VULCAN ENERGY
ZERO CARBON LITHIUM™

ASX Release 18 March 2022

ASX:VUL
FSE:VUL

Fast Facts

Issued Capital: 131,607,598
Market Cap (@$9.57): $1.26b

Zero Carbon Lithium™ Project update

Vulcan Energy Resources Limited (Vulcan; ASX: VUL, FSE: VUL, the Company) is aiming to become the world's first integrated lithium chemicals and renewable energy producer with net zero greenhouse gas emissions. Vulcan's unique Zero Carbon Lithium™ Project aims to produce both renewable geothermal energy and lithium hydroxide for electric vehicle batteries from the same deep brine source in the Upper Rhine Valley, Germany.

Highlights

- **Lithium division:** pre-fabrication of Vulcan's Direct Lithium Extraction (DLE) - Demonstration Plant (Demo Plant) has commenced offsite in Germany, while 80% of the equipment has been ordered and design-work has been finalised. Start of commissioning of the Demo Plant is on track for mid-year.
- A team of experts from Nobian, Vulcan and external engineering teams are adapting Vulcan's lithium hydroxide production Demo Plant design to Nobian's existing site at the Höchst Chemical Park ahead of construction and operation.
- Vulcan's operational DLE Pilot Plant 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 operating since April 2021.
- New laboratory in Karlsruhe-Durlach, Germany, extending the analytical capability and expertise of the Company's lithium division, is now fully operational, with further expansions planned.
- **Renewable energy division:** the Company has commenced discussions with local stakeholders to expand operations at its 100% owned geothermal renewable energy plant, which is currently operating in Insheim, to provide heating and energy security to local communities.
- Refurbishment of the electric drill rigs purchased in 2021 is underway, with the rigs due to be operation-ready by the end of the year, before being deployed for mass-scale geothermal renewable energy development in Germany, reducing reliance on Russian gas.
- **Feasibility & financing:** kick-off of Bankability Study with BNP Paribas completed, in advance of planned financing process which will follow the DFS completion.
- Led by Vulcan's in-house team and supported by Hatch Ltd, the Definitive Feasibility Study (DFS) is progressing on track to be finalised in the second half of 2022.

Vulcan's Managing Director Dr. Francis Wedin commented: *"Vulcan is combining the fields of geothermal renewable energy and lithium battery materials, to create the world's first fully integrated renewable energy and battery raw materials company. Geothermal renewable energy on a mass scale, combined with lithium extraction from the same deep geothermal source, can and will play an important part in achieving Europe and Germany's energy security and independence. Geothermal energy in Germany has the potential to account for 50% of heat supply in Germany if backed up by sufficient investment. Vulcan's geothermal and lithium divisions are leaders in their field and are working hard to continue to realise significant project milestones in the development of Vulcan's Zero Carbon Lithium™ Project. It is encouraging to see the consistent and successful track record of our lithium Pilot Plant as it comes up to one year of operation, and positive to see the Demo Plant start to take shape. At a time when Europe, particularly Germany's, reliance on Russian energy is being keenly felt, we stand committed to helping ensure Europe's and Germany's energy independence and security of supply of sustainably sourced battery metals."*

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Zero Carbon Lithium™ division

Demo Plant

Building on the success of the Pilot Plant, Vulcan's Demo Plant is progressing well. The Demo Plant will consist of two parts: the DLE plant and the lithium hydroxide production plant. Importantly, technical and operations personnel will train in the plant to develop a comprehensive understanding of the process and its operation prior to construction of the first commercial plant, planned for 2024.

DLE Demo Plant

The DLE Demo Plant is a priority for the lithium team and will be installed and operated at an existing geothermal plant. A team of around 15 engineers and technicians have now finalised the design work and the pre-fabrication of the plant started in February 2022, offsite in Germany. Designed to produce 15 to 20 kg/h of concentrated LiCl solution from 5000 to 6000 l/h of geothermal brine, the Demo Plant will provide important operational learnings prior to Vulcan's planned start of commercial production in 2024. More than 80%of the equipment has been ordered and commissioning start is on track for mid-2022. The DLE Demo Plant will represent an approximately 1:200 scale of the first commercial plant. Once operational, the plant will employ more than 20 people, with the Company committed to prioritising local jobs in the Upper Rhine Valley region.

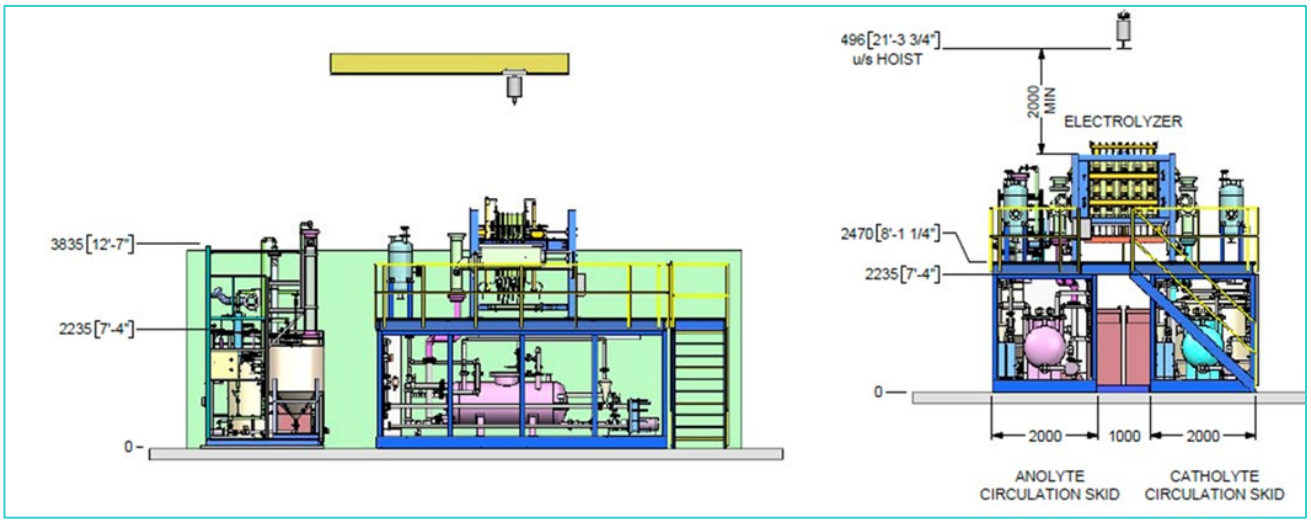
Below: Vulcan's DLE Demo Plant under construction, and a 3D image of the Demo Plant design.

Lithium hydroxide production – Demo Plant

The lithium hydroxide production Demo Plant, also known as "LiLy", will receive lithium chloride solution from the DLE Demo Plant and electrolyse and crystalise it into lithium hydroxide monohydrate. Lithium electrolysis, for environmental, infrastructure and economic reasons, is Vulcan's selected process for lithium hydroxide production for battery electric vehicles.

Another hybrid team of around 15 people, including experts from Nobian, Vulcan and external engineering teams, has been assembled to adapt Vulcan's CLP – Demo Plant design to Nobian's site at the Höchst Chemical Park. The Demo Plant will represent an approximately 1:200 scale of the first commercial plant. Approximately 95% of the equipment needed for the CLP – Demo Plant has been ordered ahead of commissioning, which is expected to start in Q4 2022.

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.



Above: 3D image of the lithium hydroxide Demo Plant "LiLy".

Laboratory

Vulcan opened its new laboratory in Karlsruhe-Durlach, Germany in February 2022. Dr Angela Digennaro leads five experts focused on refining the processing of Vulcan's lithium product with zero carbon footprint. They will use the expanded laboratory to deepen their understanding of the lithium processing and to optimise the process to inform the Definitive Feasibility Study (DFS).

Importantly, the acquisition of new instruments including an ICP-OES and an IC, enhance the team's efficiency and reduces analysis waiting time. The brine can be fully characterised rapidly, and the team can gather information and react fast to support operation at the pilot plant.

Vulcan's newly opened laboratory in Durlach-Karlsruhe

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DLE Pilot Plant

Designed, built and commissioned in-house, Vulcan's Pilot Plant has been in operation for 12 months, with seven engineers and technicians supporting the on-site operation, under the leadership of Dr. Thomas Aicher. Using 'live' geothermal brine coming directly from an operational geothermal plant, the team are conducting a number of test programs with varying operating parameters, such as flow rates, temperature, cycle times.

The team continues to successfully demonstrate multi-cycle sorption tests on Upper Rhine Valley geothermal brine using multiple commercially available aluminate-based sorbents, including from Vulcan's partners such as DuPont.

Additional lab equipment has been acquired, and more technicians recruited to support further on-site analysis, while larger columns containing sorbents are being installed to increase sample production.

This thorough test work produces crucial data needed for de-risking the lithium extraction process. Consistent lithium concentration and low level of impurities are being reported, together with lithium recovery rates averaging 94-95%, which are above the levels noted in the 2021 Pre-Feasibility Study.

Vulcan's DLE Pilot Plant, successfully in operation for 12 months

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Geothermal renewable energy division

In January 2022, Vulcan was awarded new exploration licences for geothermal energy and lithium in the Upper Rhine Valley, Germany, increasing the Company's granted licence area by nearly 50% to over 1,000km^2. Since the acquisition, the team has been focused on reviewing existing data and adding to Vulcan's project development pipeline. Vulcan's acquisition of the Insheim geothermal power plant in January 2022 established the company as a revenue generating, renewable energy producer. Vulcan has since formally taken over operations of the facility which has been renamed Natürlich Insheim. All existing employees were retained as part of the transition, and they have since been onboarded to Natürlich Insheim, a subsidiary of Vulcan Energy.

The Insheim plant acquisition is a significant first step in establishing Vulcan as a revenue generating, renewable energy producer, and Vulcan intends to build several further distributed geothermal renewable energy plants across the Upper Rhine Valley region, on a large scale. Discussions with multiple local stakeholders to provide renewable heating to communities have commenced and are ongoing, significantly at a time when German and European energy security is in unprecedented focus.

Vulcan acquired two electric drill rigs in November 2021 which can drill to the target depth required for geothermal energy wells in the Upper Rhine Valley, Germany. Refurbishment of the drill rigs has commenced to ensure optimal safety and efficiency during operation. Vulcan's two deep drilling rigs are a scarce, strategic asset for Vulcan, at a time when Germany is seeking to decarbonise its heating and deploy widespread deep geothermal development.

Vulcan's geothermal renewable energy plant, currently in commercial production

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Feasibility and financing

The kick-off of the Bankability Study process with BNP Paribas was completed this week, in advance of a planned financing process which will follow the DFS completion, during which time Vulcan will be advised by BNPP's team. Led by Vulcan's in-house team and supported by Hatch Ltd, the DFS is progressing on track to be finalised in the second half of 2022.

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.

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For and on behalf of the Board

Daniel Tydde | Company Secretary

Corporate Directory

Managing Director	Dr Francis Wedin
Chairman	Gavin Rezos
Executive Director, Germany	Dr Horst Kreuter
Non-Executive Director	Ranya Alkadamani
Non-Executive Director	Annie Liu
Non-Executive Director	Dr Heidi Grön
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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. 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. 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.