



VULCAN ENERGY
ZERO CARBON LITHIUM™

The Production of Zero Carbon Lithium™ from Geothermal Brine in the Upper Rhine Valley in Southwest Germany

Li network meeting 2022 in Wroclaw

Dr. Jens C. Grimmer



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Vulcan Energy Resources Ltd. / Vulcan Energie Ressourcen GmbH

Ltd founded in Perth /
Australia. Founder:
Dr. Francis Wedin &
Dr. Horst Kreuter

2018

Vulcan Energie
Ressourcen GmbH
founded in Karlsruhe

IPO in Australia
(ASX)

2019

Generation of PFS
based on JORC mining
code

2020

Pilot plant onsite in
Landau: first lithium
produced
Start: April 2021

2021

Demonstration plant
Start: summer 2022

Team has grown
From 2 to >130 employees
end of 2022: >200

Listing at Prime
Standard (Frankfurt
stock exchange)

2022



Acquisition of
Founding of deep
drilling company

VERCANA

Acquisition of
Geothermal power plant
Insheim

Natür³Lich Insheim

Goal:

CO₂-free lithium production
for battery production in Europe

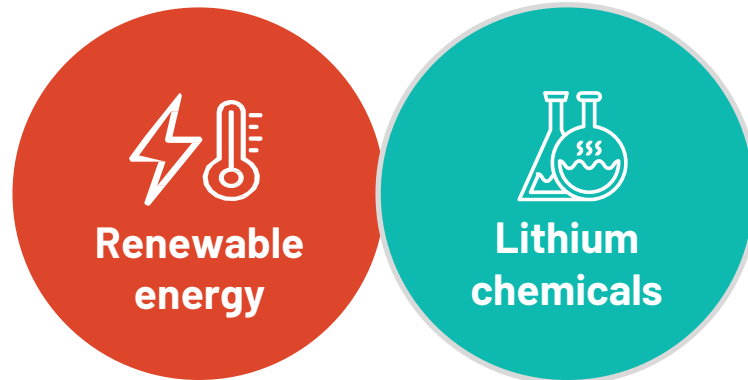
CO₂-free energy supply
Heat
Cold
Electricity

07/2022 renaming
VER: Management, DLE-Team, Lab, PR
VES: VE Subsurface solutions
VEE: VE Engineering
VNI: Insheim geothermal power plant
Vercana: Drilling department

Introduction

Vulcan Energy Resources 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.

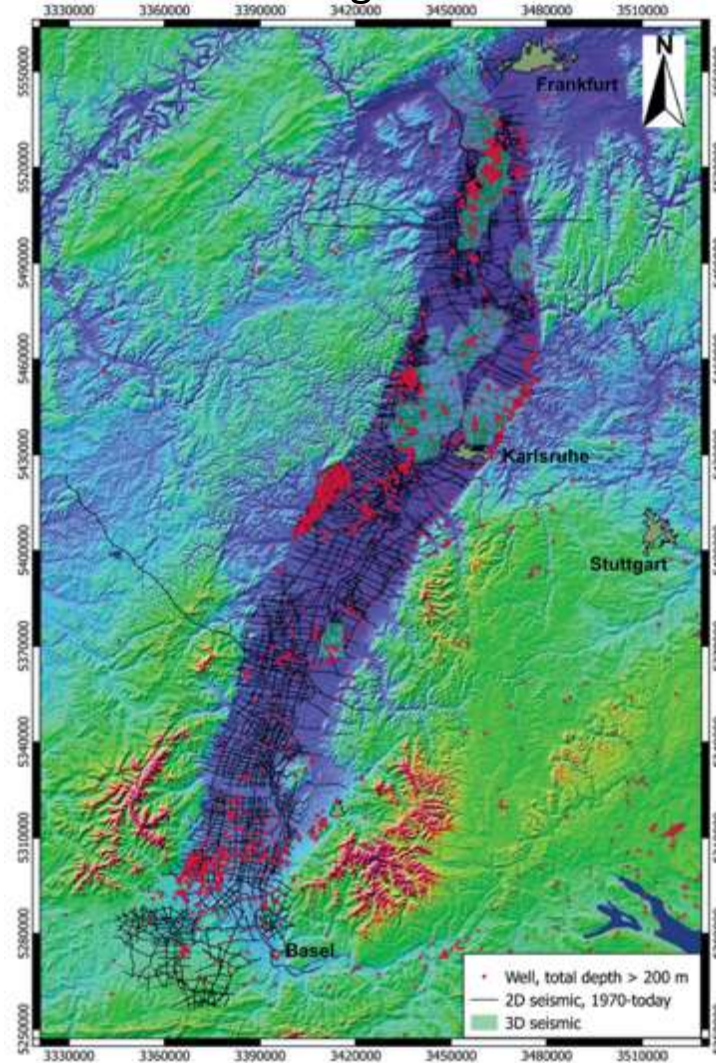


**Right place, right time
for fully integrated renewable energy and
sustainable lithium chemicals business in Europe**



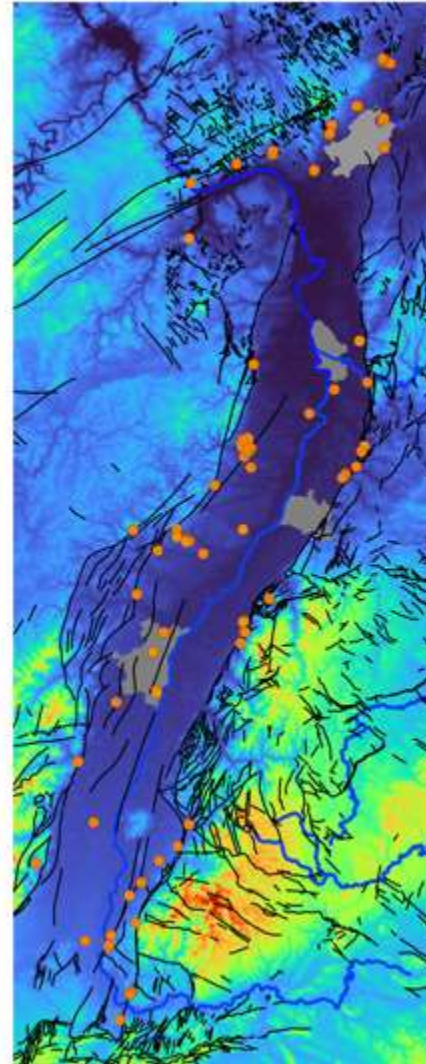
The right place: Upper Rhine Graben's Lithium and Geothermal potential

Geological data

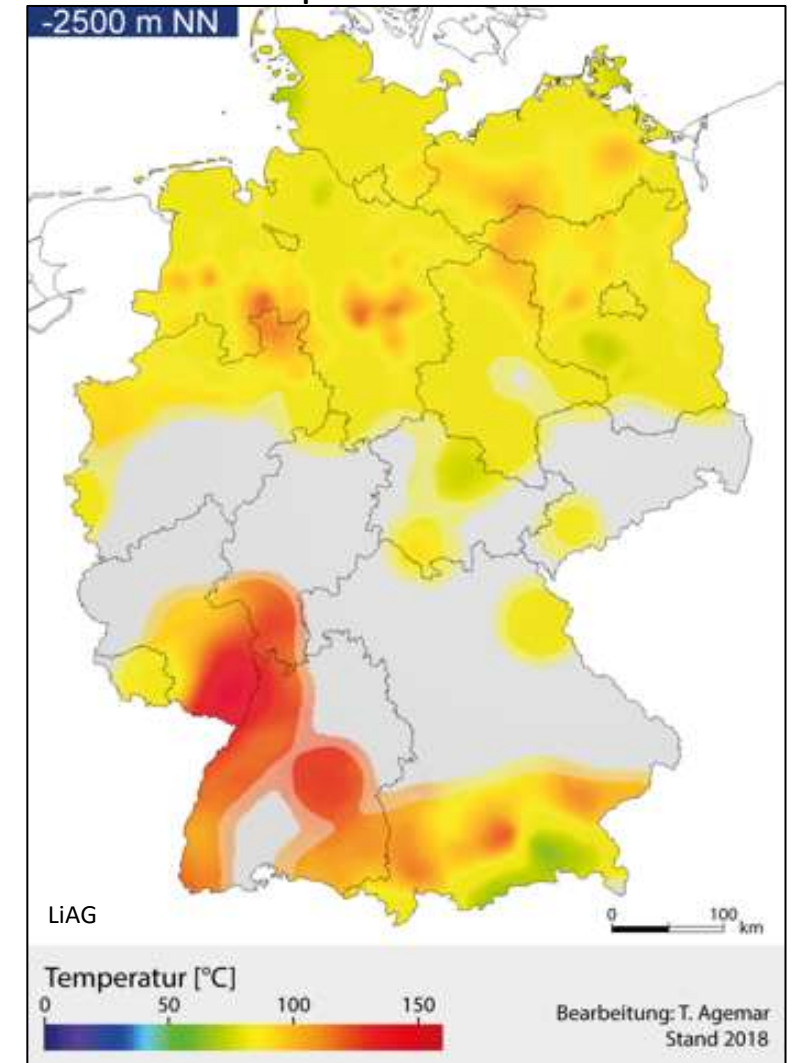


Reinhold et al. (2016)

Lithium data



Temperature data



The right place: convection

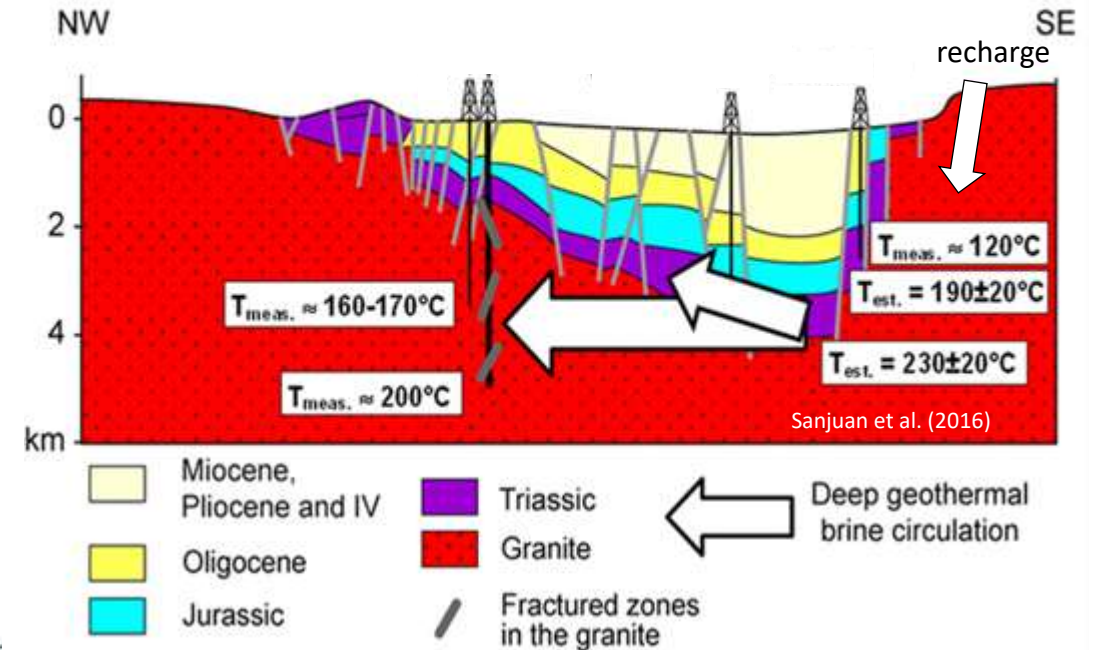
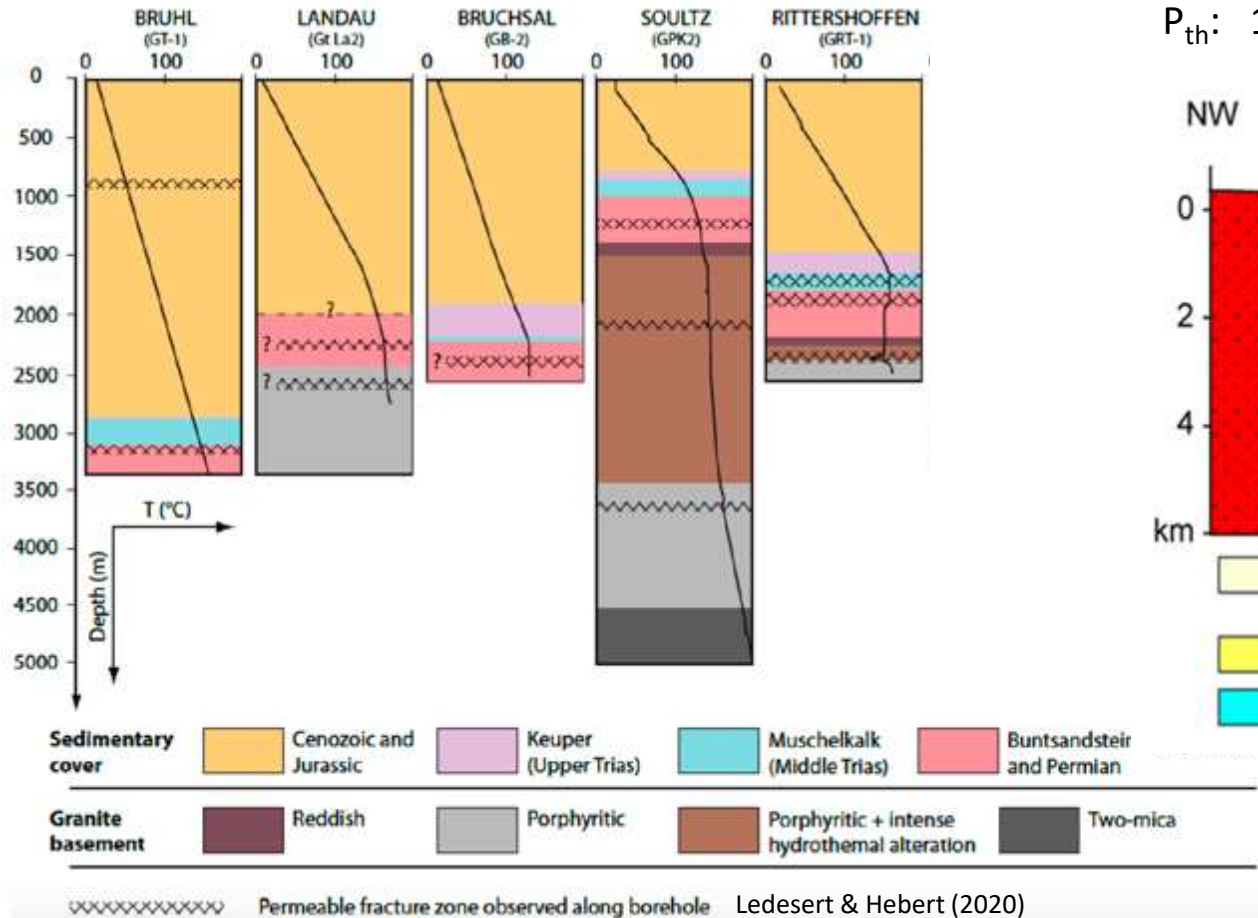


Installed capacities

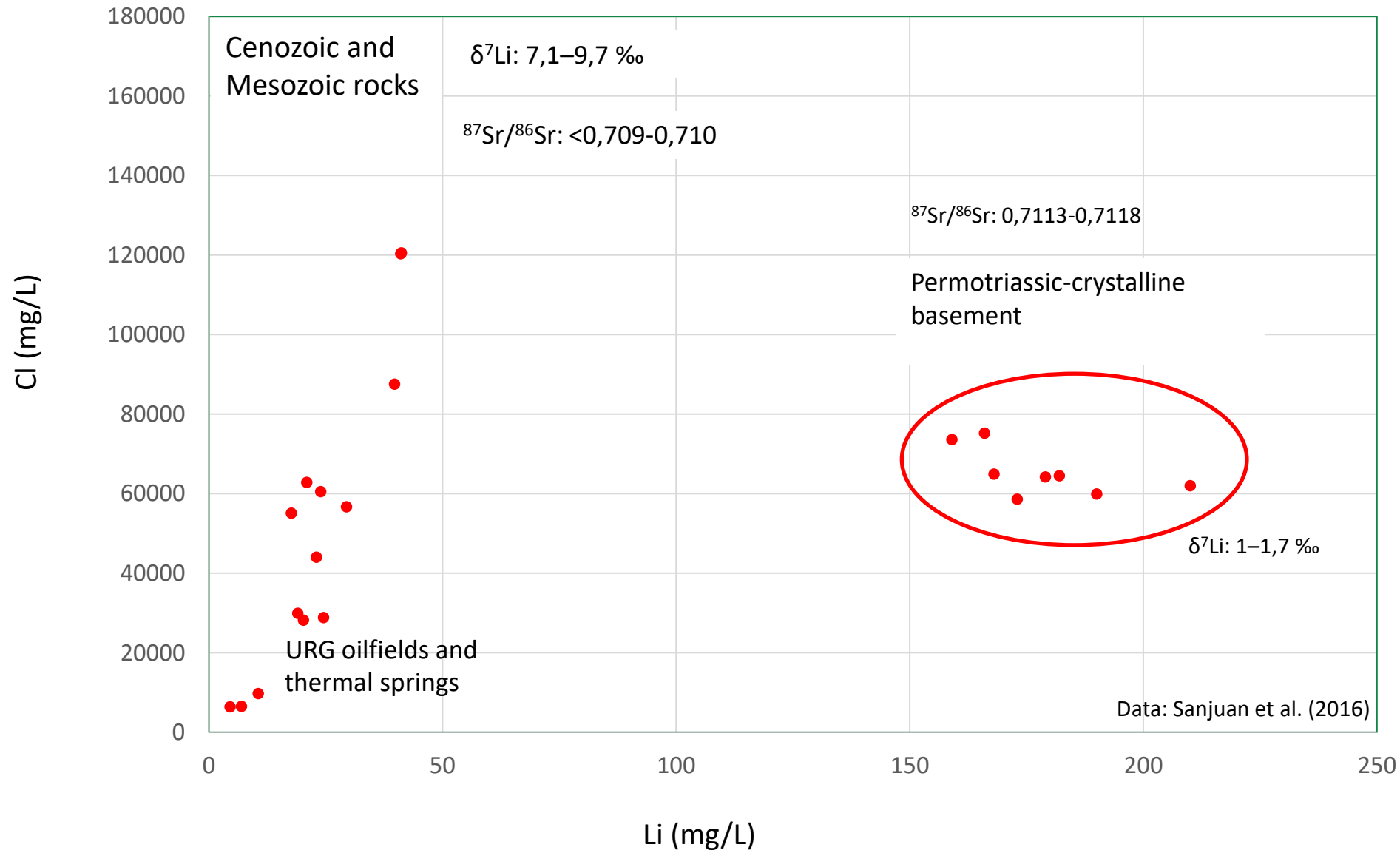
(5 geothermal power plants)

P_{el} : 11 MW

P_{th} : 106 MW



The right place: brine composition

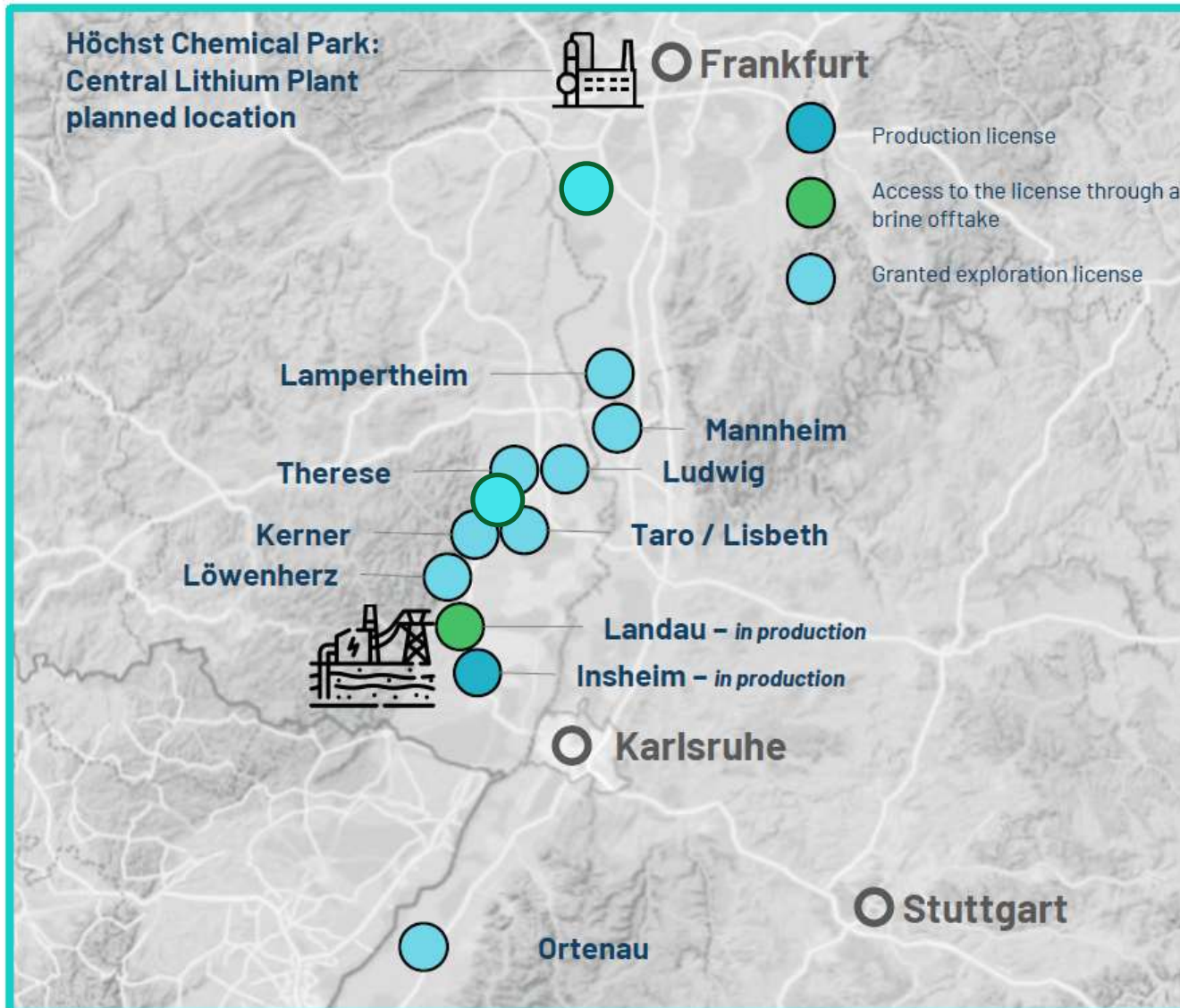


Geothermal brines
 relatively
 homogeneous
 composition

low variations of Li
 concentrations

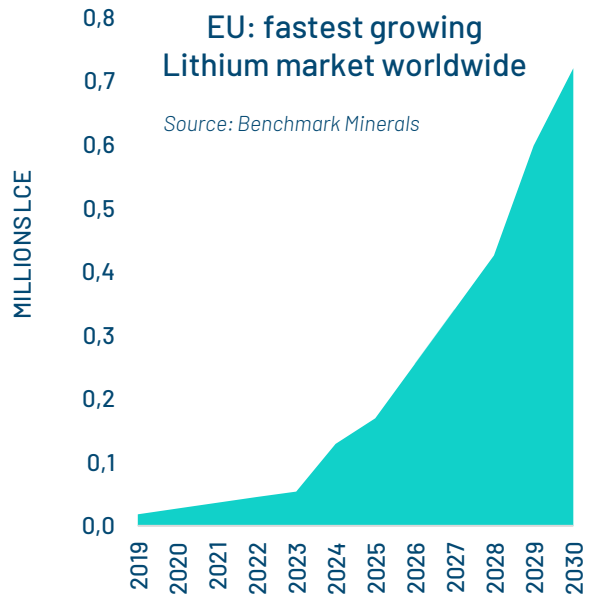
Landau: >13 years
 Insheim: >8 years

E&P licensing of VUL

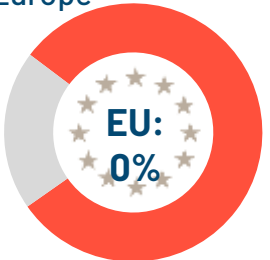


- 10 exploration licenses
 - >1400 km²
- 1 production license (Insheim)
- 1 brine offtake agreement (Landau)
- 2 license fields pending

The right time: growing lithium demand



No yet regional production of Lithium hydroxide in Europe



CHINA: > 80%
Source: Benchmark Minerals

PRC: currently the only country covering entire Li value chain from Li mining, LiOH conversion, battery cell to EV production

EU Lithium-Ionen Batteriekapazität

>1,000GWh LITHIUM-IONEN BATTERIEKAPAZITÄT bis 2030 GEPLANT

Quelle: CIC energiGune 09/2021

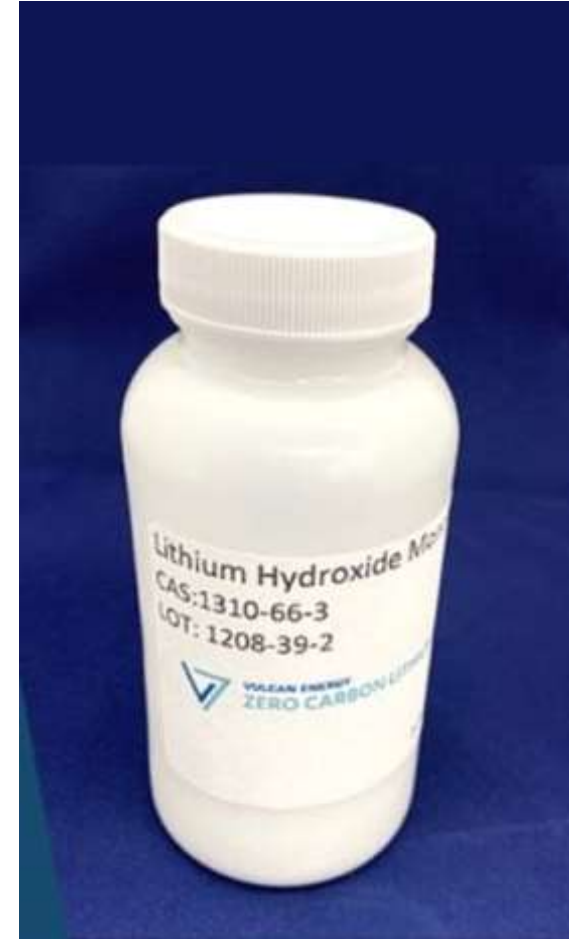
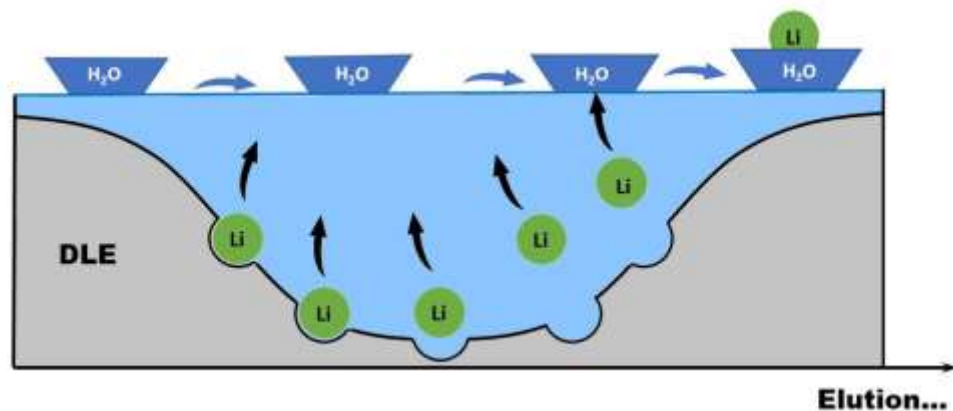
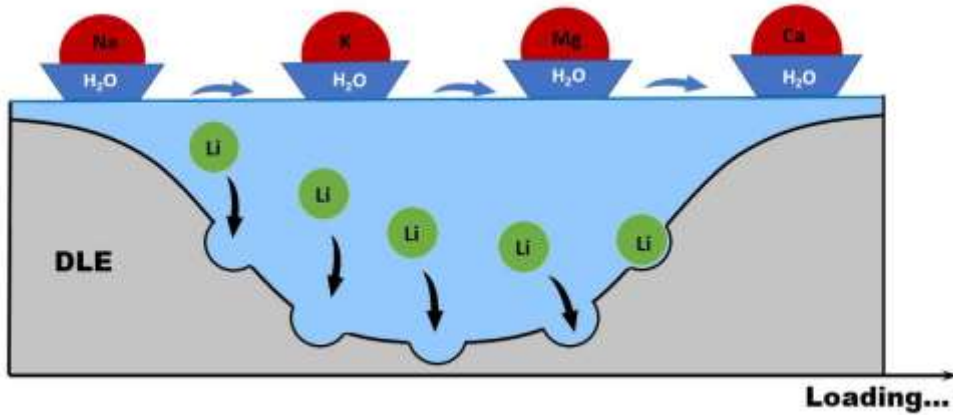


Our first lithium hydroxide

First lithium hydroxide produced by pilot plant in Sept./Okt. 2021

Construction of on-site demonstration plant has started

Quality / purity of lithium hydroxide is better than required by battery producers



Production goals for 2025:

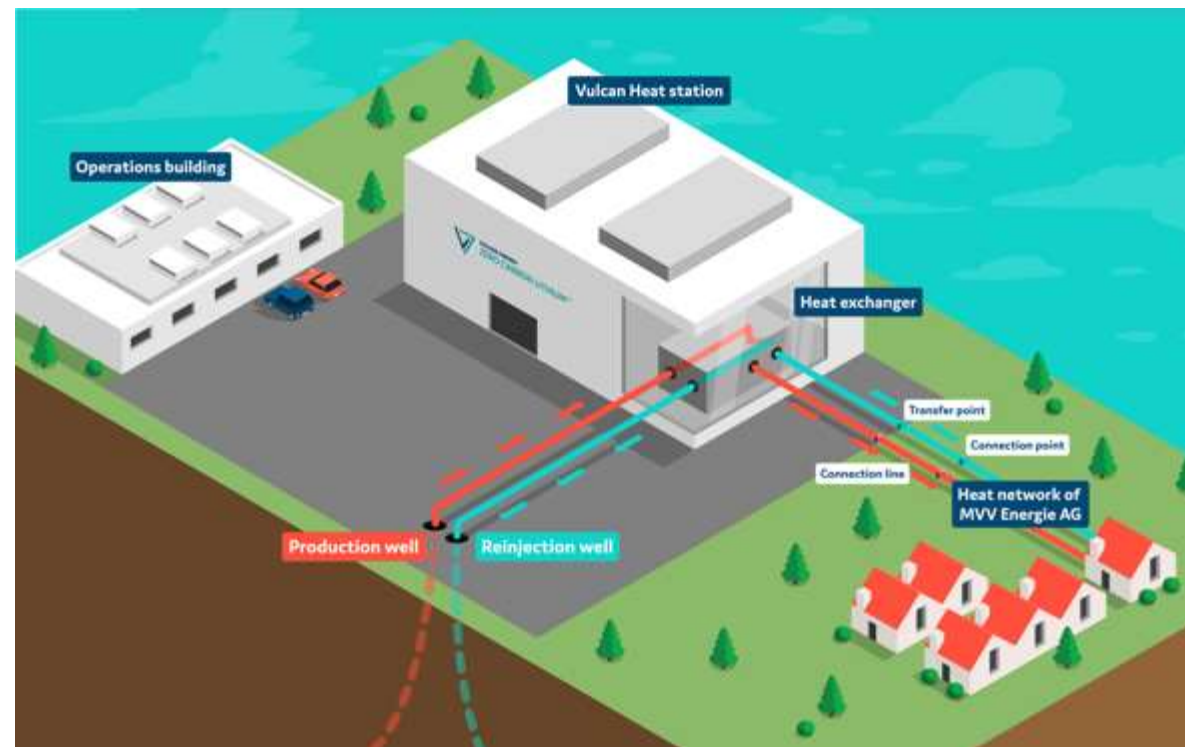
- 40.000 t lithium hydroxide per year
- batteries for c. 1 million EV per year

Right time: demand of renewable, zero carbon heat



First of a number of planned district heating arrangements from geothermal energy to help decarbonization of energy supply

- ▶ Vulcan and MVV Energie AG (MVV) have executed a binding purchase agreement for 240 GWh per year of renewable heat, a first for Germany.
- ▶ 20-year, long-term agreement commences in 2025.
- ▶ Includes the supply of a minimum of 240 GWh per year to a maximum of 350 GWh per year.
- ▶ The heat will be supplied from Vulcan's planned geothermal wells in the area surrounding the City of Mannheim.
- ▶ Vulcan is developing its Mannheim license as part of a planned larger Phase 2 of the Zero Carbon Lithium™ Project.



Heat will be transferred via heating grids and a series of underground pipes that deliver hot water or steam to buildings in the local community.

Dual revenues: energy and lithium



ENERGY BUSINESS



Renewable Electricity:
Geothermal energy in the form of electricity is sold to the grid

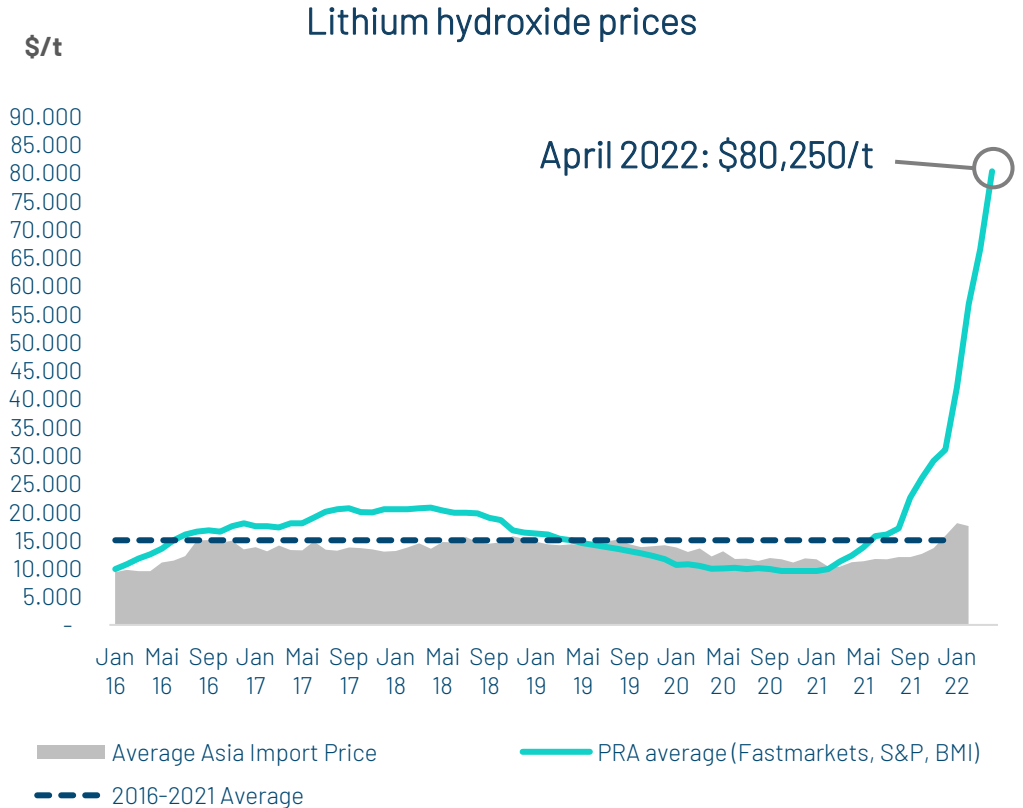
Renewable Heat: Energy in the form of heat can be sold to several public and private customers via pipes, proximity is a requirement

One heat offtake has been concluded and negotiations for additional offtakes with local stakeholders are under way



Vulcan Energy's 100% owned NaturLich Insheim, an operational geothermal renewable energy power plant in the Upper Rhine Valley, Germany.

LITHIUM BUSINESS



Source: Trade statistics compiled from Global Trade Atlas®, Benchmark Minerals (2016-2017), Fastmarkets (2017-2022)

Note 1: Refer to Appendix 15: The fossil-nuclear era in Europe is coming to an end

Leading environmental credentials



Per tonne of lithium hydroxide produced



 **Hard rock mining**
60% of world lithium production

 **Evaporation ponds**
40% of world lithium production

 **VULCAN ENERGIE**
ZERO CARBON LITHIUM™

Source: Minviro Life Cycle Analysis 2021 & Vulcan Energy's Pre-Feasibility Study

Note 1: The Company's environmental credentials set out in this slide (and elsewhere in this Presentation) are based on the Company's Pre-Feasibility Study. There is no guarantee that the Company will be able to achieve the targeted metrics.

Conclusion



Commercial geothermal plant in operation



Electric drill rigs acquired



Europe's largest lithium Resource. Granted license area increased to over 1,000km²



Site for Central Lithium Plant secured



AUD\$320 million capital raised



Five binding lithium offtake agreements



LCA results with negative CO₂ emission intensity



Vulcan team now >100 personnel and growing



Dual listed on the regulated market (Prime Standard) of the FSE

