ZINNWALD LITHIUM

# Focused on becoming an important supplier to Europe’s fast-growing battery sector

September 2022

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# OVERVIEW

AIM quoted resource company developing the 100% owned Zinnwald Lithium Project in Germany

## Attractive Project

Integrated project to produce battery-grade Lithium Hydroxide

PEA demonstrates pre- tax NPV of $1.6bn and IRR of 39%

Large resource - combined resource of >1m tons LCE

Potential resource upside from nearby exploration licences held

## Excellent Location

35km from Dresden, Germany

In the heart of the European chemical & automotive industries

Established mining district – mining history of over 400 years

Existing infrastructure & skilled labour in the region

## Strong Lithium Demand

Strengthening lithium market fundamentals supported by accelerating switch to EVs & strong government support, particularly in Europe

Lithium product prices have risen over 400% since the beginning of 2021

Lithium demand seen growing at a CAGR of 28% through 2025

## Team to Deliver

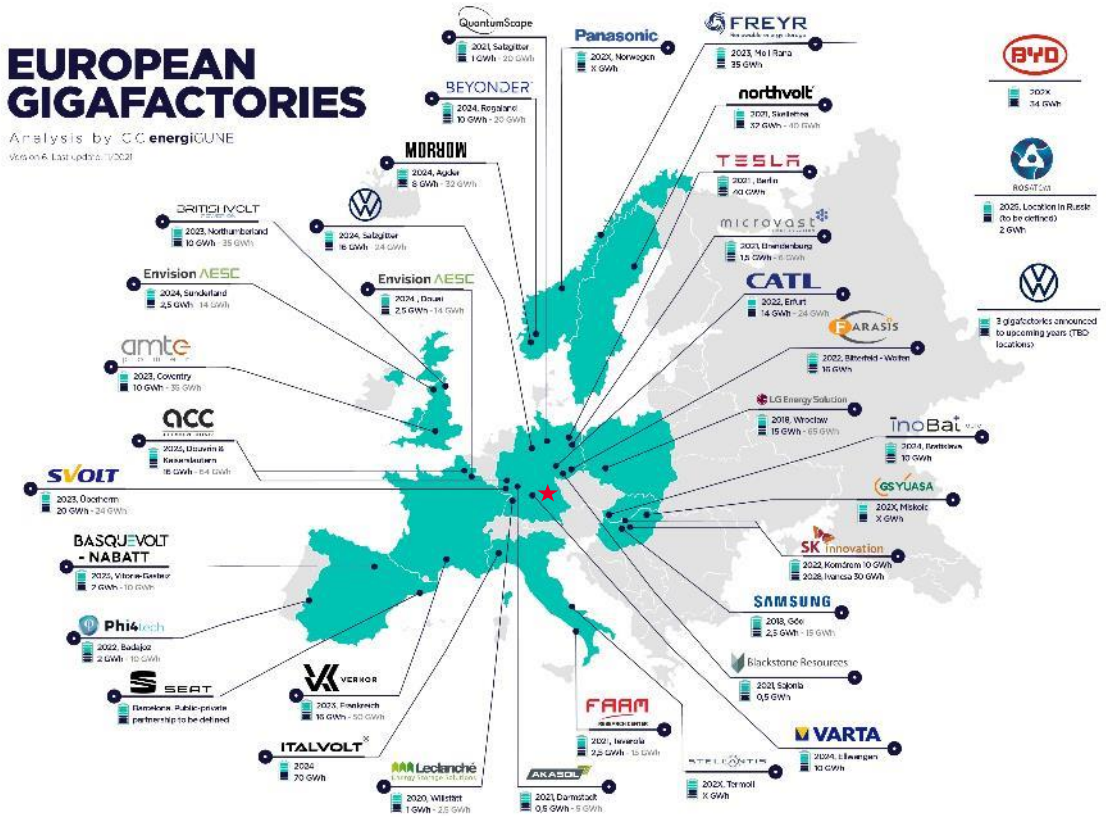
Experienced Board with relevant sector & financial skills to advance the Project

Strong team of chemists, geologists and engineers in Germany

# PROJECT HIGHLIGHTS

Potential to be a meaningful supplier of battery grade LiOH for the European market – 12ktpa

- Robust economics with pre-tax NPV8 of US$1.6 bn, IRR of 39% and payback period of 3.3 years
- Resource to support long life of >35 years
- Located close to end markets within the heart of the German car industry; security of supply for Europe
- Simple processing technology / flow sheet confirmed by extensive test work
- Possibility to utilise existing infrastructure in the region
- Saleable by-products with large markets including SOP (fertiliser) an PCC (paper industry)
- Potential to be a low or “zero waste” operation with possibility to find markets and applications for the bulk of its mined material
- Opportunity to bring industrial activity and jobs back to a region lon steeped in mining history

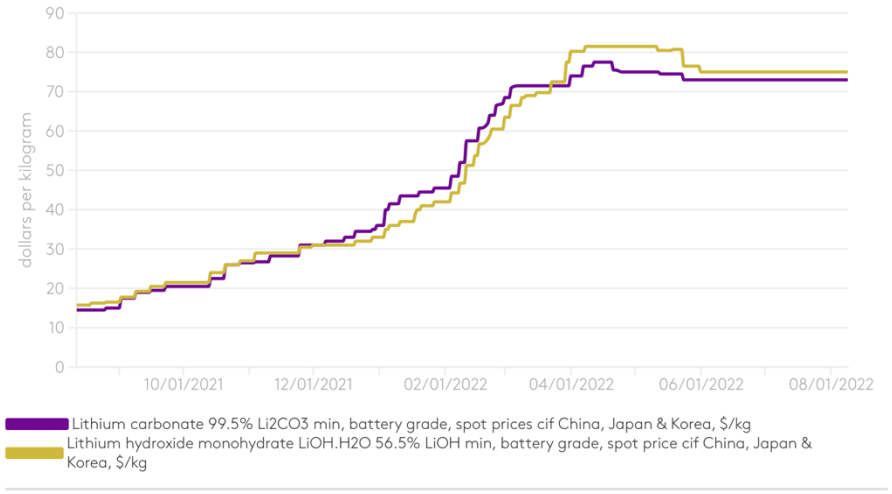



★ Zinnwald Project

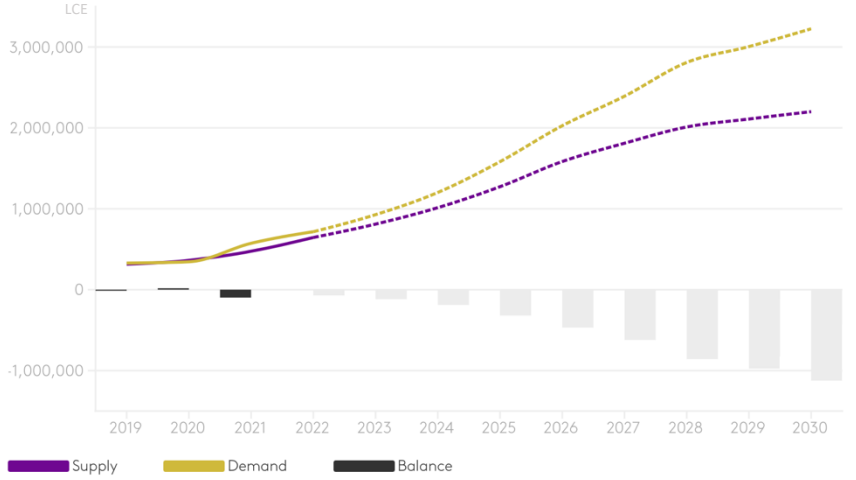
# LITHIUM MARKET DYNAMICS

- Lithium demand prospects of 3Mt by 2030 and by 5Mt by 2050 growing at an average of 28% p.a through 2025 (Bank of America)
- Demand growth driven by shift to EVs, which is occurring faster than anticipated
- Expected shortfall already in 2022; cumulative deficit increasing to ~1 M tonnes LCE by 2030 (Fastmarkets)
- The spot price of the lithium hydroxide rose over 400% between January 2021 and January 2022 (BMI)
- Demand for lithium hydroxide expected to grow strongly, especially in Europe, on the back of increased nickel-based battery chemistry applications; nickel-based batteries provide superior cold weather performance and energy density

**Lithium carbonate vs hydroxide prices August 2021 - 2022[1]**




**Lithium market balance[2]**






[1] Source Fastmarkets
[2] Source Fastmarkets, Q3 2022 and forward are projections

# LITHIUM IN EUROPE

Europe needs

## 18 x more lithium

in 2030 than it used in 2020 lifting to 60 x by 2050 to deliver on its comprehensive energy transition. Reuters

The mining industry needs to double capex to

## $160 billion by 2050

to meet the expected increased demand for metals used in the energy transition if decarbonisation and climate targets are to be met. BoA

Europe will need

## c. 200 GW

of electricity storage by 2030, and as much as 600 GW by 2050. EASE

There is an estimated

## 218% deficit

in lithium hydroxide processing that Europe is facing by the end of 2030. Rystad Energy

Europe is on track for

## 27 gigafactories

by 2030 to achieve a capacity of 789.2GWh, giving it a 14% market share of the global 5,454Gwh Li-ion battery production market. BMI

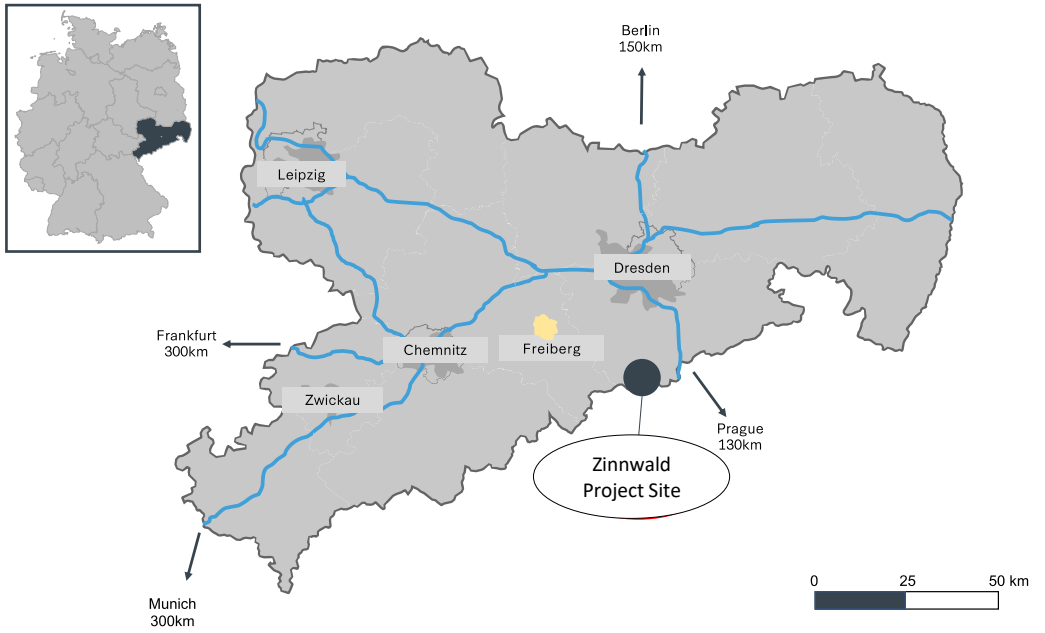
Europe plans to expand lithium battery-grade Li Carbonate production from nothing today

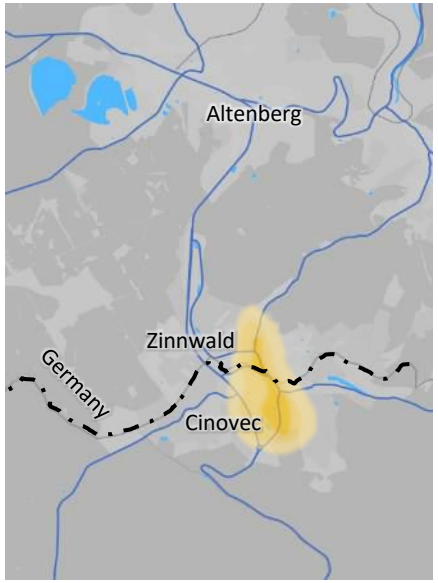
## to 8.3%

of global production by 2025 and has similar plans for lithium hydroxide, which is crucial for long-range EV batteries. Rystad Energy

# PROJECT OVERVIEW

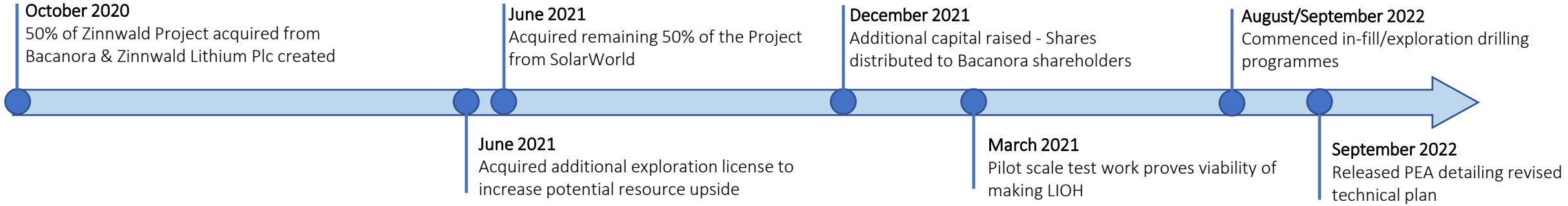
- Integrated operation planned to produce battery grade LiOH
- Small footprint underground mine & associated mineral & chemical processing
- Valuable by-products
  - High purity potassium sulphate and precipitated calcium carbonate
- Core mining licence valid until 2047
- Mine life of >35 years
- Regional exploration footprint
  - 3x other exploration licences within 15km of core mining licence
  - Combined resource of >1m tons LCE




# HISTORY & NEW TECHNICAL STRATEGY

Detailed technical review undertaken over the past 12 months to create a more viable and financeable project: saleable product, cost optimization, viable permitting plan, utilisation of existing infrastructure




| | Previous Concept | New Concept | Why |
|---|---|---|---|
| Product | Lithium Fluoride (LiF) | Lithium Hydroxide (LiOH) | LiF niche product with limited merchant market/few visible off-takers<br>LiOH in demand by European car makers |
| Scale | 5,100 tpa LiF | ~12,000 tpa LiOH from core Zinnwald license<br>Upside potential from satellite deposits | Greater scale required for relevance for investors and off-takers |
| Plant Location | Mineral processing on site, chemical processing at a remote industrial park | Mineral processing & chemical processing on-site | Minimising transport costs key to economic viability, existing infrastructure potentially available. Transport costs in original plan ~€12m/year (15% of total operating cost) |
| Carbon Footprint | Road transport (remote chemical site), uphill material flow | Downhill material flow, electric transport, proximity to tailings facility | $CO_2$ a major focus for off-takers and investors |

# REVISED MINING CONCEPT

## Opportunity to take advantage of existing infrastructure

- Existing ~4km drainage tunnel that potentially could be used to access Zinnwald deposit from below enabling downhill material flow
- Old shafts and underground workshops available (ventilation, escapeway, potential mineral processing underground)
- Larger scale mining (sub-level stoping) coupled with bulk ore-sorting techniques to enable larger lithium production
- Processing facilities to be located convenient to Access Tunnel portal

# LONG RESOURCE LIFE AND POTENTIAL UPSIDE FROM SATELLITE DEPOSITS

## ZINNWALD MINING LICENSE

- 35.5 MT M&I resource – supports >35 years of mine life
- Mining license to 2047
- One of the larger identified lithium resources in Europe

## THE FALKENHAIN EXPLORATION LICENCE

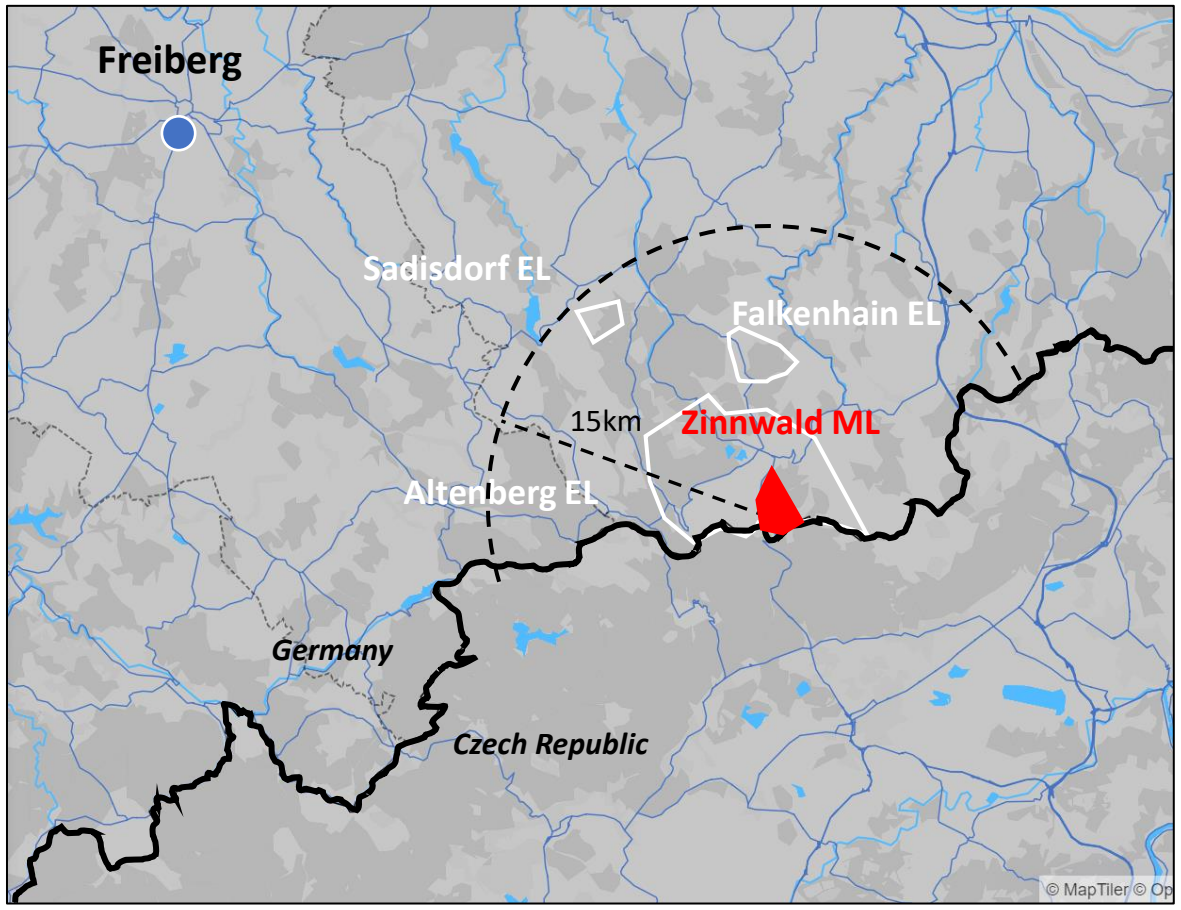
- Historical exploration data indicates resources hosted in several ore bodies containing lithium, tin metal and tungsten
- Exploration programme consisting of 10 diamond drill holes started to test historic drilling
- Analysis of old core and data suggests potential for high grade ore body

## THE SADISDORF EXPLORATION LICENCE

- 2017 historic JORC compliant inferred mineral resource of 25 Mt with an average grade of 0.45% $Li_2O$ (average 2,053 ppm Li)

## THE ALTENBERG LICENCE

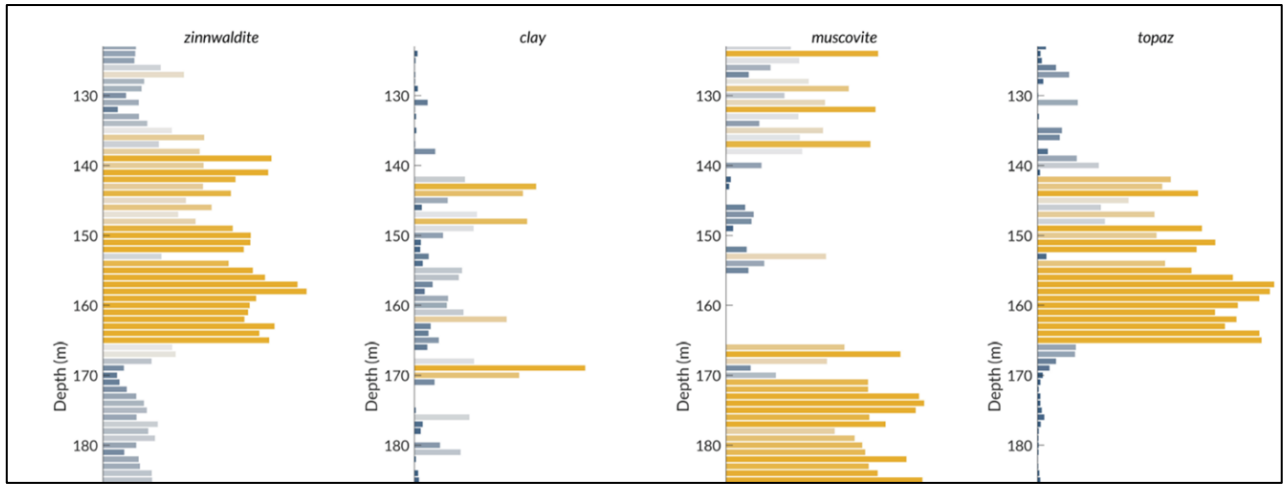
- Surrounds Zinnwald mining license – provides scope for resource extension



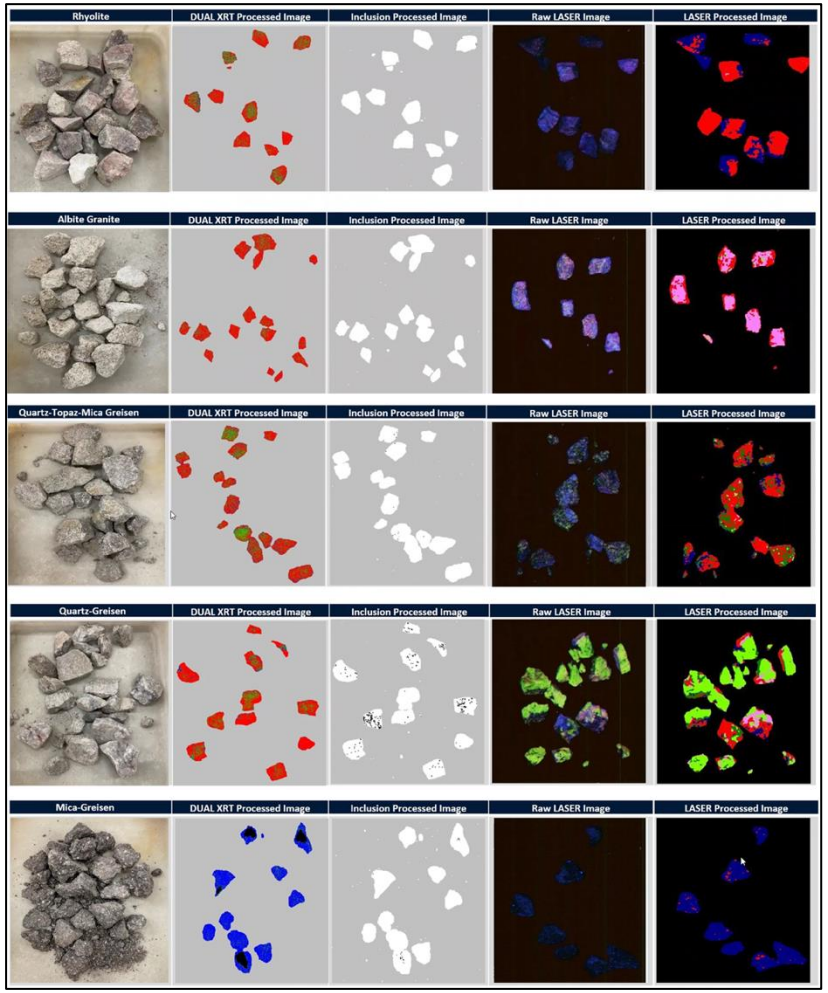
# SIGNIFIGANT UPSIDE POTENTIAL IN ZINNWALD DEPOSIT

## Pilot tests have proved ore-sorting viability

- Barren or low grade particles (>10 mm) can be effectively separated from material flow before expensive processing stages
- Ore-type 2 (excluded from Mineral Resources) and ore lenses below 2 metres in thickness (excluded from Mineral Reserves) may become economical
- Potential to materially increase Mineral Resources up to 200 Million tonnes and up to 100% increase in contained Lithium
- Carried out by Tomra and completed in late August. Not yet included in economic models



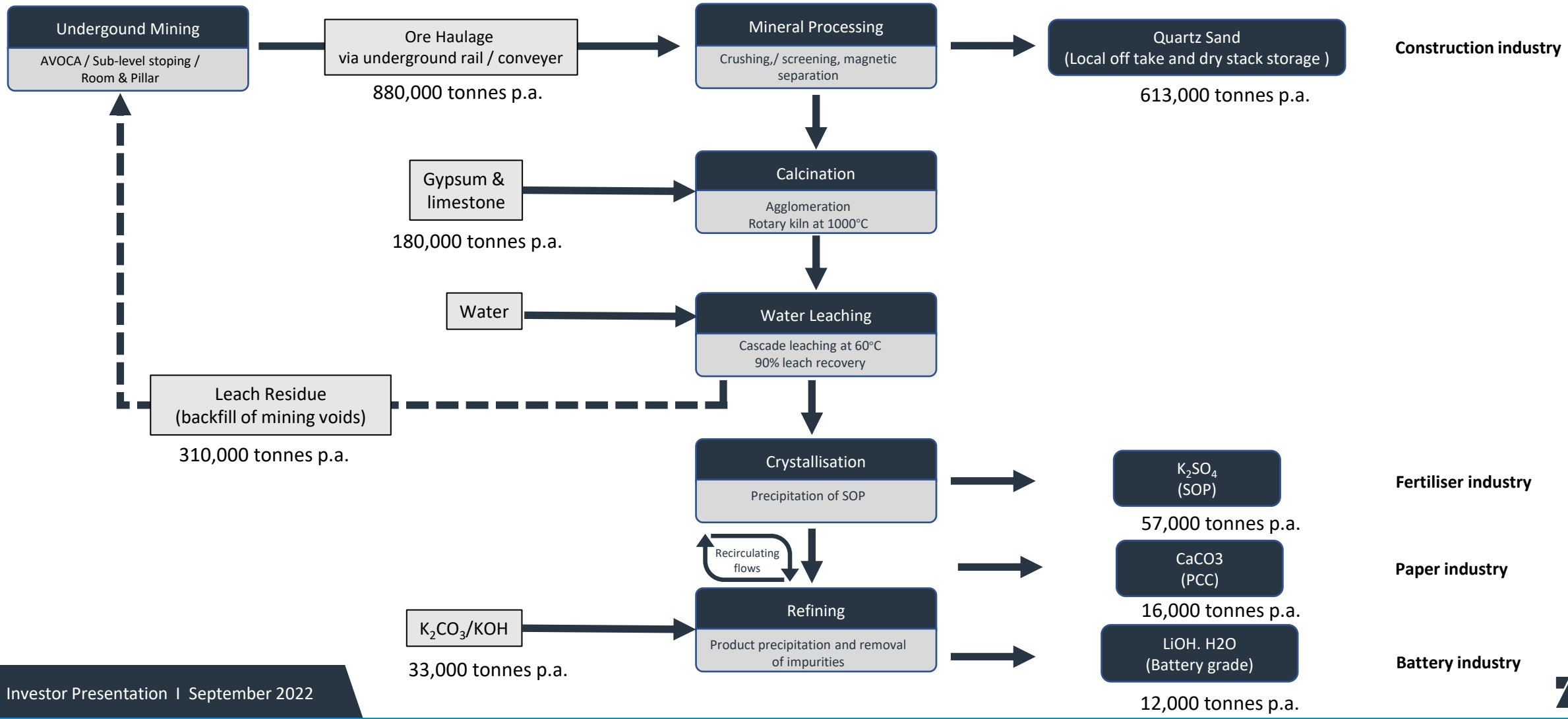

Hyperspectral Imaging 01/2022 by Theiax. Zinnwaldite (ore mineral) easily detectable in a sorting process.




Sorting viability test 04/2022 by Metso:Outotec/Tomra

# SIMPLIFIED FLOW SHEET

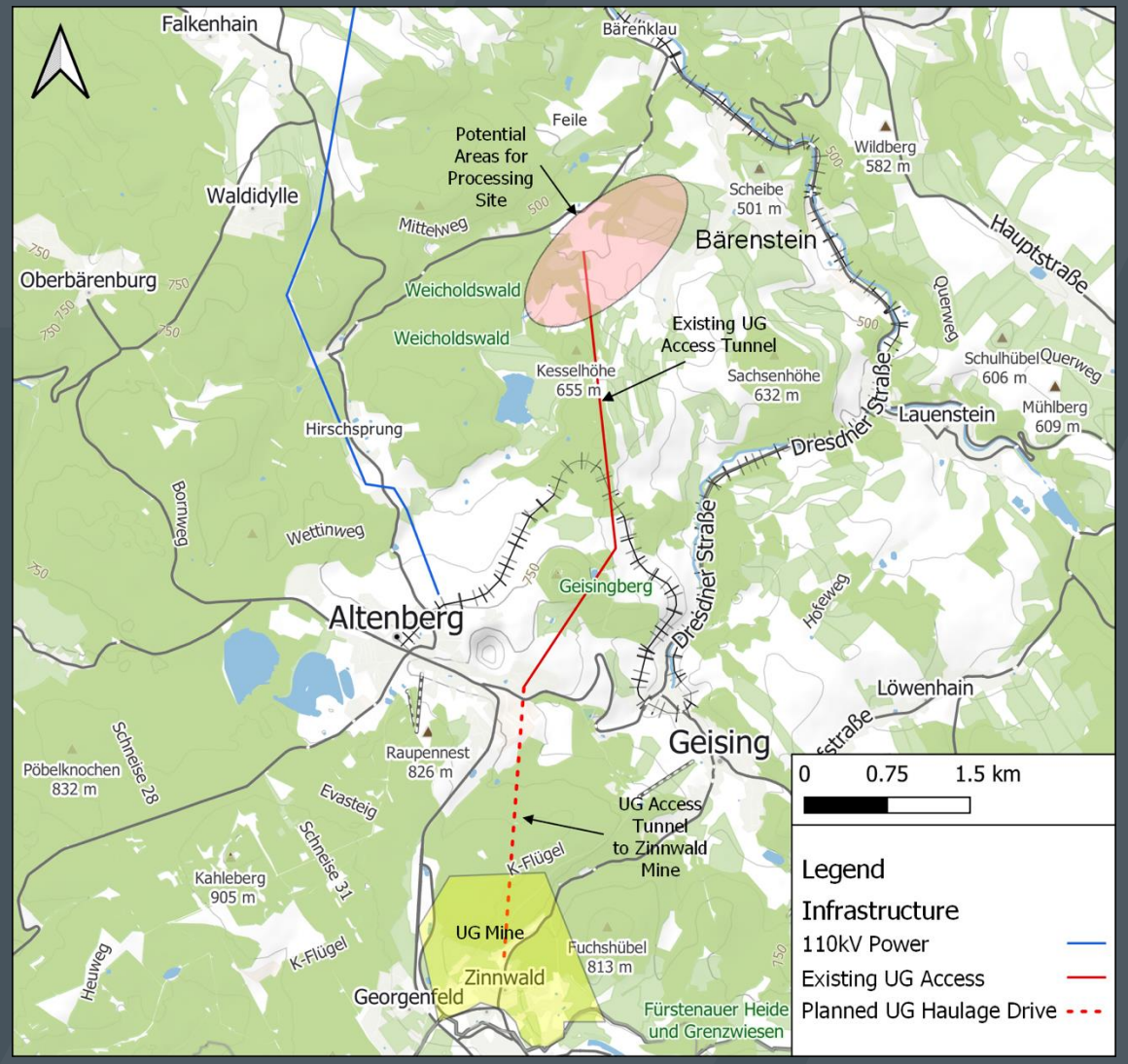
## Optimisation to minimise waste, transport and energy use



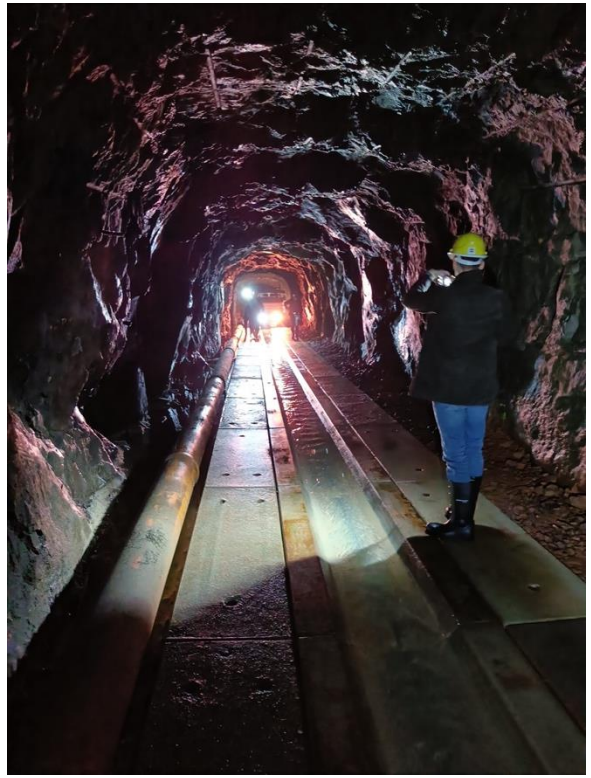
# LOCATION INFRASTRUCTURE ADVANTAGES

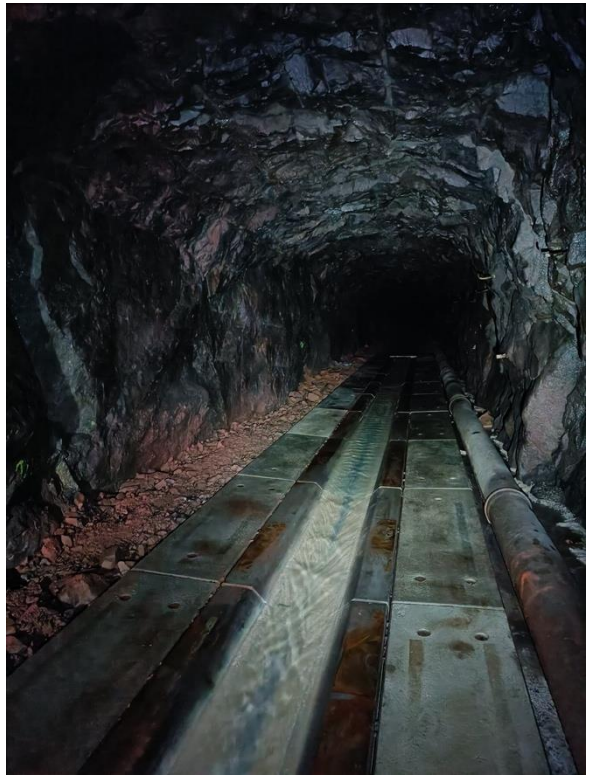
Historic mining activity has resulted in a legacy of brownfield infrastructure in the region

- Located in a region with a long history of mining
- Brownfield facilities in the area
- Legacy mining infrastructure with the potential to improve project logistics and lessen the impact on local communities and the environment
- Transport links, power & gas are readily available
- Site location options that facilitate exploitation of satellite deposits (Falkenhain & Sadisdorf) should these prove their potential



# EXISTING INFRASTRUCTURE

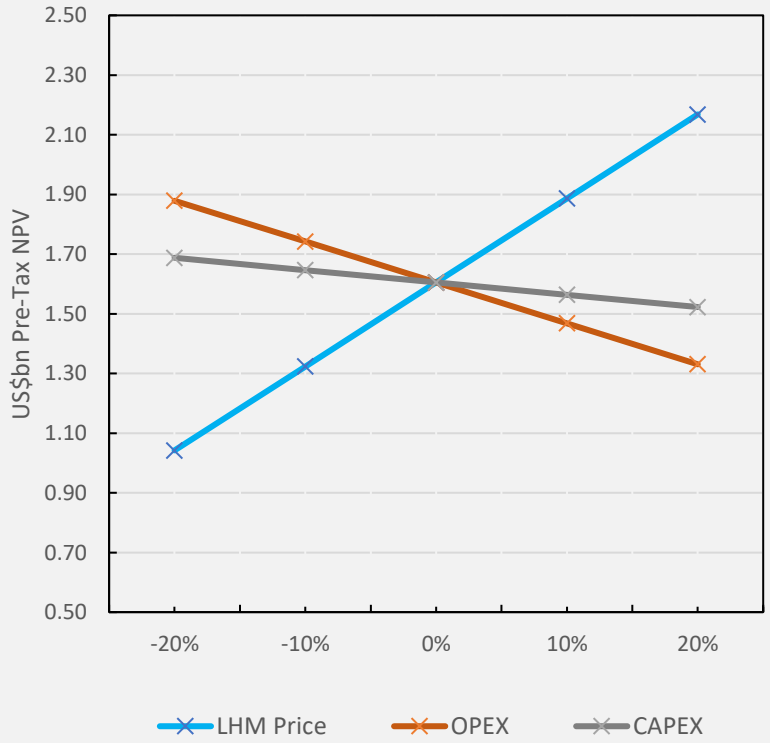




# PRELIMINARY ECONOMIC ASSESSMENT SUMMARY OF RESULTS(1)

| PEA Key Indicators | Unit | Value |
|---|---|---|
| Pre-tax NPV (at 8 % discount) | US$ m | 1,605 |
| Pre-tax IRR | % | 39.0% |
| Post-tax NPV (at 8 % discount) | US$ m | 1,012 |
| Post-tax IRR | % | 29.3% |
| Simple Payback (years) | Years | 3.3 |
| Initial Construction Capital Cost | US$ m | 336.5 |
| Average LOM Unit Operating Costs (pre by-product credits) | US$ per tonne LiOH | 10,872 |
| Average LOM Unit Operating Costs (post by-product credits) | US$ per tonne LiOH | 6,200 |
| Average LOM Revenue | US$ m | 320.7 |
| Average Annual EBITDA with by-products | US$ m | 192.0 |
| Annual Average LiOH Production | Tonnes per annum | 12,011 |
| LiOH Price assumed | US$ per tonne | $22,500 |
| Annual Average SOP Production | Tonnes per annum | 56,887 |
| Blended SOP Price assumed in model | € per tonne | 875 |

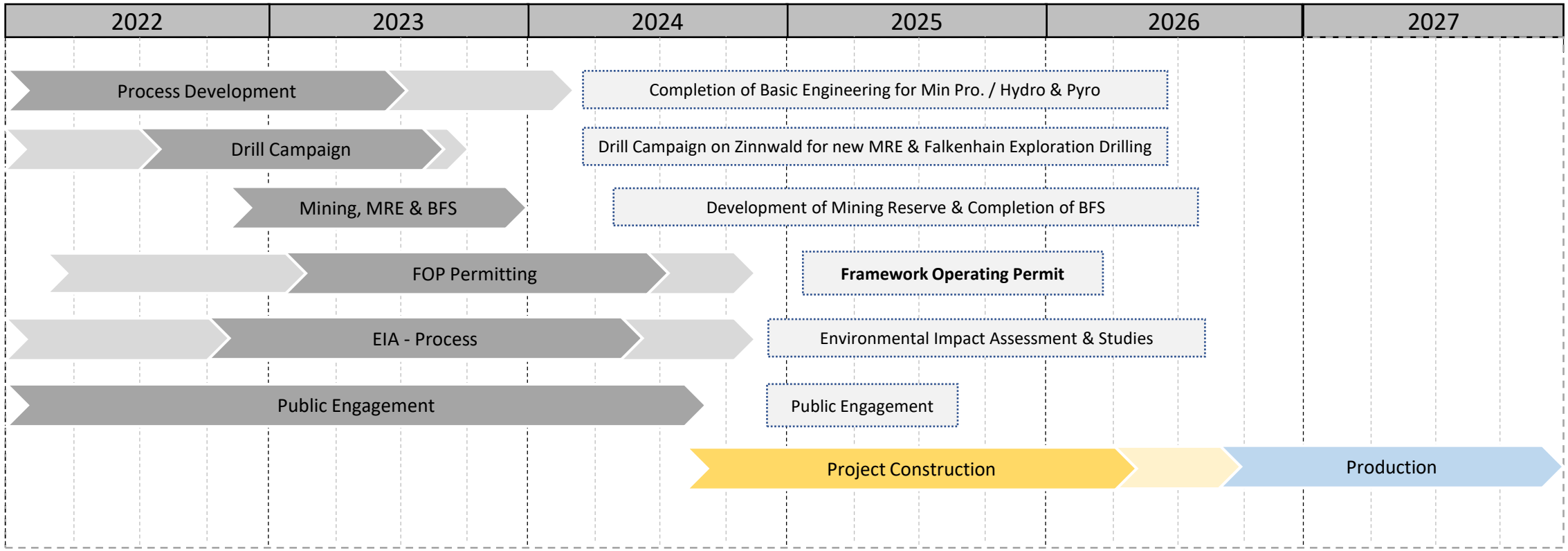
**Pre – Tax NPV8 (US$bn)**






[1] Source: PEA announced 7 September 2022

# PROJECT DEVELOPMENT TIMETABLE[1]






[1] This schedule of project development was developed for the PEA announced 7 September 2022, is a graphical snapshot of the driving summary activities and logic. The intent is to demonstrate major project execution activities and key milestones following completion of the PEA

# SUSTAINABILITY ADVANTAGES

| | ZINNWALD | SOUTH AMERICAN BRINE | AUSTRALIAN HARD ROCK | GEOTHERMAL BRINE/DLE |
|---|---|---|---|---|
| Proximity to end market (TRANSPORT COST & $CO_2$ EMISSIONS) | ✓ | ✗ | ✗ | ✓ |
| Physical footprint | ✓ | ✗ | ✗ | ✓ |
| Water intensity | ✓ | ✗ | ✓ | ✗ |
| Energy intensity | ✓ | ✓ | ✗ | ✗ |
| Conventional technology | ✓ | ✓ | ✓ | ✗ |

## TRANSPORT MINIMISED

- Located close to final end markets
- Integrated production planned - mining to battery grade products

## LIMITED PHYSICAL IMPACT

- Small footprint underground mining operation
- Dry stack benign tailings (quartz sand/filler sand)

## LIMITED WATER USAGE

- Dry magnetic separation process and non water intensive process

## RELATIVELY ENERGY EFFICIENT PROCESS

- Zinnwaldite requires less energy than spodumene to process into battery grade product

# ESG

Being environmentally & socially responsible & upholding high standards of governance is core to Zinnwald Lithium's mission

## Environmental

Lithium-ion batteries are a key enabling technology for the shift to a greener economy

Zinnwald Project is an integrated project located close to end markets thereby minimising transport & associated emissions

Small footprint underground mine limits physical impact of the operation

Dry stack benign tailings

Germany produces >50% of its power from renewable & low carbon sources

## Social

Established mining district – mining history of over 400 years

Access to brownfield infrastructure & skilled labour

Zinnwald Project is expected to generate over 180 long term direct jobs in the region

Zinnwald Project will act as a major income generator for the state & local regions

## Governance

UK listed Plc with a commitment & obligation to maintain the highest levels of transparency & corporate governance standards

Adheres to the QCA Corporate Governance Code

Board level Sustainability Committee to ensure best practice re ESG obligations

Established the Group's core Sustainability philosophy & refining & expanding on existing ESG policies

# STRATEGY & FOCUS AREAS

- Strategy to become a low-cost supplier of battery grade LiOH to the European battery sector through:
  - Increasing production potential from core Zinnwald license area & satellite deposits
  - Optimising cost position and reducing the overall CO2 footprint through value engineering
  - Maximising revenue potential from by-products (SOP and PCC, tin and tungsten potential)

- Focus areas in the near term:
  - Advance bankable feasibility study by end of 2023
  - Infill drilling to refine mine planning
  - Advance work on exploration licenses to evaluate potential and impact on the Project, including drilling to test historic work
  - Value engineering, project optimisation and site selection
  - Negotiate access to legacy infrastructure
  - Advance funding strategy for next stage of development, including drilling

# INVESTMENT SUMMARY

Integrated lithium project with attractive project economics & mining licence in place

Project in the heart of Europe’s chemical & automotive industries, benefiting from historic mining activity & brownfield infrastructure

Meaningful resource position & expansion potential from additional exploration licences held in the area

Optimising plan focused on advancing Zinnwald towards construction & operation of a mine & processing plant

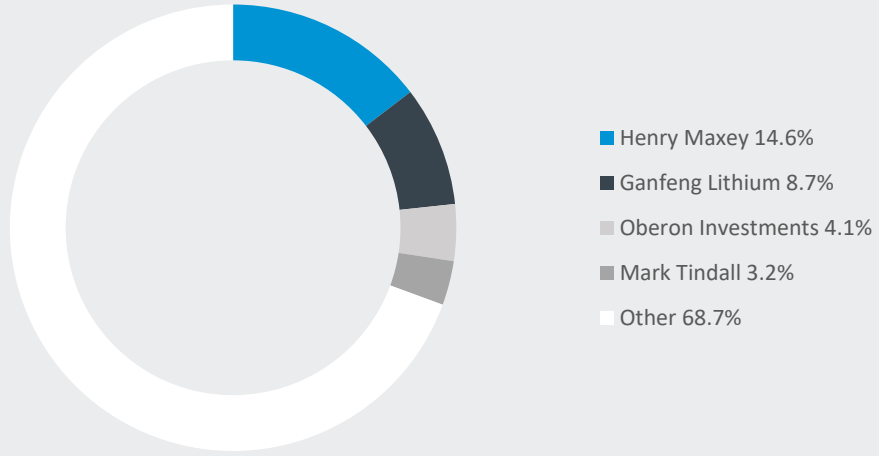
Strong market fundamentals with growth forecast for lithium hydroxide demand, particularly with EU focused on encouraging local supply

Experienced leadership & management team to deliver

# APPENDIX – KEY DATA (as at 12.09.22)

| Ticker | Market | Market cap | Share price | Shares in issue | Nomad | Broker |
|---|---|---|---|---|---|---|
| ZNWD | AIM | £32m | 10.8p | 293,395,464 | Allenby Capital | Oberon Capital |

## Key Shareholders




## Share Price Graph

# APPENDIX - BOARD

## Jeremy Martin

Non-Executive Chairman

+20 years experience working in South America, Central America & Europe, where he was responsible for grassroots regional metalliferous exploration programmes through to resources definition and mine development.

He is currently CEO of Horizonte Minerals and a member of the Society of Economic Geologists and the Institute of Mining Analysts. He holds BSc (Hons), MSc, ACSM, MSEG. Horizonte Minerals is currently developing a major nickel project in Brazil.

## Anton Du Plessis

Chief Executive Officer

+20 years' experience in the finance sector where he held senior positions at several international investment banks including CIBC, Bank of America Merrill Lynch and Morgan Stanley with a focus on advising natural resources companies on the execution of strategic and financing transactions. He was previously Non-Executive Chairman of Erris Resources Plc.

## Cherif Rifaat

Chief Financial Officer

UK Chartered Account with +20 years of VC,, Corp. Finance, Op Turnaround and IR experience. He has worked cross sectors with an emphasis on start up, pre IPO or restructuring phase.. He has been a corporate adviser to Bacanora since 2014 before it made its original IPO on AIM and is now its Co. Secretary. His role at Bacanora included preparing the Financial Models for the PFS & BFS for the Sonora Project. Was also involved in the financial modelling for the Zinnwald BFS.

## Peter Secker

Non-Executive Officer

A mining engineer with +35 years experience in the resources industry. During his career he has built and operated several mines & metallurgical processing facilities in Africa, Australia, China & Canada. His operating & project experience spans a number of commodities, including titanium, copper, iron ore, gold & lithium.

For the past 15 years Peter has been Chief Executive of a number of publicly listed companies in Canada, UK & Australia. He is currently CEO of Bacanora Lithium.

## Graham Brown

Non-Executive Director

An economic geologist with over 40 years' experience in the mining and exploration industry, having led teams that discovered numerous world class ore deposits. Previously the Group Head of Geosciences & Exploration at Anglo American, where he was responsible for the governance, oversight and assurance of all aspects of geosciences and exploration activities. He is currently a Senior Advisor to Appian Capital Advisory LLP a private equity fund focused on the mining industry.

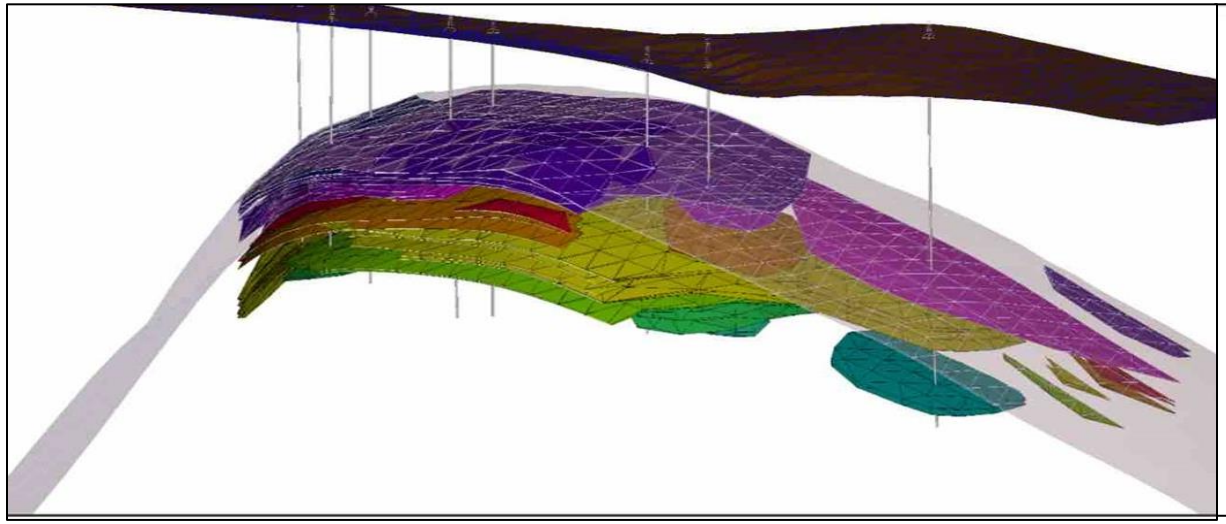
# ZINNWALD RESOURCES & RESOURCE

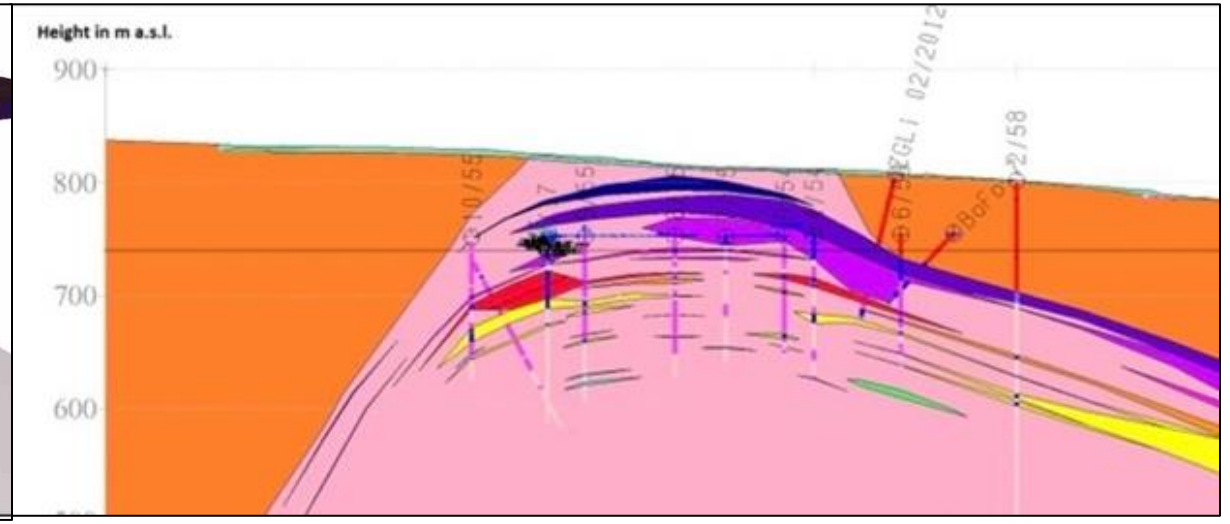
## ZINNWALD LITHIUM DEPOSIT

- 256.5 ha and with a 30-year mining licence to 31 December 2047
- Measured plus Indicated Mineral Resource estimate containing 35.51 Mt at a grade of 0.76% $Li_2O$ (3,519 ppm Li) containing 124,974 tonnes Li at cut-off grade of 0.54% $Li_2O$ (2,500 ppm Li)
- Represents c.665,000 tonnes of LCE, comprising c.357,500 tonnes of LCE in Measured Resources & c.307,500 tonnes of LCE in Indicated Resources
- Estimated Inferred Mineral Resources of 4.87 Mt at a grade of 0.76% $Li_2O$ (3,549 ppm Li) containing 17,266 tonnes Li metal (approximately 92,000 tonnes LCE)

## MINERAL RESOURCE ESTIMATE OF THE ZINNWALD LITHIUM DEPOSIT

| Resource classification* | Ore tonnage (000t) | Mean $Li_2O$ grade (%) | Contained LCE (tonnes) |
|---|---|---|---|
| Measured | 18,510 | 0.78% | 357,659 |
| Indicated | 17,000 | 0.73% | 307,579 |
| Inferred | 4,865 | 0.76% | 91,906 |
| Total (Measured + Indicated) | 35,510 | 0.76% | 665,238 |
| Total Inferred | 4,865 | 0.76% | 91,906 |



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