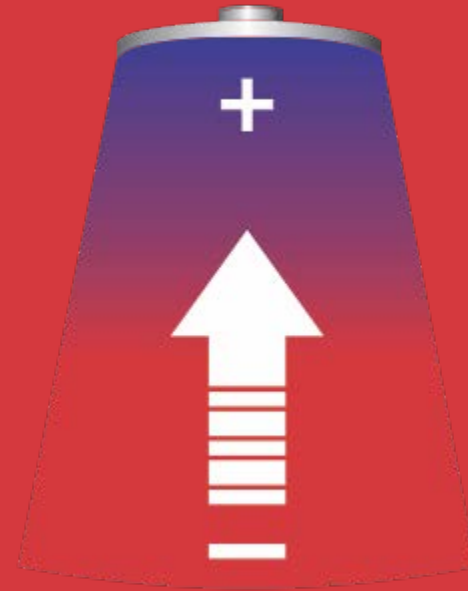




**KOPPAR**  
RESOURCES  
ASX: KRX



# VULCAN PROJECT ZERO CARBON LITHIUM

August 2019

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## Competent Person Statement

The information in this presentation that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Dr Francis Wedin, who is a member of the Australasian Institute of Mining and Metallurgy. Dr Wedin is joining KRX as a full time employee and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a competent person as defined in the 2012 Edition of the "Australasian Code for reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves" (JORC Code). Dr Wedin consents to the inclusion in this presentation of the matters based upon the information in the form and context in which it appears. The information in this report that relates to the Exploration Targets are based on, and fairly reflects, information compiled by Mr. Roy Eccles P. Geol. and Mr. Steven Nicholls MAIG, who are both full time employees of APEX Geoscience Ltd. and deemed to be both a 'Competent Person'. Both Mr. Eccles and Mr. Nicholls have sufficient experience relevant to the style of mineralization and type of deposit under consideration and to the activity which they are undertaking to qualify as Competent Person as defined in the 2012 Edition of the Australian Code for the Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code). Mr. Eccles has reported to the scientific community, and as a geological consultant on exploration and resource related lithium-brine work, since 2010, specializing in confined, subsurface lithium-brine deposits in the Western Canada Sedimentary Basin, and the southern United States. Mr. Eccles and Mr. Nicholls consent to the disclosure of information in this report in the form and context in which it appears. The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

## **Potentially the Largest Lithium Project in EU**

Recent JORC Exploration Target<sup>1</sup> 10.73 – 36.20 Million Tonnes Contained Lithium Carbonate Equivalent (LCE)

## **Unique Zero-Carbon Lithium Production**

World-first to satisfy OEMs' stated desire for zero carbon EV raw materials supply chain

## **Secure Domestic Lithium Supply for EU**

Auto industry and governments desperate for security of supply, reduction of reliance on China

## **Only Lithium Brine Field in EU**

Ultra-low impact, recent precedent for permitting geothermal wells in region with widespread social acceptance

## **Rapid Advancement Plans**

Scoping Study under way, Hatch appointed as project engineering lead

<sup>1</sup>Refer KRX Announcement 20/08/2019. The Company is not aware of any new information or data that materially affects the information included in the announcement. All material assumptions and technical parameters underpinning the Exploration Target in the relevant announcement continue to apply and have not materially changed.

# Vulcan Project Principals



## Dr Francis Wedin, Proposed Managing Director

- Previously Executive Director of ASX-listed Exore Resources Ltd (ASX:ERX)
- PhD & BSc (Hons) in mineral exploration, completing MBA in renewables
- Discovered & defined 2 new JORC lithium resources, on two continents, in under a year, including Lynas Find, now part of Pilbara Minerals' Pilgangoora Project (ASX:PLS)
- Management experience in resources sector on four continents; bilingual; EU & Australian dual nationality



## Gavin Rezos, Proposed Chairman

- Held Executive Chairman or CEO positions of two companies that grew from start-ups to entry into the ASX 300
- Extensive international investment banking experience, as an investment banking Director of HSBC with senior multi-regional roles in investment banking as well as in legal and compliance functions
- Currently Chairman of Resource and Energy Group and principal of Viaticus Capital. Previously Non-Executive Director of Iluka Resources, Alexium International Group and Rowing Australia



## Dr Horst Kreuter, In-Country Principal

- CEO of Geothermal Group Germany GmbH and GeoThermal Engineering GmbH (GeoT)
- Successful geothermal project development & permitting in Germany and worldwide
- Based in Karlsruhe, local to the project area in the Upper Rhine Valley
- Widespread political, investor and industry network in Germany and Europe



# Current Lithium Supply Problematic



## Hard-Rock Lithium

- High surface impact. Difficult to permit & operate in Europe
- High C-footprint from extraction, transport & processing
- Spodumene concentrate shipped to & refined in China. No strategic advantage for mining



## Salar-Type Lithium Brine

- High carbon footprint for reagent and product transport:
  - Soda Ash USA → Chile (10,000km)
  - $\text{Li}_2\text{CO}_3$  Chile →  $\text{LiOH}$  USA → Cathode Asia → Battery/EV USA → EU Customer (50,000km)
- Uses large amounts of water in one of the driest places on earth; future license to operate?
- Evaporation process takes a long time (up to 12 months)
- Vulnerable to weather events

Exclusive

**Lithium firms depleting vital water supplies in Chile, analysis suggests**

*Battery-grade Li Supply Shortfall Forecast. The market is ripe for disruption.*

# Zero Carbon Supply Chains Required

- BEV raw material supply chains have a carbon footprint problem
- OEMs are actively trying to reduce the carbon footprint of their battery supply chains to bolster the credibility of their BEV offerings
- E.g. Volkswagen is placing great importance on having a CO<sub>2</sub>-neutral production supply chain for its new EV line-up, with sustainability metric for suppliers on par with price<sup>2</sup>



**Our vision is 100% CO<sub>2</sub>-neutral E-mobility**  
Decarbonisation concept

**Volkswagen's delivery promise**



CO<sub>2</sub>-neutral production incl. supply chain

Zero-emission vehicle

Vision

Sustainability as selection criteria on par with quality or price



*How will they achieve this through conventionally-extracted lithium?*

**HV Battery Cathode**

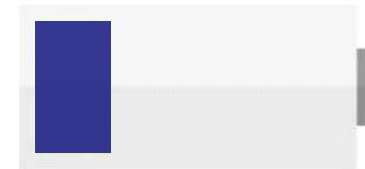
**Background**

- Cathode production and sub-supply chain (raw material production) expected to be CO<sub>2</sub> hot-spot

# EU Domestic Supply of Lithium Required



- Currently **zero** EU supply of battery-grade lithium
- Phase out of fossil fuel-powered vehicle sales commencing
- 150kt per annum of LCE<sup>1</sup> needed in EU by 2023, 290kt by 2028
- Majority of lithium supply controlled by just 5 companies, all non-EU
- Auto manufacturers & governments desperately need security of lithium supply in the 21st Century for the transition to BEVs, instead of relying solely on South American and Chinese production



16% of global Li demand for battery manufacture by 2028



0% of global battery-grade Li supply

*"Lithium refining is being promoted as part of a broader strategic push to develop an entire battery value-chain inside Europe."*

*Maroš Šefčovič, vice-president of the European Commission energy union 11/2018*

**Sweden's Northvolt raises \$1 billion to complete funding for mammoth battery plant**

**CATL boosts battery cell factory in Germany to 100GWh**

CATL factory could be at least as big as Tesla's Gigafactory

**Volkswagen's CEO said they are capable of building 50 million electric vehicles**

*Who will supply?*



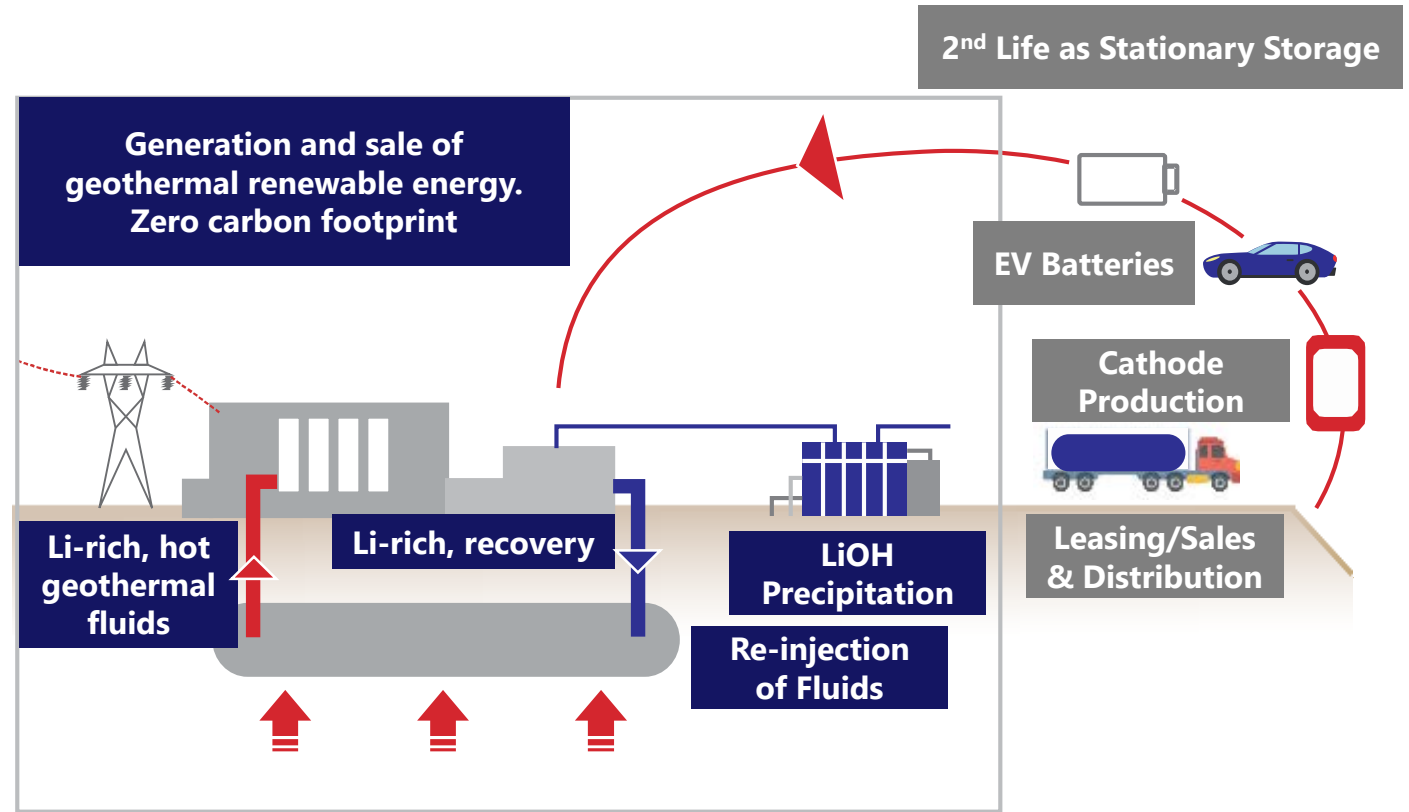
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<sup>1</sup>refer ASX Announcement 10 July 2019

# Solution: Zero-Carbon Lithium in Germany



- Well understood geothermal brine field with **uniquely high lithium grade**
- Dual-purpose wells to be drilled
- Renewable energy to **offset** processing **energy** for lithium plant
- Direct precipitation of lithium hydroxide to be used, **avoiding evaporation**, with no pre-heating of hot fluids required – major advantage
- Filtered waters to be re-injected into aquifer - no drawdown on water table
- **Zero-Carbon Lithium** to be produced locally & transported to nearby battery factories



*Zero Carbon Lithium – Potential for a World-First*





# Potential to be the Largest Lithium Project in Europe



Contained LCE (Mt)

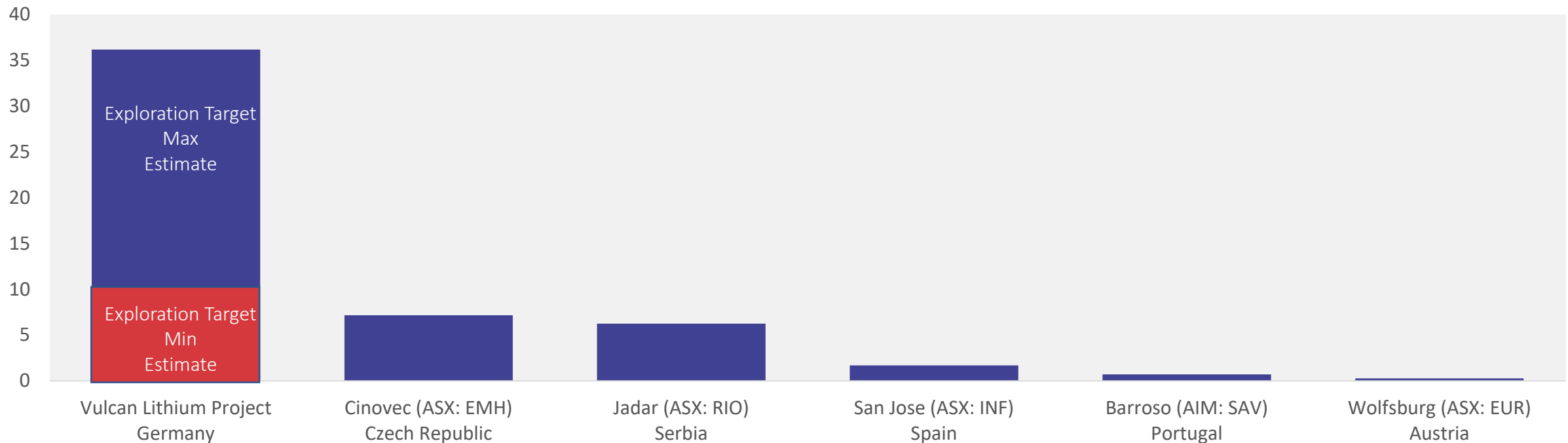
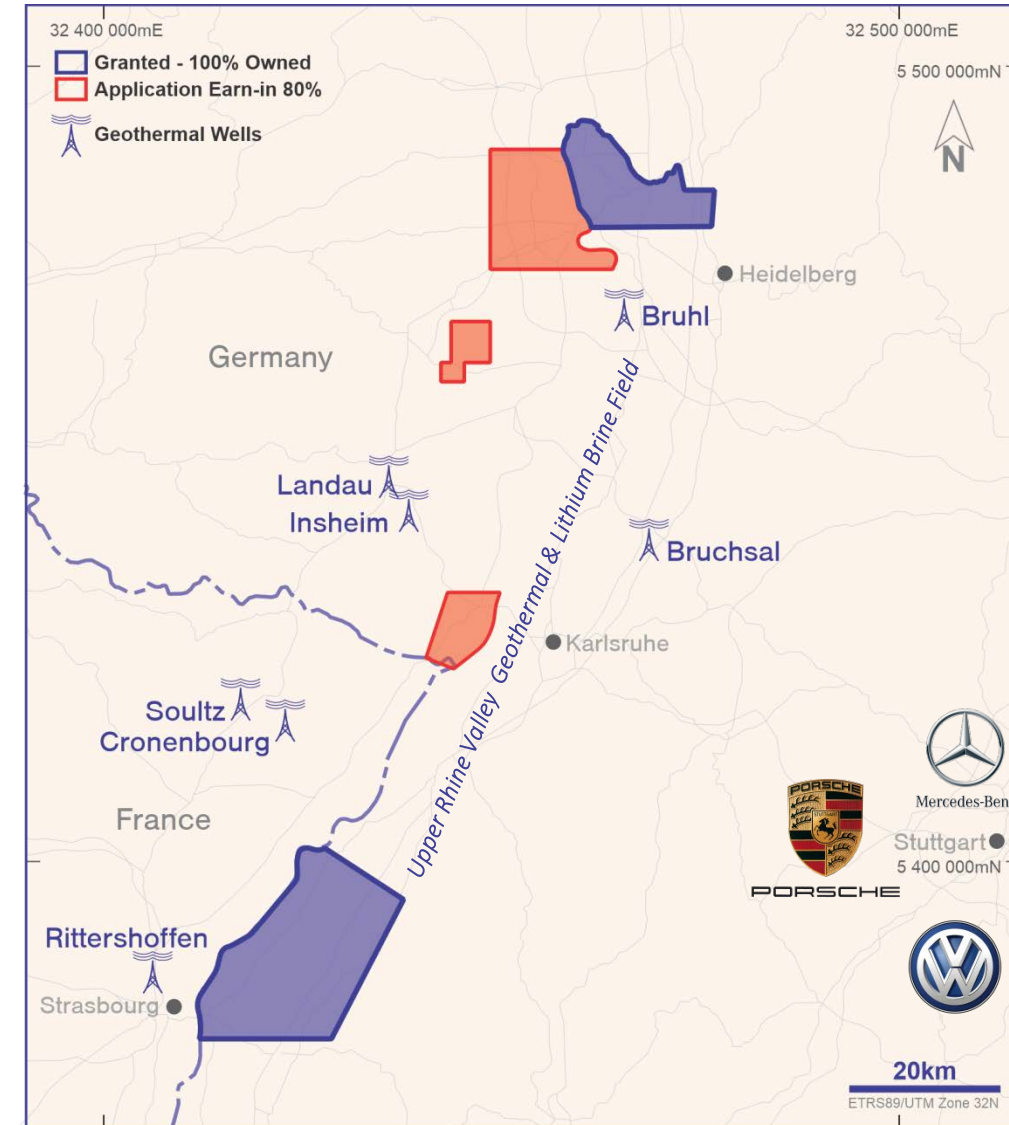


Chart compares resources from companies at different stages of development as detailed in Appendix 1, with Vulcan Lithium Project which is an Exploration Target expressed as a range of values as per KRX ASX announcement 20/08/2019. The Company is not aware of any new information or data that materially affects the information included in the announcement. All material assumptions and technical parameters underpinning the Exploration Target in the relevant announcement continue to apply and have not materially changed. The Exploration Target's potential quantity and grade is conceptual in nature, there has been insufficient exploration to estimate a Mineral Resource, and it is uncertain if further exploration will result in the estimation of a Mineral Resource.

# Well Understood Lithium and Geothermal Brine Field



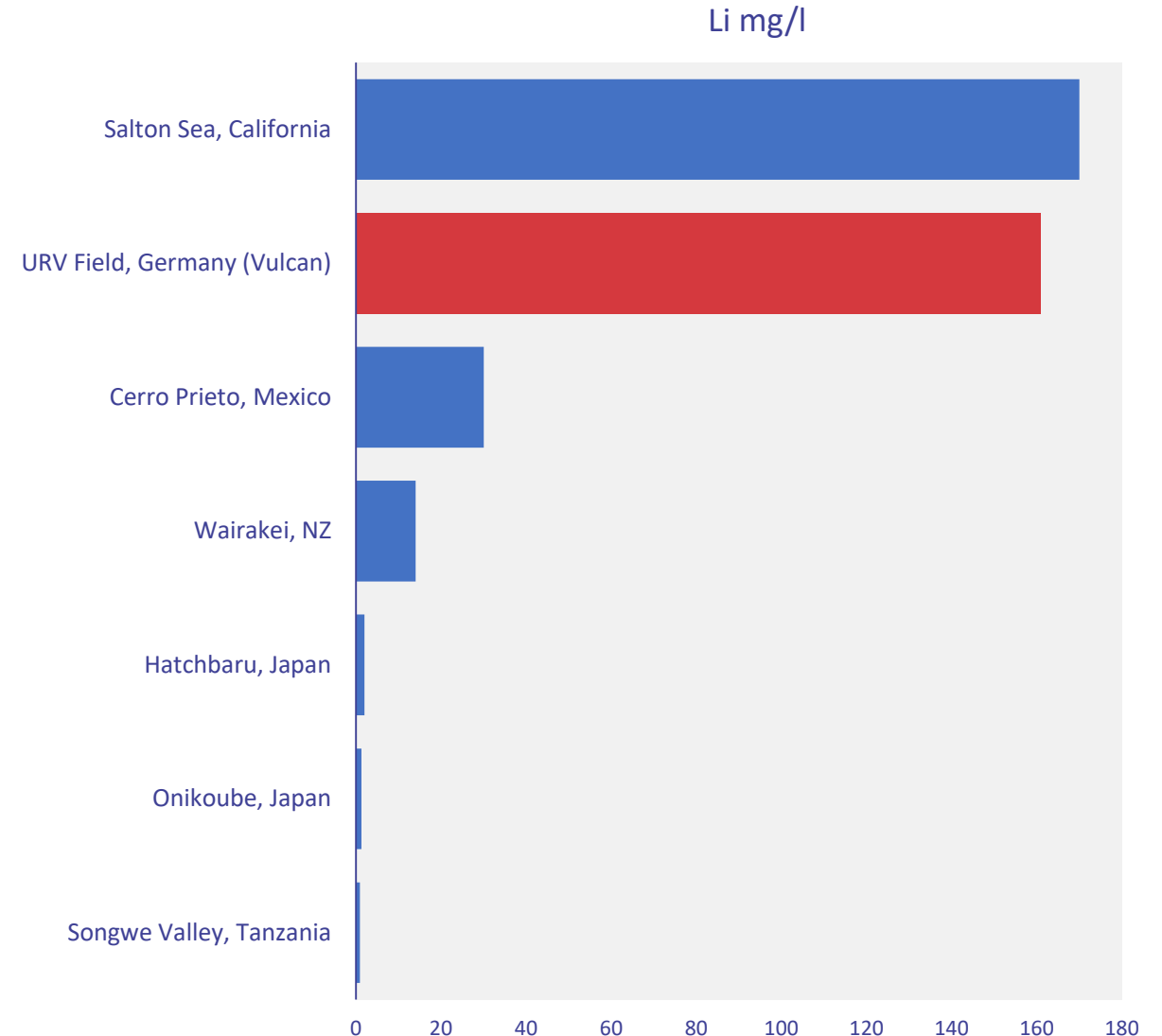
- Upper Rhine Valley geothermal fluids sampled over extended periods of time from multiple locations
- Grades<sup>1</sup> within the deep brine field up to 210mg/l Li
- Thick Buntsandstein reservoir unit generally at 2,500m depth and has an average porosity<sup>1</sup> of 10%
- **Commanding land position** in the brine field of over 78,600 Ha, of which over 51,000Ha is already granted
- Selected areas based on commissioned study, defining most promising aquifers – Li grade, flow rate, heat
- Very well understood brine field; large amounts of **existing seismic and drilling data available** for resource evaluation
- Potential advantage of very short product transport distance
- Scoping Study already under way



# URV Brine Field: Unique Lithium Grade Potential



- Areas with heated brines are common, but the fluids are rarely lithium rich
- Typical geothermal brine fields have Li values in the order of 1-10 mg/l Li<sup>1</sup>
- URV geothermal brine field exhibits Li values one to **two orders of magnitude** greater<sup>1</sup>: up to 210 mg/l Li, commonly >150 mg/l Li
- Only other known geothermal field in the World with similar lithium grades and flow rate is Salton Sea, California<sup>1</sup>
- **Same order of magnitude of Li grade** as South American Li salar brines, but with processing advantage of being already heated
- URV field also exhibits low average Mg : Li ratios of 0.73<sup>1</sup>

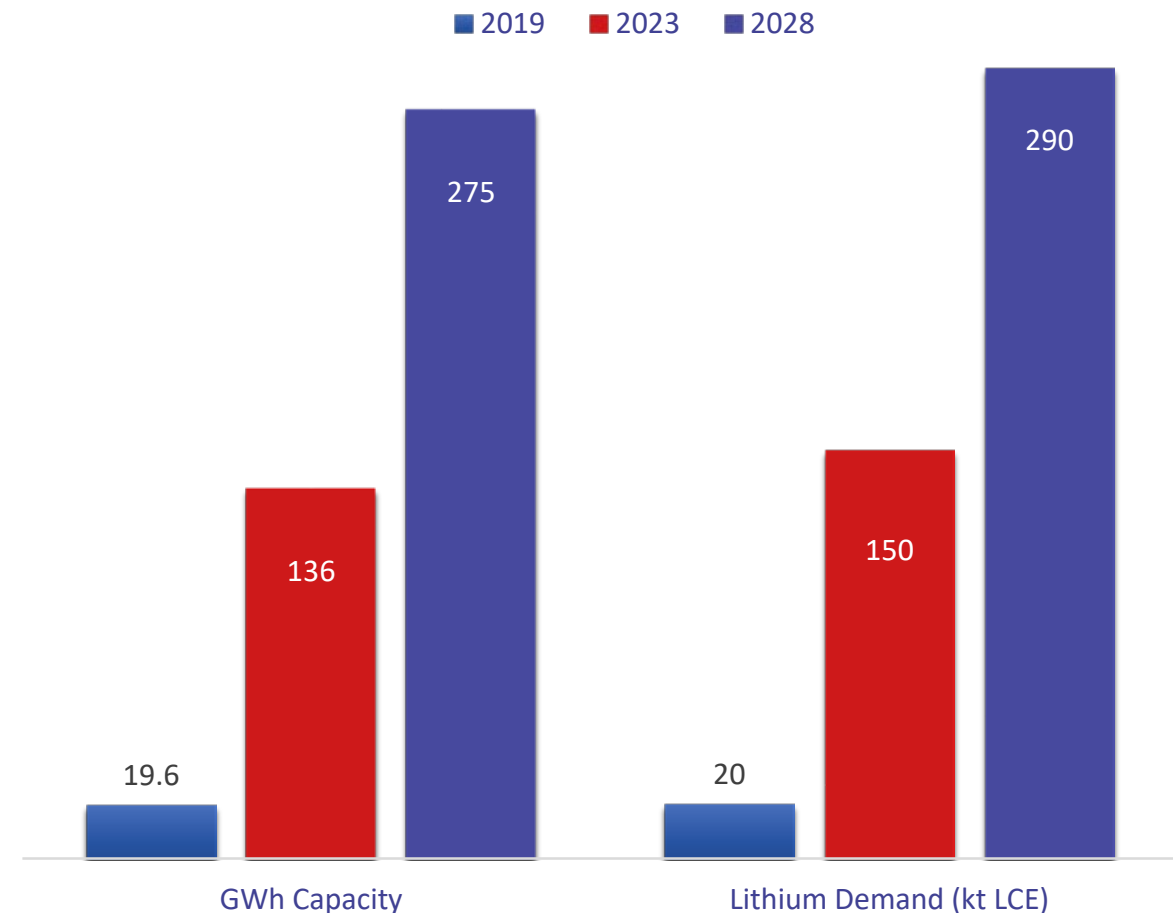


# Right Place, Right Product, Right Time



- EU pushing hard to have fully-integrated local lithium-ion battery supply chain, including lithium chemicals
- Unprecedented push from battery/cathode makers and OEMs to ramp up lithium-ion production
- 150kt LCE demand in Europe, just for battery production, by 2023, and **290kt by 2028**<sup>1</sup>
- Zero domestic production of battery-grade lithium in EU – only high C-footprint South American and Chinese lithium products available
- OEMs seeking zero carbon raw battery material supply chain<sup>1</sup>

### European Battery Production & Lithium Demand

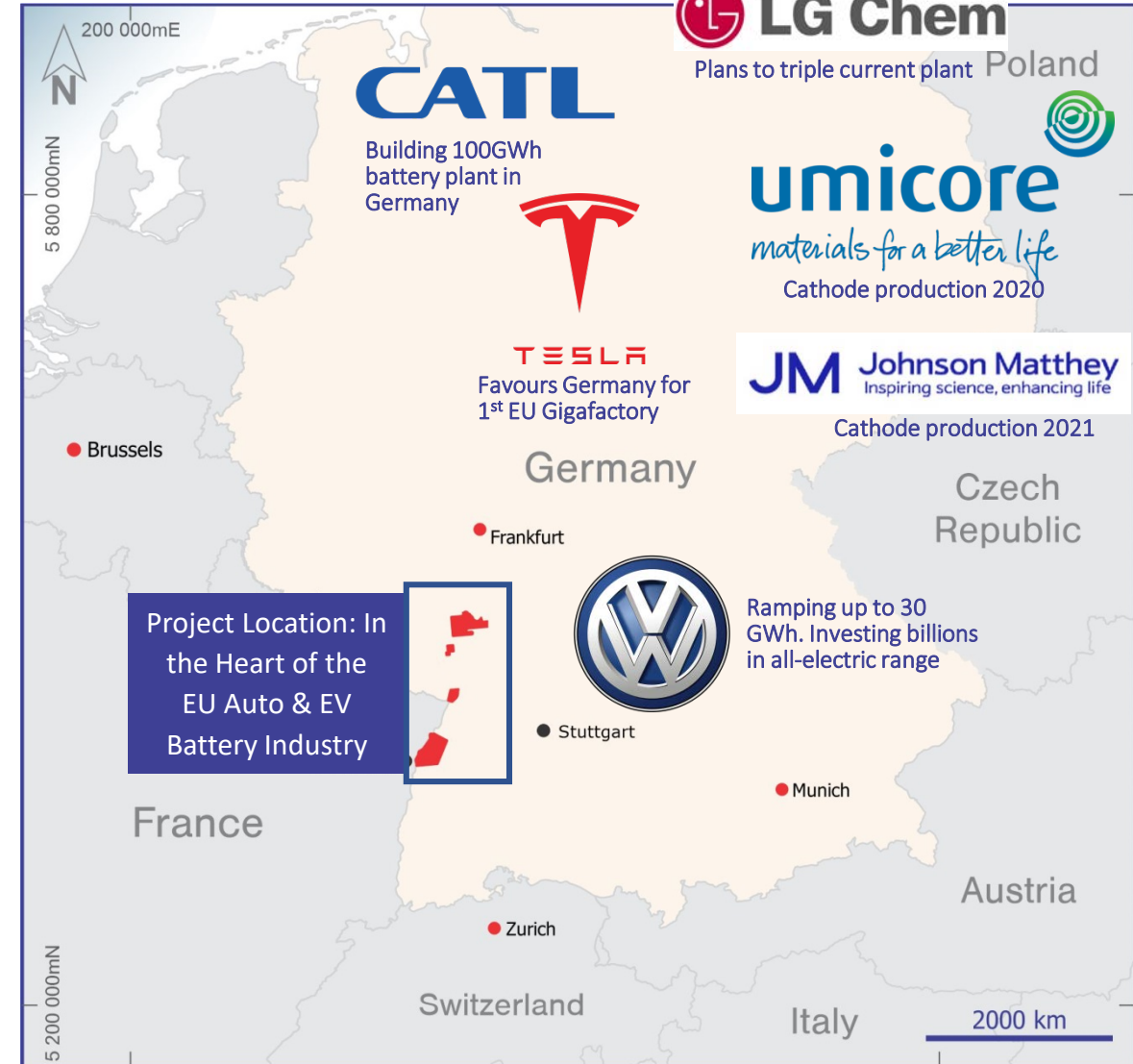


# Right Place, Right Product, Right Time

- Vulcan Lithium Project located in the heart of EU's battery and cathode "mega" and "giga" factories
- Within easy range of electric transport to battery and cathode factories: no carbon footprint
- Direct Lithium Extraction (DLE) to be used on heated brines to precipitate lithium hydroxide
- Renewable energy co-production to offset energy required for lithium production: **Zero Carbon Process**
- Large company precedent for similar project (Salton Sea); potentially high value opportunity
- Vulcan Lithium Project targeting 2023 production start-up of **Zero Carbon Lithium**



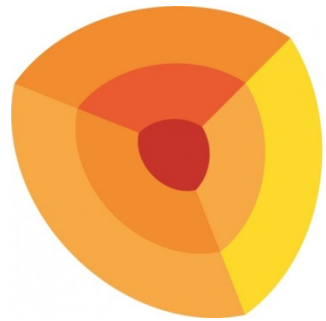
Plans to triple current plant Poland



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<sup>1</sup>refer ASX Announcement 10 July 2019

# In Good Company – Peer Comparison



Controlled  
Thermal  
Resources



Other **geothermal brine lithium** companies:

- Controlled Thermal Resources (CTR), (Salton Sea), advancing to lithium production with **US\$1.8B project**<sup>1</sup>, similar Li grades to Upper Rhine Valley (Vulcan) area
- CTR project previously held by Simbol (Salton Sea, California), which was reportedly **valued at US\$2.5B** and rejected **takeover offer of US\$325m** from Tesla<sup>1</sup>
- Berkshire Hathaway Energy, with \$91B in assets (Salton Sea), also seeking to produce battery-grade lithium<sup>1</sup>
- EuGeLi Consortium, including BASF, PSA Group (Peugeot-Citroen), EDF and Eramet (France) - recently secured funding for project in same URV field

***Strong Corporate Appeal. Financial Model & Processing Route Well-Tested by Peers.***

# VULCAN PROJECT: UNIQUE SELLING PROPOSITION



**SAMSUNG**



**LG Chem**

**BASF**

We create chemistry

**DAIMLER**

**GS YUASA**

**northvolt**

**JM Johnson Matthey**  
Inspiring science, enhancing life

**PSA**  
GROUPE

**CATL**

**SK innovation**

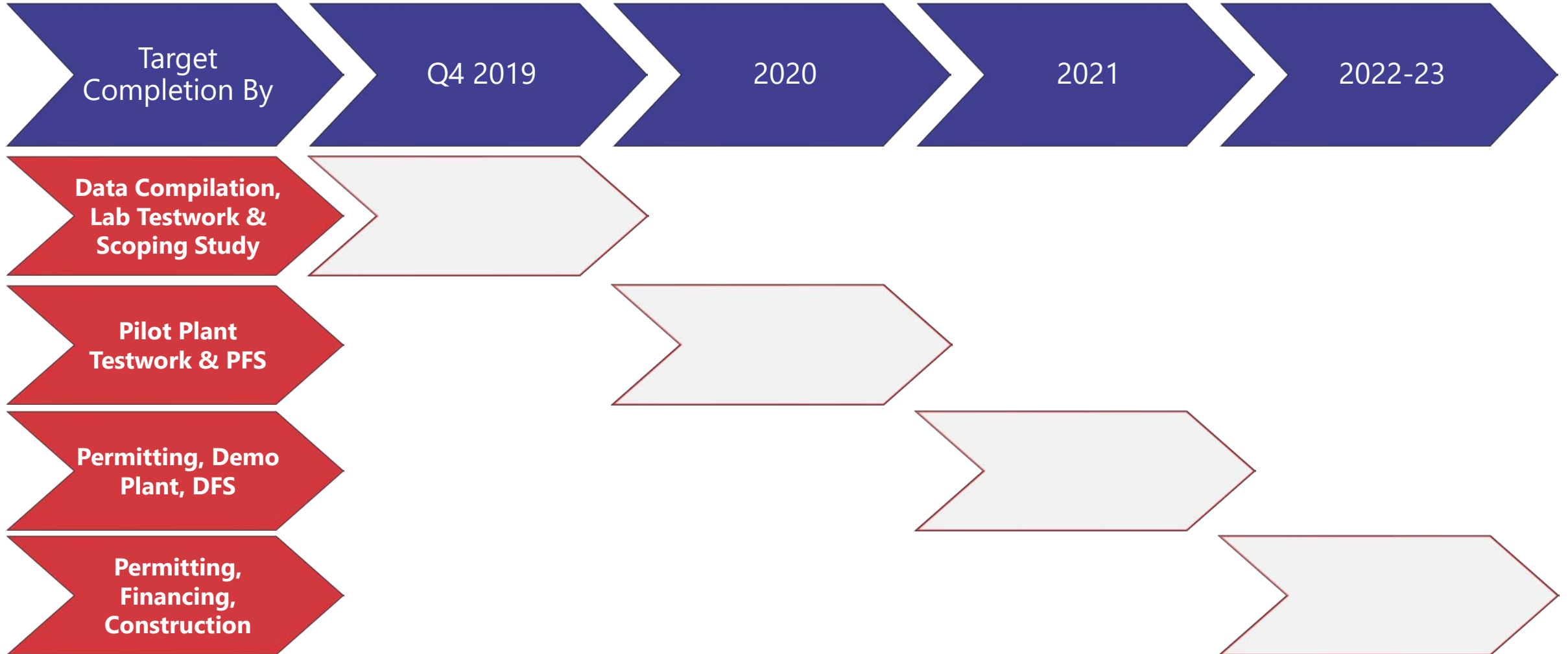
**umicore**  
materials for a better life

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- Potentially **only “zero carbon” lithium product** to be on the burgeoning EU market - ultimate selling point for EV-producing manufacturers, potential to charge a premium over other lithium sources
- **Strategic, secure** domestic supply for EU OEMs at a time of global trade insecurity, in a Chinese-controlled market
- **Quick processing time** using DLE means it can be responsive to market needs, unlike current salar production
- Potential for **additional credits** from renewable energy
- Lithium can potentially be recycled at end of useful battery life, providing fully circular economy, in line with EU aims
- Very short distance to market, unlike current sources of lithium

***Poised for an explosion of European lithium demand***

# Planned Project Timeline



***Poised for 2023 Lithium Demand Inflection Point in EU***



# Appendix 1: Information for Slide 9



Company	Code	Project	Stage	Resource Category	Resource Tonnes	Resource Grade (Li2O)	Contained LCE Tonnes	Information Source
European Metals	ASX: EMH	Cinovec	PFS Complete	Indicated & Inferred	695.9	0.42	7.17	Corporate Presentation Released 20 November 2018
Rio Tinto	ASX: RIO	Jadar	PFS Underway	Indicated & Inferred	135.7	1.86	6.24	Corporate Presentation Released 21 March 2018
Infinity Lithium	ASX: INF	San Jose	PFS Complete	Indicated & Inferred	111.3	0.61	1.68	ASX Announcement Released 22 August 2019
Savannah Resources	AIM: SAV	Barroso	DFS Underway	Measured, Indicated & Inferred	27.0	1.00	0.71	Corporate Presentation Released May 2019
European Lithium	ASX: EUR	Wolfsburg	PFS Complete	Measured, Indicated & Inferred	10.98	1.00%	0.27	Corporate Presentation Released 22 March 2019

# Appendix 2: Information Sources for Slide 10-11



- Elders, W., Cohen, L., (1983) *The Salton Sea Geothermal Field, California*, Technical Report. Institute of Geophysics and Planetary Physics, University of California
- GeORG (2013) Projektteam Geopotenziale des tieferen Untergrundes im Oberrheingraben Fachlich-Technischer Abschlussbericht des INTERREG-Projekts GeORG. Teil 2: Geologische Ergebnisse und Nutzungsmöglichkeiten
- Pauwels, H., Fouillac, C., Brach M. (1989) *Secondary production from geothermal fluids processes for Lithium recovery 2nd progress report*. Bureau de Recherches Geologiques et Minieres Service Geologique National
- Pauwels, H. and Fouillac, C. (1993) *Chemistry and isotopes of deep geothermal saline fluids in the Upper Rhine Graben: Origin of compounds and water-rock interactions*. *Geochimica et Cosmochimica Acta* Vol. 57, pp. 2737-2749
- Sanjuan, B., Millot, R., Innocent, C., Dezayes, C., Scheiber, J., Brach, M., (2016) *Major geochemical characteristics of geothermal brines from the Upper Rhine Graben granitic basement with constraints on temperature and circulation*. *Chemical Geology* 428 (2016) 27–47
- Mnzava, L., and Mayo, A. (2013). *Geochemical investigation of geothermal power potential exploration of hot springs in South western Tanzania*. *International Journal of Water Resources and Environmental Engineering* Vol. 5(10), pp. 597-607

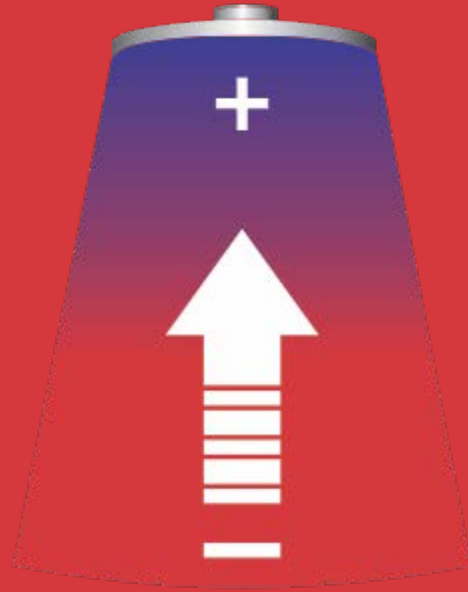
*The Competent Person is not aware of any new information or data that materially affects the information contained in the above sources or the data contained in this announcement*

# Appendix 3: Terms of Acquisition



- Koppar to acquire 100% of Vulcan Energy Resources Pty Ltd, holder of the Vulcan Project
- Shareholders are Dr Francis Wedin and Dr Horst Kreuter (refer overleaf)
- Initial Consideration 6,666,667 shares
- Milestone payments<sup>1</sup> to be made on:
  - completion of Scoping Study (4.4M Shares) **within 12 months**
  - completion of Pre-Feasibility Study (4.4M Shares) **within 24 months**
  - securing an offtake or downstream JV partner (4.4M Shares) **within 36 months**
- An additional 1M shares will be issued as an introduction / facilitation fee to parties involved in introducing the project to the Company
- Subject to shareholder approval a further 1.98 million shares may be issued to these parties on achievement of the above milestones<sup>1</sup>
- Subject to shareholder approval 750,000 shares and 3.75M performance rights will also be issued to Gavin Rezos and Viaticus Capital as terms of their appointment<sup>1</sup>

Current KRX Capital Structure	
Shares on Issue	39,083,335
Options (28.5c, exp Dec-20)	12,687,512
Performance Shares (vest at \$0.40, \$0.75, \$1.10 )	2,600,000
Market Cap @ 18.5c (undiluted)	\$7.2m
Enterprise Value @ 18.5c (undiluted)	~\$3.2M
Cash Position	~\$4M



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