

Vulcan granted new licence for expansion into Frankfurt

Vulcan to use geothermal renewable energy to decarbonise large industrial areas of Frankfurt through heat supply with potential for lithium extraction

Jointly funded first research well with City of Frankfurt support completed in the region, testing underway for heat and lithium extraction

Vulcan Energy Resources Limited (Vulcan; ASX: VUL, FSE: VUL, the Company), the renewable energy producer and carbon neutral lithium developer, has been granted a new geothermal and lithium brine exploration licence, designated Luftbrücke, covering a region of Frankfurt am Main, an area with potential industrial customers like the Höchst Chemical Park and Frankfurt Airport.

Highlights

- The Luftbrücke license, in the Frankfurt region, includes a number of large industrial areas including the Höchst Chemical Park, and Frankfurt Airport, which are all heavy energy consumers requiring large quantities of renewable energy and heating solutions.
- Frankfurt has a high heat demand in the range of 6 to 12 TWh/a. It is also very carbon intensive, with almost 80% fossil energy sources, mainly gas and coal.¹
- The City of Frankfurt aims to achieve carbon neutrality by 2035. The German Federal Government aims for 100 new geothermal projects to be built by 2030, with affordable, baseload renewable heat.
- Given Frankfurt's high heat demand, there is a significant commercial and decarbonisation opportunity for Vulcan Energy via geothermal renewable energy development in Luftbrücke.
- The license is proximal to Vulcan's Central Lithium Plant (CLP) development, at the Höchst Chemical Park, providing further opportunities for cheaper energy and decarbonisation as Vulcan aims to grow its lithium chemicals production in a phased, stepwise manner.
- Vulcan has invested in a joint research well in the region together with the City of Frankfurt, the Hessian Ministry of Economics, the LandesEnergieAgentur Hessen GmbH (LEA), the state geological survey, the BäderBetriebe Frankfurt GmbH, Mainova AG, the Leibniz Institute of Applied Geophysics (LIAG) and GLU Freiberg GmbH to test the heat and lithium concentrations. The well has been drilled, and brine sampling and analysis work is under way. Vulcan is also assessing whether the high lithium concentrations in the Buntsandstein brine reservoir extend into the "Rotliegend" brine reservoir to the north under Luftbrücke.
- This new licence and recent collaboration with the City of Frankfurt is a strong signal to renewable energy developers that Germany is unlocking demand for renewable heating to de-risk its reliance on foreign fossil gas.
- Luftbrücke covers 207 km² at the northernmost extent of Vulcan's Zero Carbon Lithium™ Project area, which in the process has grown by 13% to over 1,790km², in the Upper Rhine Valley Brine Field (URVBF) across Germany and France.

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- Vulcan’s aim is to build combined renewable energy and lithium production projects across the URVBF, in a stepwise, phased manner. Further geothermal brine production for heating can unlock greater lithium production, which will be supplied to Vulcan’s automotive customers in Europe.
- Vulcan’s team is focused on the execution of Phase One of its Zero Carbon Lithium™ Project, which combines geothermal renewable energy and lithium production in the core of the URVBF. Vulcan is in discussions with strategic partners on the co-development of the next phases of its project development, including Luftbrücke, which would offer significant stakeholder value.

“This new licence signifies a major future phase opportunity for Vulcan as a dual lithium and geothermal energy producer,” said Managing Director and CEO Cris Moreno. “We have a strong presence already in the region as we progress towards commissioning of our Central Lithium Electrolysis Optimisation Plant located in Höchst Chemical Park, which will also be the location of our Central Lithium Plant for our Phase One commercial operations. We look forward to growing our relationship with the Frankfurt region and its stakeholders to support their energy transition to meet their carbon neutral goals by 2035.”

Luftbrücke licence: potential commercial decarbonisation opportunities for renewable heating.

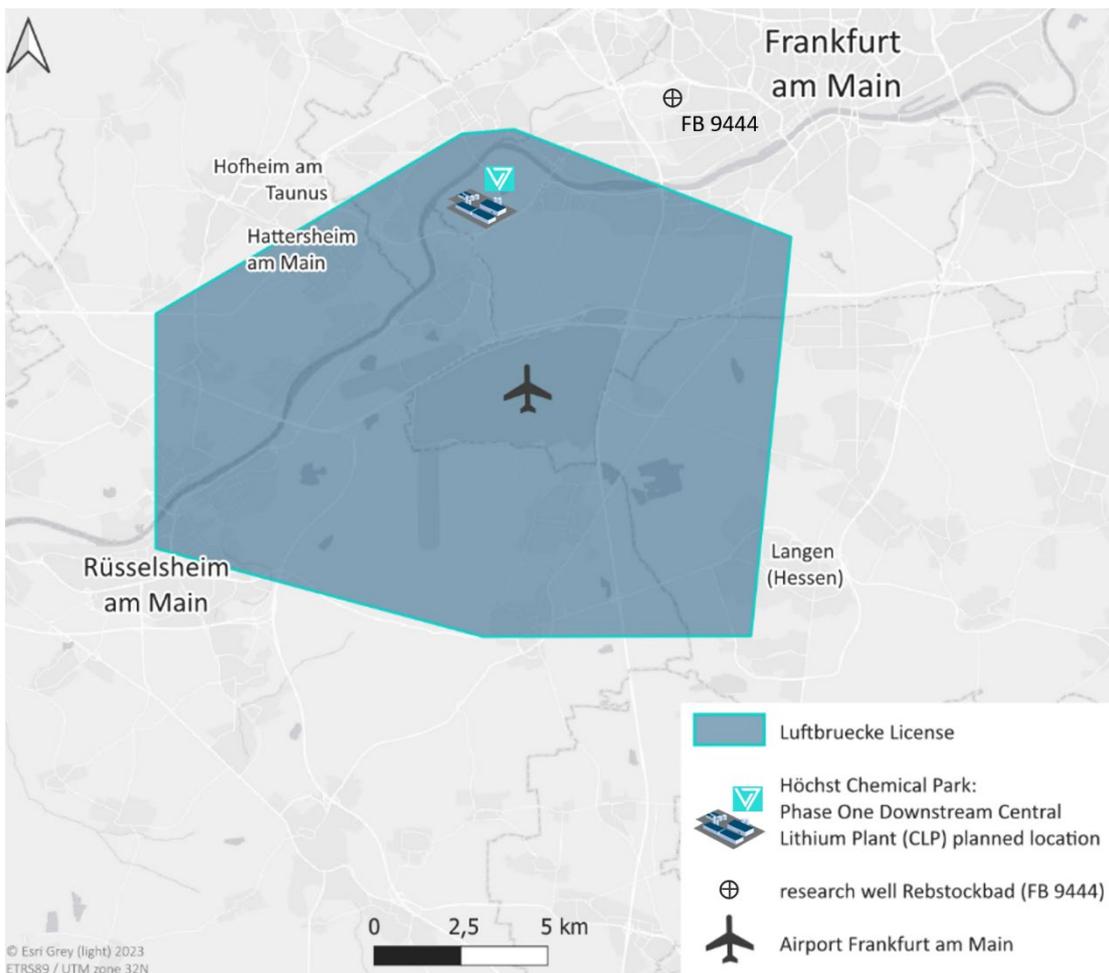


Figure 1 Luftbrücke licence area

Upper Rhine Valley Brine Field: Zero Carbon Lithium™ Project Area



Figure 2 Vulcan's Zero Carbon Lithium™ Project Area with licence status

About Vulcan

Founded in 2018, Vulcan's unique Zero Carbon Lithium™ Project aims to decarbonise lithium production, through developing the world's first net 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 net zero carbon strategy with 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 Europe¹, with license areas focused on the Upper Rhine Valley, Germany. 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. As a motivated disruptor, 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 zero fossil fuel, net 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.



¹ According to public, JORC-compliant data. See Phase One DFS announcement, 13 February 2023.



Corporate Directory

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Executive Director, Germany	Dr. Horst Kreuter
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For and on behalf of the Board

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Reporting calendar

27 October 2023	September Quarterly
29 January 2024	December Quarterly Report
28 March 2024	Annual Report

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Vulcan has carried out a definitive feasibility study for Phase One of its Zero Carbon Lithium™ Project ('Project'), the results of which were announced to the ASX in the announcement "Zero Carbon Lithium Project Phase 1 DFS Results" dated 13 February 2023 ('DFS'), ('DFS Announcement'). This announcement may include certain information relating to the DFS. The DFS is based on the material assumptions outlined in the DFS Announcement (see "Competent Person Statement" below). 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 DFS will be achieved. This announcement 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 Mineral Resources and Ore Reserves, and any Exploration Results and Production Targets, of Vulcan's Zero Carbon Lithium™ Project is extracted from the DFS Announcement, which is available to view on Vulcan's website at www.v-er.eu. Vulcan confirms that in respect of estimates of Mineral Resources and Ore Reserves, and any Exploration Results and Production Targets, included in this announcement:

- 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;
- the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement; and
- all material assumptions underpinning any production targets (and any forecast financial information derived from such production targets) included in this announcement continue to apply and have not materially changed.



ⁱ Prohaska et al. (2020): Heating and cooling strategies for pilot cities – Frankfurt, Hotmaps deliverable D6.3.
https://www.hotmaps-project.eu/wp-content/uploads/2020/10/Hotmaps_D.6.3_Frankfurt-HC-Strategies_FINAL_reduced.pdf<https://www.hotmaps-project.eu/>