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Developing the next lithium producer in the heart of Europe

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AIM quoted junior resource company focused on becoming an important supplier to Europe's fast-growing battery sector

50% interest in the Zinnwald Lithium Project, a late stage development project in Germany with attractive economics and a mining licence in place

- Feasibility Study, June 2019: €428m pre-tax NPV (8% discount rate); pre-tax IRR 27.4%; 46% EBITDA margin
- · Located in the heart of Europe's chemical and automotive industries
- · Potential to be one of Europe's most advanced battery-grade lithium projects



Defined development plan focused on advancing Zinnwald towards construction & operation of the mine & processing plant



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



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

<sup>1</sup> The holding in Zinnwald Lithium Project is held via Deutsche Lithium GmbH



Advanced lithium project in the heart of Europe

## Project Concept



- Integrated project designed to produce a suite of value-added downstream battery-grade lithium products
- Mine life of 30 years equates to < 50% of the current identified mineral resources
- Project NPV (100%): €428m and IRR: 27%
- Construction Capex of €159m



- Definitive Feasibility Study completed
- Approved mining licence valid to 2047 and permitting process advanced
- Experienced project management team based in Germany
- Skilled labour available

## Excellent Location



- 35km from Dresden, Germany
- In the heart of the European chemical & automotive industries
- Established mining district mining history of over 400 years
- Access to infrastructure (power, roads)





## Lithium Demand

### **Rapid Growth Forecast**

Six-fold increase in demand for lithium expected by 2030 as EV adoption increases & battery sector expands<sup>1</sup>

The incremental growth in lithium demand represents ~20 new lithium mines with an average size 25ktpa to 2025<sup>1,2</sup>



 $^{\rm 1}$  Per Signumbox forecasts as detailed in 43-101 report dated September 2020  $^{\rm 2}$  from 2018

Smart Phone

3g

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Europe is investing in a competitive and sustainable battery manufacturing sector. We want to provide a framework that includes secure access to raw materials, support for technological innovation and consistent rules on battery production. We envisage a strong battery industry that contributes to the circular economy and clean mobility.

**Commissioner Elżbieta Bieńkowska** European Commissioner for Internal Market, Industry, Entrepreneurship and SMEs The EU has added lithium to a list of critical materials that it plans to support locally

Several EU countries have announced the phasing out of fossil fuel vehicle sales Germany allocating €40b for climate related stimulus spending including 70,000 new EV charging stations and doubling the EV subsidy to €6,000 targeting annual production of 7 to 10 million EVs by 2030 France spending \$8b on EV subsidies

BMW to have 20 new EV models in next 10 years

At least 16 new lithium battery Gigafactories planned in Europe over next 10 years with European lithium battery capacity estimated to increase by over 300 to 400 GWh from current levels

Plug-in cars were 12.4% of all car sales in EU in 2020 and the EU was the single biggest market for EVs in 2020 Volkswagen spending **\$60b** on its EV metamorphosis over next decade



**Overall, total battery** capacity in stationary applications could increase from a current estimate of 11 GWh to between 180 to 420 GWh, an increase of 17- to 38-fold.

International Renewable Energy Agency

## European Battery/Downstream Lithium Sector

Benchmark Mineral Intelligence (BMI), a London-based price reporting agency, predicts that by 2030 there will be at least 16 plants operating across the continent with a total annual production capacity of 446 GWh...

...Germany leads the way for the future of European battery production capacity, with plans to reach more than 200 GWh by the end of the decade; almost half of the continent's proposed total.



## The Zinnwald Lithium Project



## Zinnwald Project Overview

- Located in the heart of German automotive and chemical industries
- Area historically mined for tin, tungsten and lithium over the past 400 years
- DFS with attractive economics announced in June 2019
- Approved mining license valid until 2047 and permitting process advanced
- Experienced team on the ground in Germany







ANNUAL PRODUCTION LITHIUM	7,285 t.p.a. LCE <sup>2</sup>
ANNUAL PRODUCTION K <sub>2</sub> SO <sub>4</sub>	32,000 t.p.a.
PROJECT LIFE	30 years
TOTAL RESOURCE	757,145 tons LCE (665,238 M&I)
CONSTRUCTION CAPITAL COSTS	€159 million <sup>3</sup>
CONSTRUCTION PERIOD	<24 months
NET PRESENT VALUE (PRE-TAX)	€428 million (@8%)
AVERAGE LOM ANNUAL EBITDA ESTIMATE	€58.5 million per annum
BASE CASE 30YR REVENUE AND PRE-TAX CASHFLOW	€3.86 billion and €1.56 billion respectively
IRR (PRE-TAX)	27.4%

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<sup>1</sup> Figures shown for 100% of the Project per the DFS dated May 2019
<sup>2</sup> Whilst the DFS is based solely on the production of lithium fluoride, DL has established the possibility to produce battery-grade lithium carbonate directly from the lithium mica concentrate with only minimal modifications to the chemical plant circuits. The same applies to a possible LiOH-H2O production.

<sup>3</sup> In order to produce Li<sub>2</sub>CO<sub>3</sub> additional capex of €2 million is estimated

### Zinnwald is one of the more advanced lithium projects in Europe

Selected European Lithium Companies <sup>(1,2,3)</sup>								
Company	Market Cap (£m)		Listing	Project	Location	Stage	Resource (Mt)	Resource Grade (Li20%)
Zinnwald Lithium	30		AIM	Zinnwald	Germany	DFS	40.4	0.76
European Metals Holdings		103	AIM & ASX	Cinovec	Czech. Rep.	PFS	695.9	0.42
Savannah Resources	63		AIM	Mina de Barroso	Portugal	PFS	27	1.06
Infinity Lithium	33		ASX	San Jose	Spain	PFS	111.3	0.61
European Lithium	25		ASX	Wolfsberg	Austria	PFS	11	1
Keliber	NA		Unlisted	Several	Finland	DFS	14.2	1.08

<sup>1</sup> Excludes brine projects, exploration projects and multi commodity projects (Jadar)

<sup>2</sup> Source: Company websites

<sup>3</sup> Market cap as at 28 January 2021

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## 2021 Objectives



Advance permit applications for mining and mineral processing







Initiate front end engineering design work



Finalise site selection for chemical processing plant



Advance discussions with potential off-takers



Advance funding strategy for next stage of development



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Advanced Lithium project with attractive project economics and mining licence in place Feasibility Study, June 2019: €428m pre-tax NPV (8% discount rate); pre-tax IRR 27.4%; 46% EBITDA margin



Project located in the heart of Europe's chemical and automotive industries



Defined development plan focused on advancing Zinnwald towards construction and operation of the mine and processing plant



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



Experienced leadership and management team to deliver



## Appendix

Ticker	Market	Market cap	Share price	Shares in issue	Nomad	Broker
ZNWD	AIM	£26.66m	13p	205,105,957	Allenby Capital	Turner Pope Investments

**KEY SHAREHOLDERS** 

■Bacanora Lithium plc - 44.2%

Henry Maxey - 14.6%

David Hall - 3.4%

Osisko Gold Royalties - 2.9%

■Other - 34.9%

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**SHARE PRICE GRAPH** 

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## Mine Concept





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35.5Mt ore averaging 3,500ppm Li



## M+I Resource of **125k.t** Li (665k.t. LCE)



Resource classification*	Ore tonnage (000t)	Mean Li grade (ppm)	Contained LCE (tonnes)
Measured	18,510	3,630	357,659
Indicated	17,000	3,399	307,579
Inferred	4,865	3,549	91,906
Total (Measured + Indicated)	35,510	3,519	665,238
Total Inferred	4,865	3,549	91,906

Ore bed	Volume (Million m³)	Tonnage (Million tonnes)	Mean Li grade (ppm)	Max. vertical thickness (metres)	% of Ore
В	6.23	16.8	3472	40.6	47.4
С	0.54	1.5	3723	16.3	4.1
D	1.05	2.8	3599	17.4	8.0
E	3.11	8.4	3568	40.0	23.6
J	0.52	1.4	3872	23.1	4.0



## **Processing Concept**



 Conventional flow sheet uses established sulphate route processing technology 

- Flexibility to produce multiple lithium products<sup>1</sup>
- Potassium sulphate to be produced as a by-product to supply the European fertilizer industry

### Pilot plant operated by K-UTEC in Sondershausen, Germany



Total view Lithium pilot plant (Li-Pia) with evaporator and crystallisator <sup>1</sup> Ability to produce lithium carbonate demonstrated and production of lithium hydroxide to be tested



## 2011-17

- SolarWorld acquired two exploration licenses in the Zinnwald area
- Exploration drilling confirms potential lithium resource
- Drilling campaigns further delineate resource
- PERC Pre-feasibility study

## 2017

- Mining Licence Received
- Bacanora acquires 50% interest in the Project

## 2018-19

- 43-101 Resource & Reserve report published
- DFS published



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## **Board of Directors**



JEREMY MARTIN Non-Executive Chairman

+20 years experience working in South America, Central America & Europe, where he was responsible grassroots regional for 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 positions at several senior international investment banks including CIBC, Bank of America Merrill Lynch and Morgan Stanley with a focus on advising natural resources companies on the of strategic execution and financing transactions. Prior to the transaction he was Non-Executive Chairman of Erris Resources Plc



PETER SECKER Non-Executive Director

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.



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.



GRAHAM BROWN Non-Executive Director

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

### Deutsche Lithium Project Team



PROF. DR. ARMIN MUELLER

#### Managing Director

Chemist with over 30 years' experience in the chemical industry, inorganic especially and semiconductor chemistry. For the past 9 years he has been CEO of Deutsche Lithium GmbH, and developed the Zinnwald Lithium project. Armin has a honorary professorship in inorganic technical chemistry at Technical University Mining Academy Freiberg.



### DR TORSTEN BACHMANN

Chemist

Environmental Dipl.-Ina. of Technology (University Mittweida) and has a PhD in Chemistry (Technical University of Dresden). He has over 15 years' experience in science and industry in the area of photovoltaics inorganic and chemistry and experience in managing national research projects as well as department manager in technology companies. He was team leader in the "Lithium Zinnwald Project" from 2011 to 2015 and is the project leader of the working package "Chemical Processing" since 2017.



### JAN HENKER

in

### **Process Engineer**

to 2015 and since 2017.



**DR THOMAS** DITTRICH Geologist

Dipl.-Ing. of Process Engineering Graduated from Technical University (Graduate of Technical University Bergakademie Freiberg in geology/ Bergakademie Freiberg / Germany). palaeontology in 2009. Between He has 15 years industry experience 2009 and 2017, he was a Scientific mechanical Research Assistant at Technical the sectors photovoltaics and University of Freiberg, where he processing. inorganic chemistry and over five worked in the fields of assessment vears of experience in managing of rare metal deposits (e. g. gallium) plant engineering and construction. and development of exploration He is project leader of the working strategies for pollucite bearing rare package "Beneficiation" in the metal pegmatites (caesium lithium, "Lithium Zinnwald Project" from 2012 tantalum, niobium, tin), During his

> studies and doctoral thesis, he also spent several months doing fieldwork in Brazil, Australia, and Zimbabwe. In 2017 he joined Deutsche Lithium GmbH where he is in charge of mineral exploration and mining.



DR MATTHIAS REINECKE Chemist

Dipl.-Ing. for Materials Science (Graduate of University Mittweida / Germany) and holds a PhD in Chemistry (Technical University Freiberg / Germany), Dr. Reinecke has over 20 years of experience in industry in the area of process development in silicon crystallization and chemistry and of application of Li-ion battery systems for stationary storage. Has been with the Zinnwald Lithium Project since 2018





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