plant (CLEOP). These costs, plus staff in Vercana who have worked in refurbishing Vulcan's two electric drill rigs, as well as project-related staff in Vulcan Energie Ressourcen GmbH, are reflected as other own work capitalised in the Consolidated Statement of Profit and Loss for the six month period totalling €9.3 million (June 2023: €7.5 million). This increase reflects the increasing intensity of works focus on the ZERO CARBON LITHIUM™ Project.

Expenses

Operating costs, including the purchase of raw materials for the Insheim plant, as well as purchased services, amounted to €0.6 million for the six month period to June 2024 (June 2023: €1.6 million). The large decrease in raw materials and purchased services from prior year was due to a planned shut-down of the Insheim power plant in May and June 2024. Depreciation cost of plant and equipment amounted to €3.3 million (June 2023: €2.9 million).

Employee costs increased from €12.9 million in the six month period to June 2023 to €19.7 million during the six month period to June 2024 reflecting the increase in full time equivalent employees from 316 at June 2023 to 363 at June 2024.

Non-cash share-based payments relating to long term incentives amounted to €1.2 million for the six month period to June 2024 (June 2023: €0.9 million).

Other expenses of €9.1 million for the six months ended 30 June 2024 were consistent with the prior period of €9.3 million.

Loss before income tax

The net loss after tax for the six month period to June 2024 was €19.3 million (June 2023: €15.6 million). The net loss to 30 June 2023 included a one-off impairment cost of €1.0 million for goodwill associated with the acquisition of the Gec-co business (now "VEE") in 2021, which is predominately focused on engineering for Vulcan's projects rather than external clients.

Movement in the Australian Dollar exchange rate compared to the Euro resulted in a foreign currency gain of €0.4 million in the Consolidated Statement of Profit and Loss or Other Comprehensive Income of the Group, compared to €0.8 million for the six month period ended

30 June 2023. The resulting gain predominately related to a revaluation of cash held in Australian dollars in the parent entity.

EBITDA

EBITDA was a loss of €16.7 million for the six month period to June 2024 (30 June 2023: a loss of €13.5 million). The increase in the EBITDA loss was reflective of the increased activity in development of the Company's integrated renewable energy and ZERO CARBON LITHIUM™ Project including the addition of technical and administrative staff.

The EBITDA loss for the six month period to 30 June 2024 for Germany was €13.0 million and Australia €3.7 million.

ASSET AND FINANCIAL POSITION

Statement of Cash Flows

SUMMARY CONSOLIDATED STATEMENT OF CASH FLOWS⁸

	30 June 2024	30 June 2023
	€000's	€000's
Net cash used in operating activities	(12,513)	(12,991)
Net cash used in investing activities	(43,607)	(36,281)
Net cash provided by financing activities	37,824	63,975
Net (decrease) / increase in cash and cash equivalents	(18,296)	14,703
Cash and cash equivalents at beginning of the period	78,728	134,107
Effect of exchange rate fluctuations	145	(1,168)
Cash and cash equivalents at end of the period	60,577	147,642

Net cash provided by operating activities

The net operating cash outflow from continuing operations for the six month period to 30 June 2024 of €12.5 million was in line with net cash outflow of €13.0 million for the 6 months ended 30 June 2023.

Net cash provided by investing activities

Investing activities led to a cash outflow of €43.6 million in the first half of 2024 (30 June 2023: net cash outflow €36.3 million). Significant cash outflows for the six month period include:

- Well site preparation and rig readiness.
- Engineering and construction of the LEOP and CLEOP plants.
- Engineering of the Phase One Lithium Extraction Plant (LEP) and Central Lithium Plant (CLP).

Prior year expenditures included refurbishment of the electric drill rigs, engineering and construction of the LEOP and CLEOP, engineering of the Phase One LEP and CLP, exploration activities including work on the Company's Definitive Feasibility Study and land acquisition relating to the Project.

Net cash provided by financing activities

During the period, there was a net cash inflow of €37.8 million (30 June 2023: €64.0 million cash inflow), due largely to a strategic capital raise of €40.0 million (before costs) in June 2024.

⁸ Cash inflows/(outflows) by activity within the Consolidated Statement of Cash flows differ from the cash inflows/(outflows) by activity reported in the Group's Appendix 5B Quarterly Cashflow Report released to ASX on 29 July 2024.

Asset and Capital Structure

CONSOLIDATED SUMMARY STATEMENT OF FINANCIAL POSITION

	30 June 2024 €000's	30 Dec 2023 €000's
Current assets	68,128	86,071
Non-Current Assets	242,448	210,812
Total Assets	310,576	296,883
Equity	288,342	268,281
Current liabilities	14,843	20,785
Non- Current Liabilities	7,391	7,817
Total Liabilities	22,234	28,602
Total Equity and Liabilities	310,576	296,883

Current assets decreased by €18.0 million to €68.1 million as at 30 June 2024 (December 2023: €86.1 million) primarily due to a decrease in cash and cash equivalents due to spend incurred on capital and operating expenses offset by the strategic capital raise.

Non-current assets increased to €242.4 million (December 2023: €210.8 million). The increase was principally due to property plant and equipment additions of €26.4 million, largely relating to rig readiness and construction costs towards completion of the LEOP and CLEOP plants and €3.8 million capitalised exploration and evaluation attributable to progression of exploration activities.

Current liabilities decreased to €14.8 million (December 2023: €20.8 million) primarily due to a decrease in trade and other payables.

Non-current liabilities reduced to €7.4 million (December 2023: €7.8 million). Non-current liabilities primarily relate to lease liabilities relating to occupancy and vehicle leases as well as deferred income relating to government grants to support the Group in testing, development and optimisation of geothermal energy. The slight reduction from December 2023 was due to repayments made relating to lease liabilities.

Equity rose by €20.1 million during the period reflecting a strategic investor placement of €40.0 million before costs, partially offset by the loss for the period.

4. OUTLOOK, OPPORTUNITIES AND RISKS

OUTLOOK

ECONOMIC OUTLOOK

LITHIUM

The lithium market has continued to experience significant price volatility, with the market moving into a more sustained downward trend over recent periods. Negative macro sentiment, particularly commentary focused on the near-term supply thematic, has weighed down pricing and sentiment for all lithium pricing indices. However, lithium, a critical component in modern batteries, is essential for various industries, particularly electric vehicles (EVs). The lithium market is expected to see a surge in demand, projecting over 2.4 million metric tonnes of lithium carbonate equivalent by 2030⁹. Despite recent price volatility, driven by supply and demand dynamics and geopolitical factors, the long-term outlook for lithium is expected to be robust. Future lithium demand is anticipated to increase, driven by EV battery demand, with a potential reach of 3.8 million tonnes by 2035¹⁰.

Projected demand in EV sales is complemented by Europe's recent policies, including the Critical Raw Materials Act (CRMA), which focuses on securing domestic and sustainable lithium to supply the European market. In addition, the announcement in May 2024 for the start of the Battery Passport, effective from 1 July 2027, stating all industrial batteries over 2 kWh sold into the EU market will require a unique battery passport QR code¹¹ which is expected to further strengthen Europe's competitiveness in battery manufacturing and accelerate green transition in domestic sustainable critical raw battery materials.

GEOTHERMAL RENEWABLE ENERGY

Vulcan expects political and community support for developing geothermal heat and power to increase over the coming years. This is due to Europe and Germany's dual goals of climate change mitigation and regaining energy sovereignty. In June of this year, the 'Geothermal Acceleration Law'¹² was announced aiming to benefit geothermal operators, federal states, and local authorities, simplifying lengthy approval processes, all in support of Germany's goal to generate 10 TWh of geothermal energy by 2030. This legislation was passed by the federal cabinet in September 2024 and is anticipated to go to the federal parliament by the end of year to be passed.

⁹ <https://source.benchmarkminerals.com/article/analysis-lithium-industry-needs-42-billion-to-meet-2030-demand>

¹⁰ <https://www.statista.com/statistics/452025/projected-total-demand-for-lithium-globally/>

¹¹ https://circulareconomy.europa.eu/platform/sites/default/files/2024-03/1qp5xiZ-CEPS-InDepthAnalysis-2024-05_Implementing-the-EU-digital-battery-passport.pdf

¹² <https://www.bmwk.de/Redaktion/DE/Downloads/Gesetz/20240226-referentenentwurf-cms.html>

POLICY OUTLOOK

During the six month period, there were European policy decisions and new legislation enacted to support Europe's critical raw materials and green energy transition for the future. Vulcan is well placed as an integrated renewable energy and ZERO CARBON LITHIUM™ business to benefit from the legalisation for its Phase One operations and subsequent Phases. These include:

- European Critical Raw Materials Act¹³ (CRMA);
- Draft Geothermal Acceleration Law¹⁴ which is predicted to come into force by the end of 2024; and
- The Net-Zero Industry Act¹⁶

CORPORATE OUTLOOK

OPERATIONS

LEOP

During the six month period, significant advancements were made onsite at Vulcan's LEOP, which started production of LiCl on 11 April 2024. There have been consistent results with 90%-95% lithium extraction efficiency from its Adsorption-type Direct Lithium Extraction (A-DLE) unit, replicating results in the Company's lab and pilot plant operations, and in line with commercial plant expectations and Vulcan's financing model.

During Q4 of 2024, the LiCl produced at LEOP will be transported to Vulcan's downstream optimisation plant (CLEOP) in Industrial Park Frankfurt-Höchst, where the LiCl will be converted into battery-grade Lithium Hydroxide Monohydrate (LHM). In addition operations and continuous optimisation will continue in 2024.

CLEOP

Construction of CLEOP continued throughout the six month period with the main structural frame erected and installation of all equipment including an electrolyser and two crystallisers. The Company celebrated the Topping-Out ceremony (Richtfest) on 9 April 2024 in an event attended by local stakeholders and partners.

Commissioning phase of CLEOP commenced in August. Production of Vulcan's CLEOP is predicted to start in Q4 of 2024. Battery-grade LHM produced by CLEOP will be tested as part of the product qualification by Vulcan's lithium offtake partners, including Stellantis, Renault, Umicore, LG Energy Solution and Volkswagen. The site will also be used to train the production

¹³ https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1661

¹⁴ [https://www.reuters.com/business/energy/germany-expedite-approval-processes-geothermal-plants-2024-06-28/#:~:text=BERLIN%2C%20June%2028%20\(Reuters\),its%20heating%20system%20by%202045](https://www.reuters.com/business/energy/germany-expedite-approval-processes-geothermal-plants-2024-06-28/#:~:text=BERLIN%2C%20June%2028%20(Reuters),its%20heating%20system%20by%202045)

¹⁵ https://www.bmwk.de/Redaktion/DE/Downloads/Gesetz/20240628-entwurf-beschleunigung-genehmigungsverfahren-geowg.pdf?__blob=publicationFile&v=6

¹⁶ https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2309

team and optimise operating conditions as the commercial Phase One CLP will be constructed in the same Industrial Park.

Phase One financing

During the reporting period, Vulcan completed the first phase of its project-level financing process, and launched the second and final phase, led by BNP Paribas. The Company has received significant interest from commercial banks, the European Investment Bank (EIB) and major government backed export credit agencies and has entered into formal discussions with Tier 1 financing partners who have expressed in-principle and non-binding interest.

In parallel with the project-level debt process, Vulcan has also launched the final phase of its project-level equity financing process. Vulcan has received significant interest from strategic and financial investors after an initial due diligence phase, including from infrastructure and energy companies with whom Vulcan is expecting to build long term strategic partnerships. Vulcan intends to progress its financing process throughout 2024.

In addition to the ongoing formal financing discussions, the Company has also applied for a number of public funding programs, which, if successful, could see Vulcan benefit from a significant amount of public funding in the form of grants. The Company expects to begin receiving decisions regarding its various applications during Q4 2024.

Future phase development

As part of the development of Vulcan's project pipeline for expansion, the interpretation of the 3D seismic in the Mannheim area was successfully completed, and geological models have been developed.

Preparatory works for additional exploration campaigns within Vulcan's licence portfolio have begun. These exploration activities include three Full Tensor Gravimetry Gradiometry surveys in different licensed areas of the Upper Rhine Valley. One survey is in close cooperation with the Hessian Ministry of Economics and Energy, a 2D seismic survey in the licences of Ludwig, Therese, and Flagenturm/ Fuchsmantel, as well as various hydro chemical sampling campaigns. These datasets will be compiled in first geological-geothermal models as basis for the identification of sweet spots and for the design and parameter selection of a future 3D seismic survey to complement exploration in these licence areas.

Cash Position

With a cash position of €60.6 million as at 30 June 2024, the Company has a sound funding basis to start production at CLEOP and other preparatory works for Project execution in advance of project financing. Vulcan has launched the final stage of its project financing.

Capital Expenditure

For the remainder of 2024, Vulcan plans to focus capital expenditure on its Optimisation Plants and other preparatory works for Project execution.

Operating Expenditure

Operational expenditure is expected to remain largely stable in H2 2024 with a slight increase driven by full ramp-up of the optimisation plants.

Building a world-class team

After strong recruitment activity in 2022 and 2023, Vulcan has achieved a stable pre-execution work force of around 363 FTE as at 30 June 2024 and plans for a moderate increase to support operationalisation of its optimisation plants. A further increase in headcount will come once project financing for Phase One of its integrated renewable energy and ZERO CARBON LITHIUM™ Project is achieved and project execution commences.

OPPORTUNITIES AND RISKS

Vulcan is exposed to a range of internal and external events and developments that could impact the achievement of its financial and non-financial goals. Vulcan's opportunity and risk management process forms an integral part of the corporate governance system. This opportunity and risk management process, and the underlying opportunity and risk status is detailed in the Annual Group Management Report as at 31 December 2023¹⁷ Outlook, Opportunities and Risk Report.

Since the Annual Group Management Report as at 31 December 2023, there has been an increasingly challenging global lithium market, with more recent lithium pricing weaknesses, driven primarily by short-term imbalances in supply and demand. The Company notes its relative insulation to short-to-medium term lithium pricing fluctuations, with LHM production contracted to Tier 1 offtake partners over the first ten years, under various fixed, floor-ceiling and fully floating price contracts.

Responsibility statement by the Company's legal representatives

To the best of our knowledge, and in accordance with the applicable reporting principles, the interim consolidated financial statements give a true and fair view of the net assets, liabilities, financial position and results of the group, and the interim consolidated group management report includes a fair review of the development and performance of the business and the position of the group, together with a description of the principal opportunities and risks associated with the expected development of the group for the remainder of the financial year.



Dr Francis Wedin
Executive Chair
12 September 2024

¹⁷ <https://www.investi.com.au/api/announcements/vul/705a8935-6fb.pdf>