

# Vulcan Energy Resources Limited produces highest grade, lowest impurity lithium hydroxide to date

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Vulcan produces highest grade, lowest impurity lithium hydroxide to date from Zero Carbon Lithium&TRADE; Project

[Vulcan Energy Resources Ltd.](#) (Vulcan; ASX: VUL, FSE: VUL, the Company) is pleased to announce it has produced the highest grade, lowest impurity lithium hydroxide to date from its pilot plant, located at its commercially operational geothermal renewable energy plant, at its Zero Carbon Lithium&TRADE; Project.

## Highlights:

- Vulcan Energy Resources' (Vulcan; ASX: VUL) chemical engineering team has successfully produced the highest grade, lowest impurity lithium hydroxide (LiOH) to date from its pilot plant.
- The lithium hydroxide was produced from Vulcan's sorption pilot plant, located at Vulcan's commercial geothermal renewable energy plant in the Upper Rhine Valley Brine Field (URVBF) in Germany, with downstream electrolysis processing offsite, as per Vulcan's planned commercial Zero Carbon Lithium&TRADE; Project.
- The latest material produced graded 57.1% LiOH, easily exceeding the best-on-the-market battery grade specification of 56.5% LiOH required from offtake customers. Impurities were well below market specification minimums.
- The lithium chloride extracted by the sorbent in the pilot plant was recovered with water and sent offsite, where it was purified and concentrated by a third-party provider to prepare the lithium chloride for electrolysis to produce lithium hydroxide solution. The solution was then crystalized to produce battery grade lithium hydroxide monohydrate.
- The embodied renewable heat within Vulcan's brine enables it to use the commercially proven sorption method of lithium extraction, which produces a very high purity LiCl product, which in turn enables the use of Li electrolysis to directly produce very high grade, low impurity LiOH.
- Vulcan's pilot plant has been successfully operating since April 2021, and has now produced sufficient data to complete Vulcan's Phase 1 Definitive Feasibility Study (DFS), which is scheduled for Q1 '23.
- Works on the containerised Sorption Demonstration Plant are progressing well, which will serve to train Vulcan's operations team in a pre-commercial setting, prior to commercial production targeted for 2025.

Managing Director and CEO, Dr. Francis Wedin commented, "As our DFS draws towards its conclusion, we are encouraged by these latest highest grades and lowest impurities recorded to date, from LiCl production from our pilot plant, with electrolysis conducted offsite. The embodied renewable heat within our brine means we are able to leverage sorption, a commercially proven process to extract lithium from brines that requires heat to work. Sorption is highly selective, which means that we can produce a very pure LiCl eluate. This in turn means we are able to use lithium electrolysis, a method of producing lithium hydroxide directly which by its nature produces a very pure product, in excess of the purity required for use in Electric Vehicle (EV) batteries, with minimal reagent usage.

"Works are continuing apace on our Demo Plant and DFS, and we are looking forward to sharing further updates with our stakeholders in the coming months, as we continue to execute towards our target of first commercial production from our Zero Carbon Lithium&TRADE; Project in 2025."

## Contact

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Specification (ppm) 1242-44-2 (ppm)	
Al <10	0.3
B <10	0.2
Ca <10	<0.1
Cd <10	<0.02
Cr <10	<0.04
Cu <10	1.5
Fe <10	0.07
K <10	6.2
Mg <10	0.3
Mn <10	0.1
Na <30	18
Ni <10	<0.1
Pb <10	<0.2
S <100	2.6
Zn <10	0.3

Table 1: Specification of Vulcan's high grade, ultra-low impurity lithium hydroxide produced

Figure 1: Lithium hydroxide monohydrate, produced from chloride at Vulcan's pilot plant

Figures 2 and 3: Works continuing on Vulcan's Demo Plant

## About Vulcan

Founded in 2018, Vulcan's unique Zero Carbon Lithium&TRADE; Project aims to decarbonise lithium production, through developing the world's first carbon neutral, zero fossil fuels 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 is aiming to deliver a local source of sustainable lithium for Europe, built around a net zero carbon strategy with a strict exclusion of fossil fuels. 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 Europe, with license areas in the Upper Rhine Valley, Germany, and in Italy. Strategically placed in the heart of the European electric vehicle market to decarbonise the supply chain, Vulcan is rapidly advancing the Zero Carbon Lithium&TRADE; Project to ensure 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 Integrity, Leadership, Future-focused and Sustainability, and united by a passion for environmentalism 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 who share its decarbonisation ambitions and has binding lithium offtake agreements with some of the largest cathode, battery and automakers in the world. As a motivated disruptor, Vulcan will leverage its expert multidisciplinary team, leading geothermal technology and position in the European EV supply chain to be global leaders in the production of zero fossil fuel, carbon neutral lithium, while being nature positive. Vulcan aims to be the largest, most preferred, strategic supplier of lithium chemicals and renewable power and heating from Europe, for Europe; to empower a net zero carbon future.

#### 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

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

#### Reporting calendar

## 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.

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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](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.

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