Altech Chemicals Limited ASX: ATC FRA:A3Y

Company Presentation

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Managing Director

Altech Chemicals Limited

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Tesla Battery Day 2020

- Halve the cost per KWh of battery production
- Below the $US100/KWh threshold
- “4680” Tesla cell (5x energy, 6x power)
- 3TWh per year at its own factories by 2030
- Equal 20 giga factories
- Increased use of Silicon in anodes

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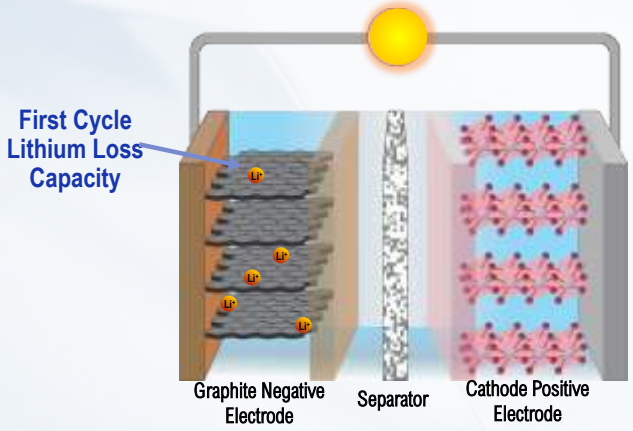
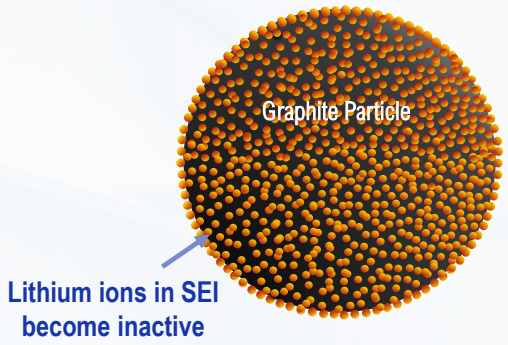
Problem facing today's lithium ion batteries

- Forms SEI layer on first charge
- Lithium becomes inactive
- 8-10% First cycle loss capacity



10% of lithium is lost on first charge



First charge loss reduces life of battery

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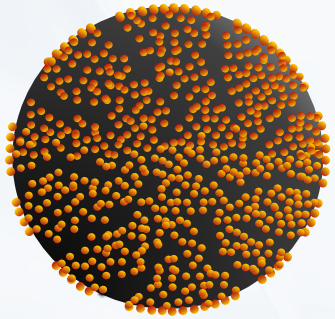
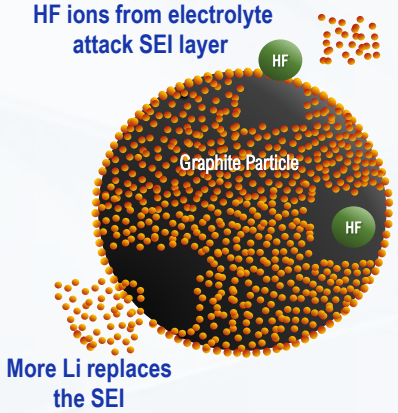
Continual consumption of Lithium

- SEI layer cracks, exposing new sites for further lithium adsorption
- Corrosive HF ions, attack SEI layer, creating further lithium degradation



Cracks in SEI layer creates further lithium loss

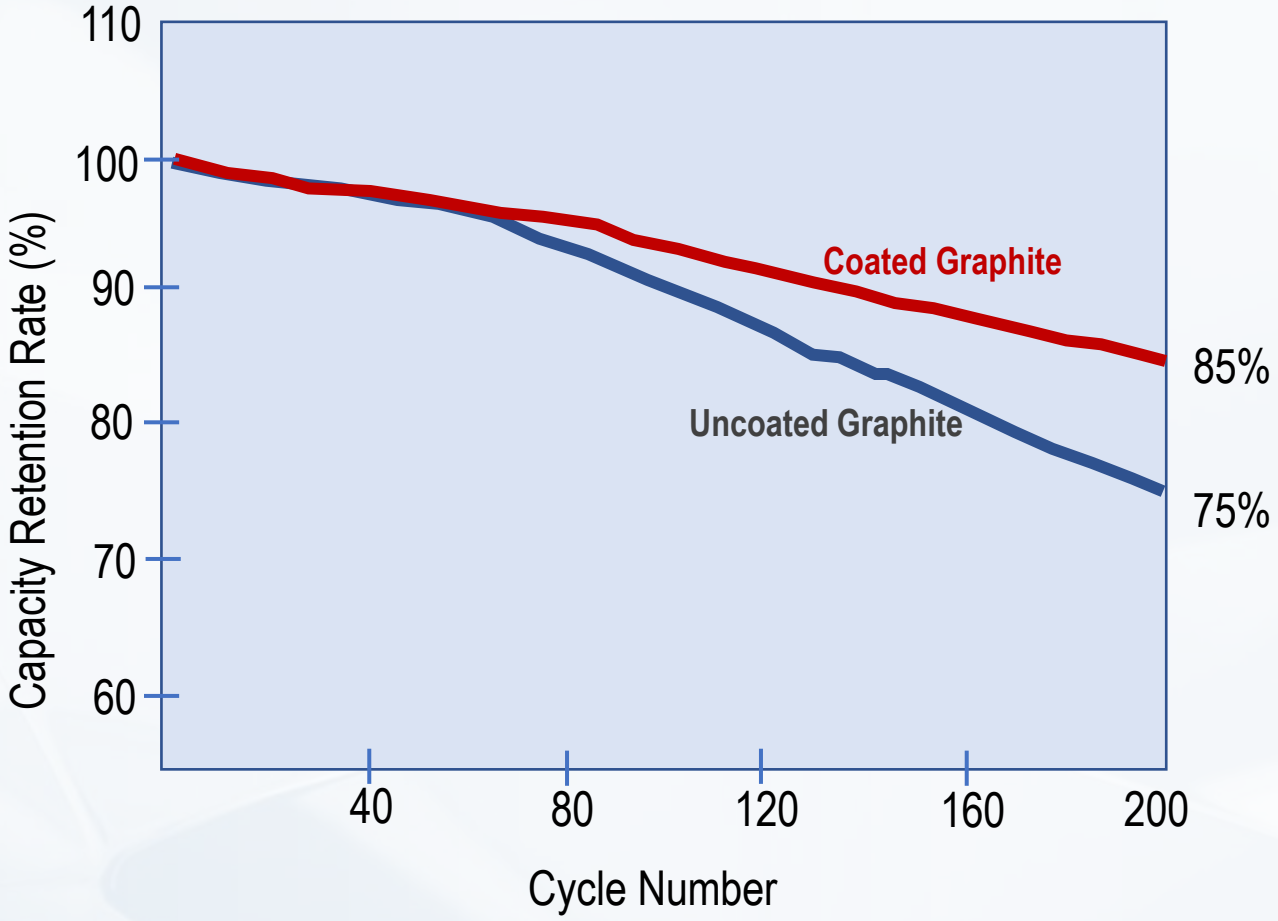


Corrosive HF ions creates more lithium loss

Why HPA Coating ?

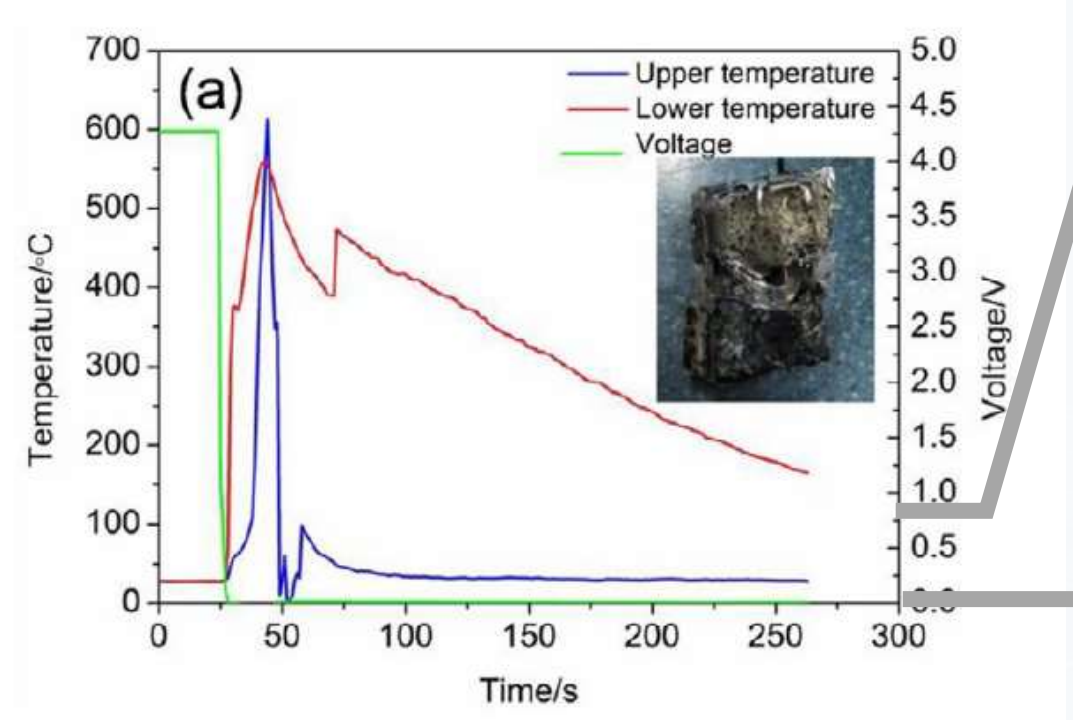
- Reduces first cycle loss (Tau et al., 2019)
- Improves cycling stability
- Improves high-rate performance (Feng et al., 2016)
- Improves fast charging capability (Kim et al., 2016)
- Prevents thermal runaway under mechanical abuse (Xu et al. 2019)

Literature - Alumina coated graphite performance [1]

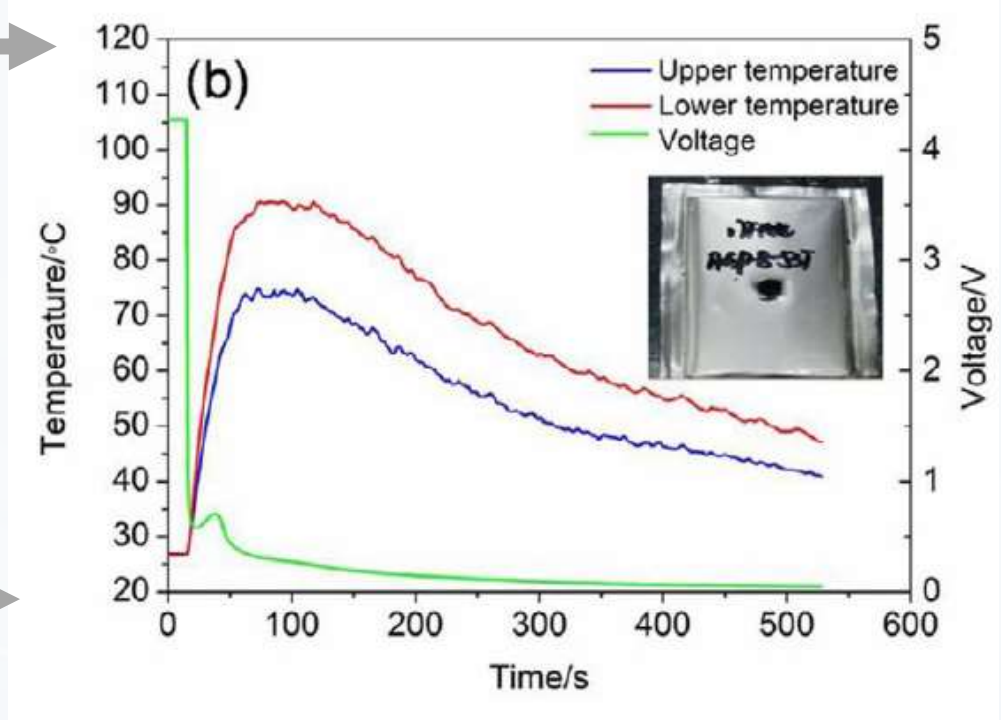


1. Synthesis of Alumina-Coated Natural Graphite for Highly Cycling Stability and Safety of Li-Ion Batteries
Tao Xu, Chengkun Zhou, Haihui Zhou,* ZekunWang, Jianguo Ren

Nail Test – Coated graphite prevents runaway [1]



Non Coated graphite 600 Deg C



Coated graphite 100 Deg C

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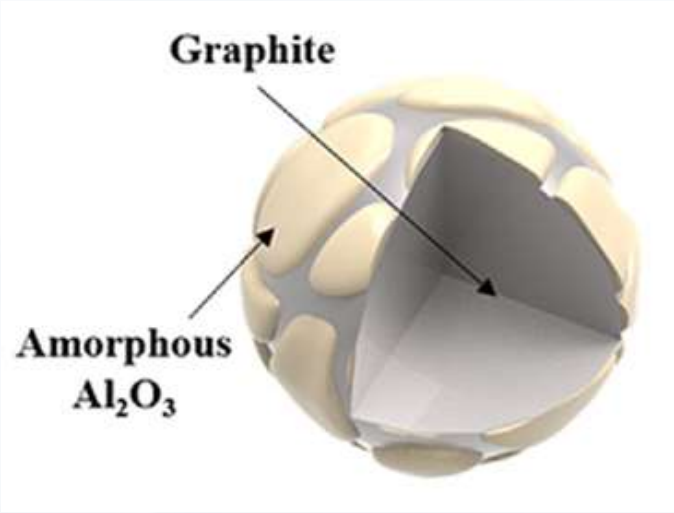
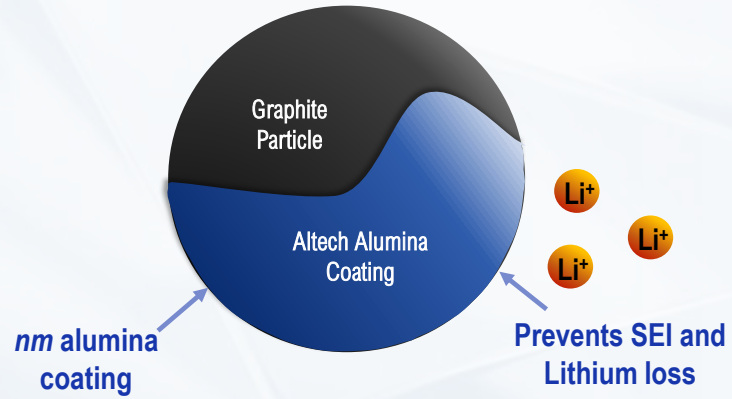
Coating Methods

1. Vapour Method
    - Atomic Layer Deposition – costly, complex, not mass production
2. Solids Method
    - Non continuous layer
3. Liquid Method
    - Most promising
    - Easy to comercialise



- 2 *nm* layer of high purity alumina coating
- Pre-forms an SEI layer
- Reduces first-cycle-loss capacity and increased battery life
- Alumina layer coverts corrosive HF to inert material



Our nano alumina coating technology is game changing

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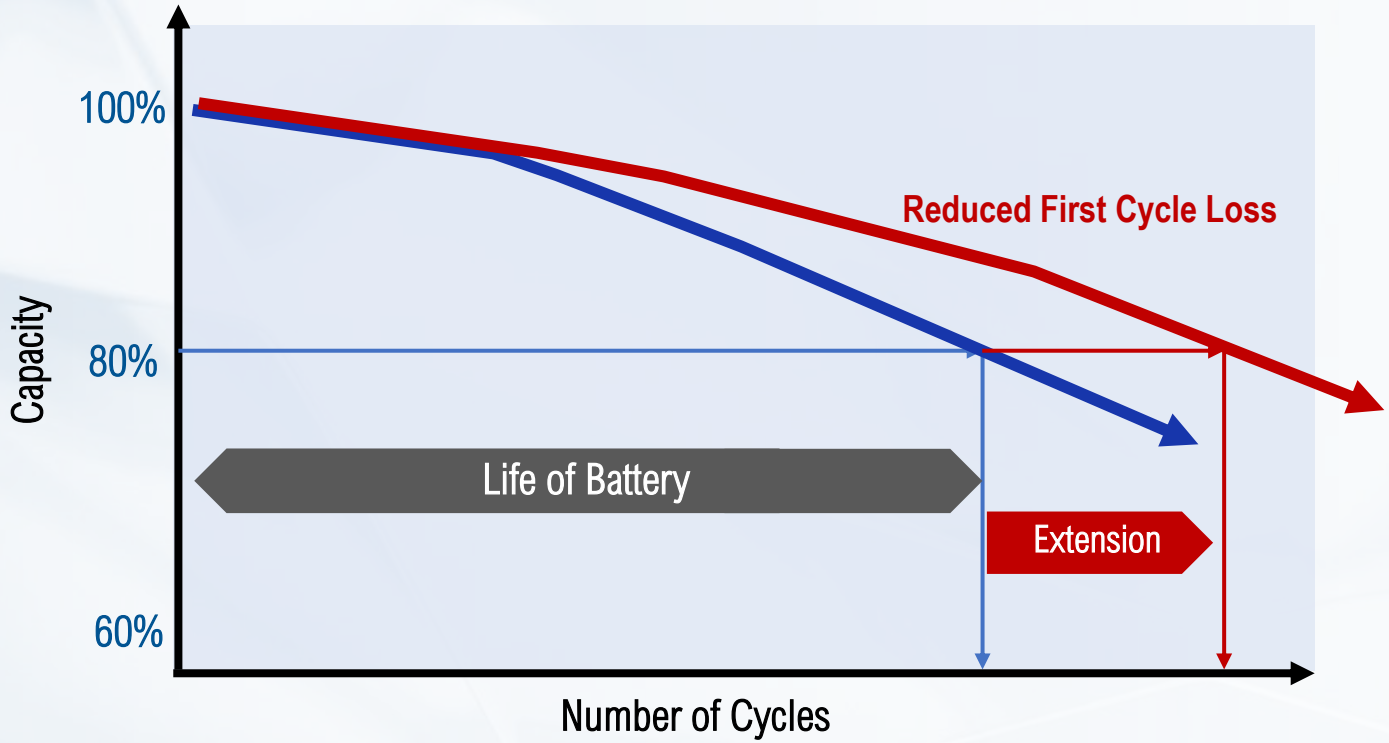

Potential increased battery life

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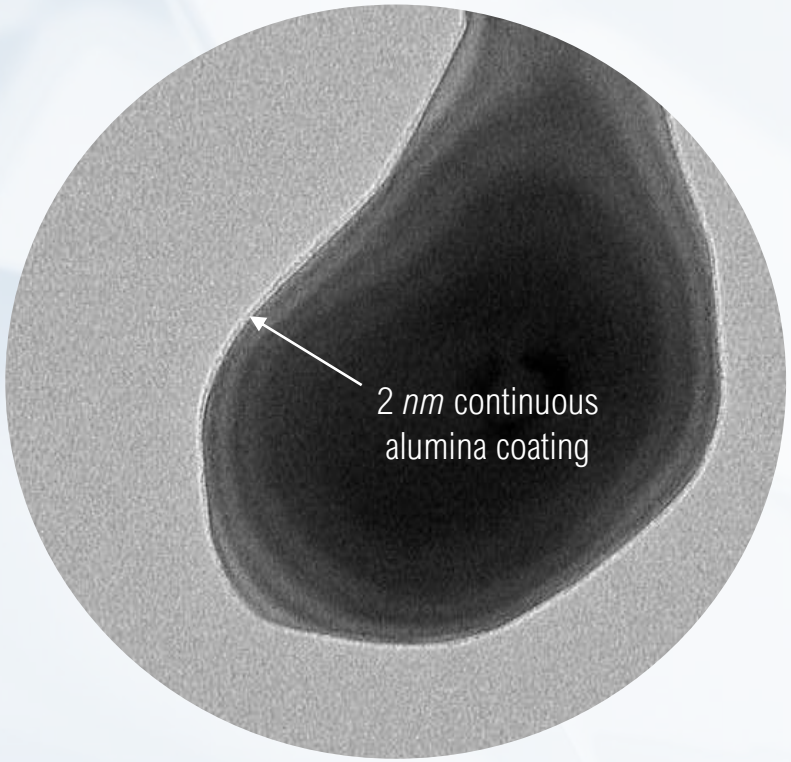
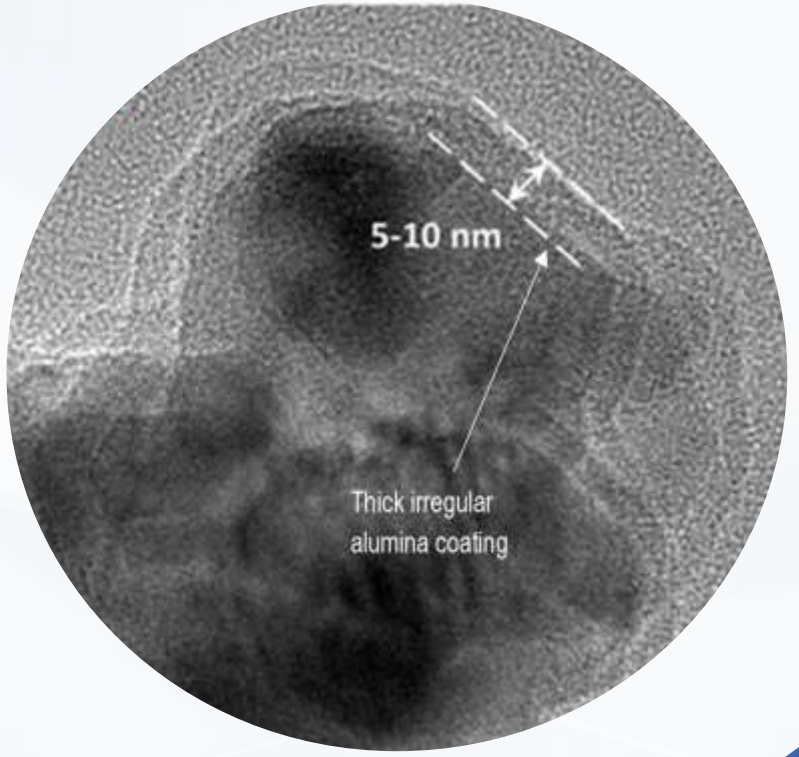
Under the Electron Microscope



Altech alumina coating technology



Current attempts at alumina coating

Promising Results in half cell battery testing

- First phase, 100 cycle battery tests completed
- Coated graphite performance over non coated is encouraging
- Further test runs required for repeatability
- Potential improvements to lithium-ion battery life, capacity and chargeability

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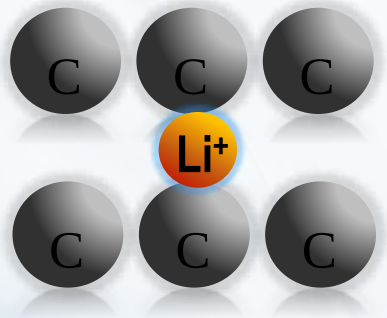
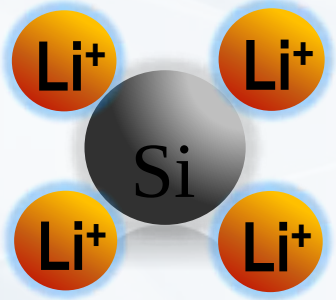
- Ten times capacity Si (3,579 mAh/g) C (372 mAh/g)
- Promising anode material
- But volume expansion 300% on lithiation (C 13%)
- But 40-50% first cycle loss
- But higher fade during life (short cycle life)

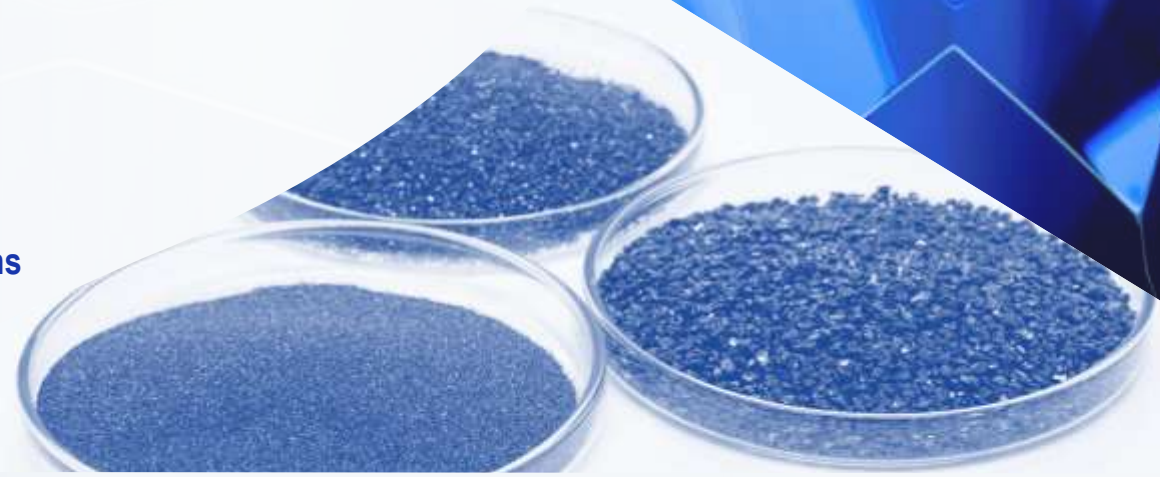


6 carbon atoms hold 1 Li^+ ion



1 Si atom holds 4 Li^+ ions

Silicon most promising future anode additive



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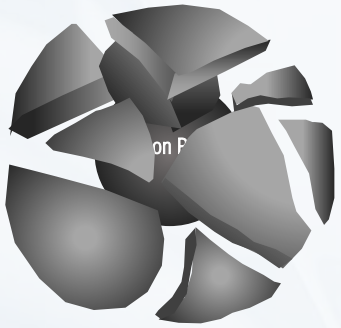
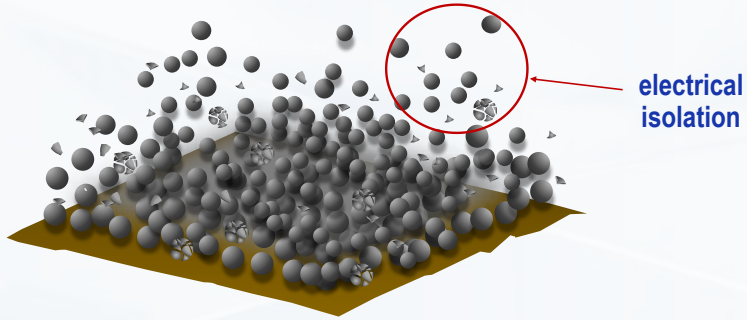
Barriers to Silicon Use

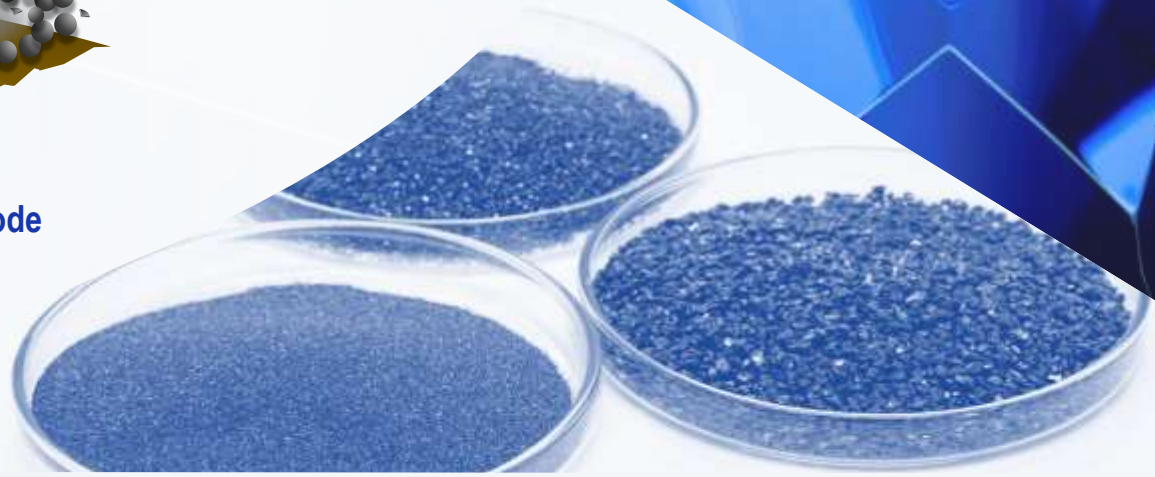
- 300% volume expansion causes fracturing
- In the anode it causes swelling
- Delamination & loses contact with copper foil
- Early failure of the battery



Fracturing of the Si particle



Delamination at the anode



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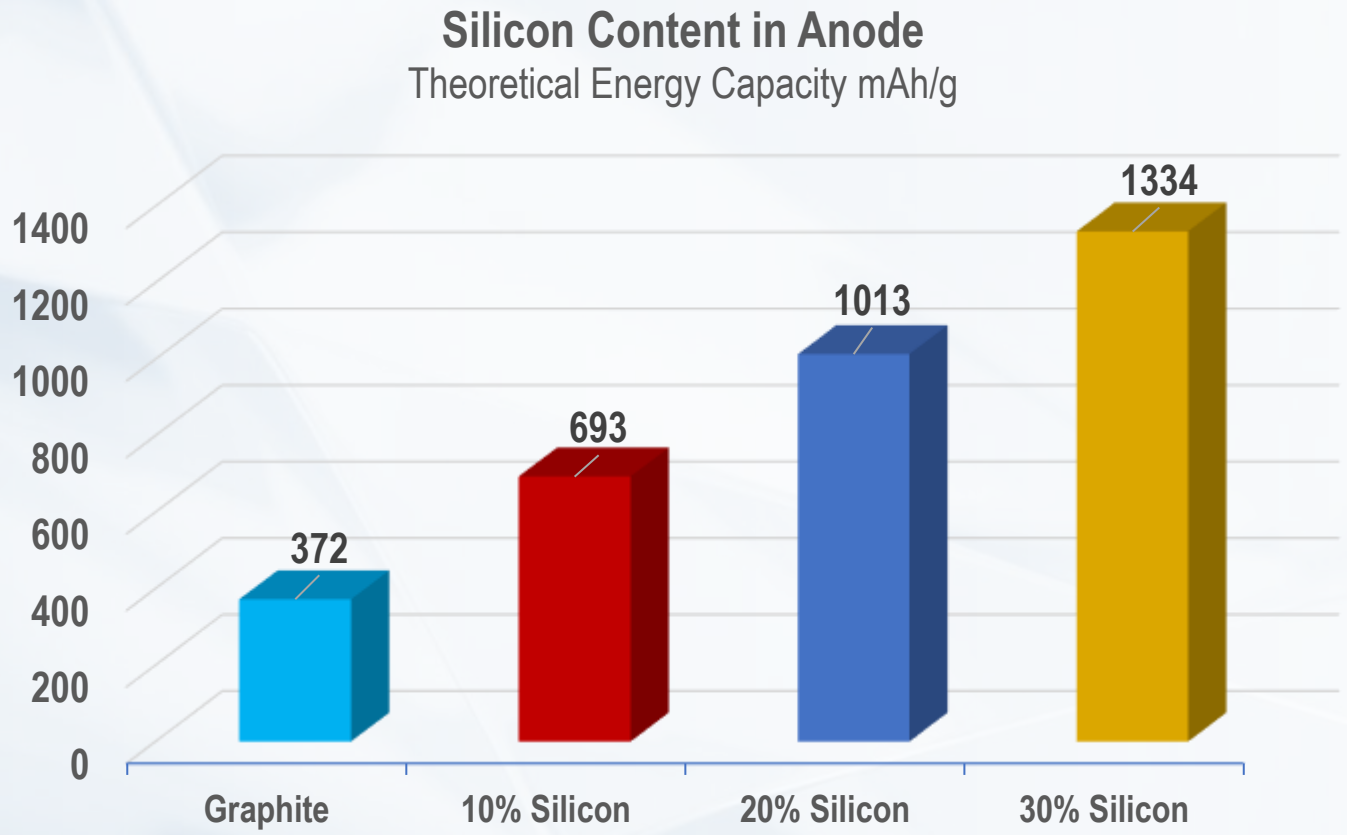

Theoretical Energy Capacity

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ASX ANNOUNCEMENT AND MEDIA RELEASE

15 March 2021

ALTECH – BREAKTHROUGH SILICON ALUMINA COATING DEVELOPMENT

Highlights

- Breakthrough silicon alumina coating development
- Tesla vision is for more silicon in lithium-ion battery anodes
- Silicon has ten times energy capacity compared to graphite
- Capacity retention during cycling potentially

Alumina coating of Silicon in our Lab

Altech's R&D Facility – Perth, Western Australia

Promising Results in half cell battery testing

- Lab tests shows positive results
- Coated silicon performance over non coated is encouraging

Impact of Silicon in anodes on Tesla Model 3

0% Silicon — 423km

10% Silicon — 680km

20% Silicon — 940km

30% Silicon — 1,190km

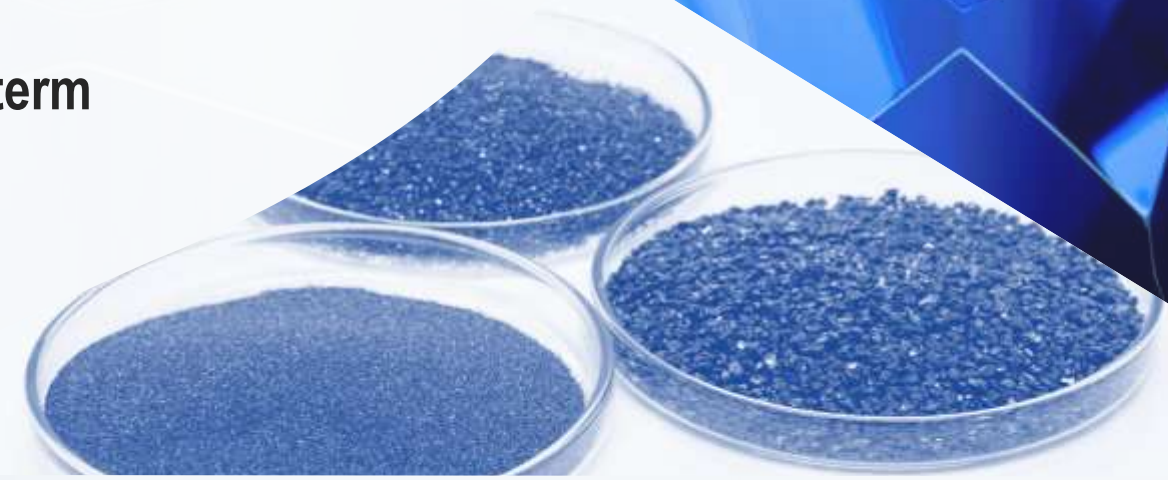
Collaboration Agreements with European Partners

- Collaboration agreement with SGL Carbon
- Europe leading synthetic graphite producer

SGL GROUP THE CARBON COMPANY

Ferroglobe

- Collaboration agreement with Ferroglobe
- Leading Li-ion battery Si supplier
- Alumina coating of silicon seen as long-term solution



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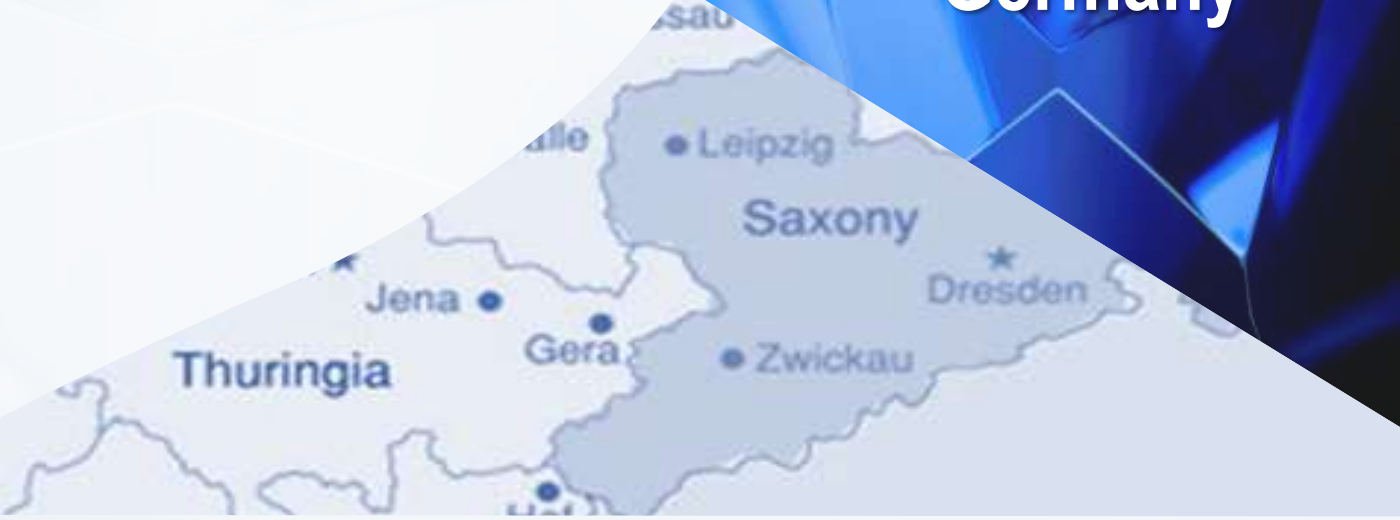
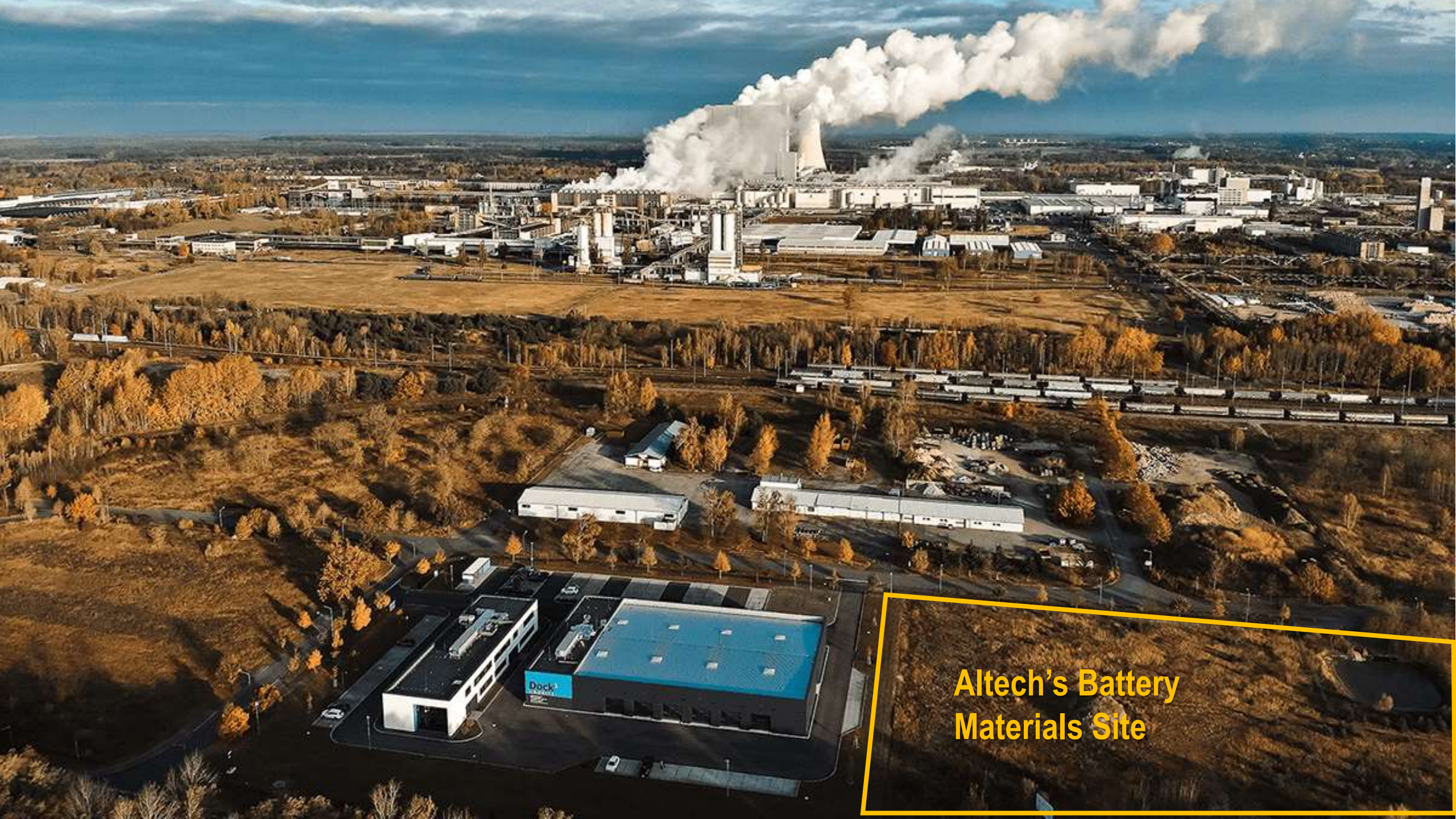
Battery Materials Coating Project Germany

- Pre-feasibility battery materials coatings plant
- Schwarze Pumpe, Saxony State, Germany
- State where EV's and battery plants
- Phase 1 – 10,0000 tpa graphite coating
- Option to purchase industrial site




Altech's Battery
Materials Site

Europe's Push for Battery Industry

- Next chapter of Li-ion battery story is Europe
- Europe major battery industry
- Capacity of 600 GWh by 2024
- Stringent 2020 EU CO2 emission (95g/km)
- Push to EVs by European car manufacturers
- Less reliant on Asia

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European auto market all electric by

JAGUAR — By 2025 $3.5b pa

BENTLEY — By 2030

BMW — By 2030 $6.5b

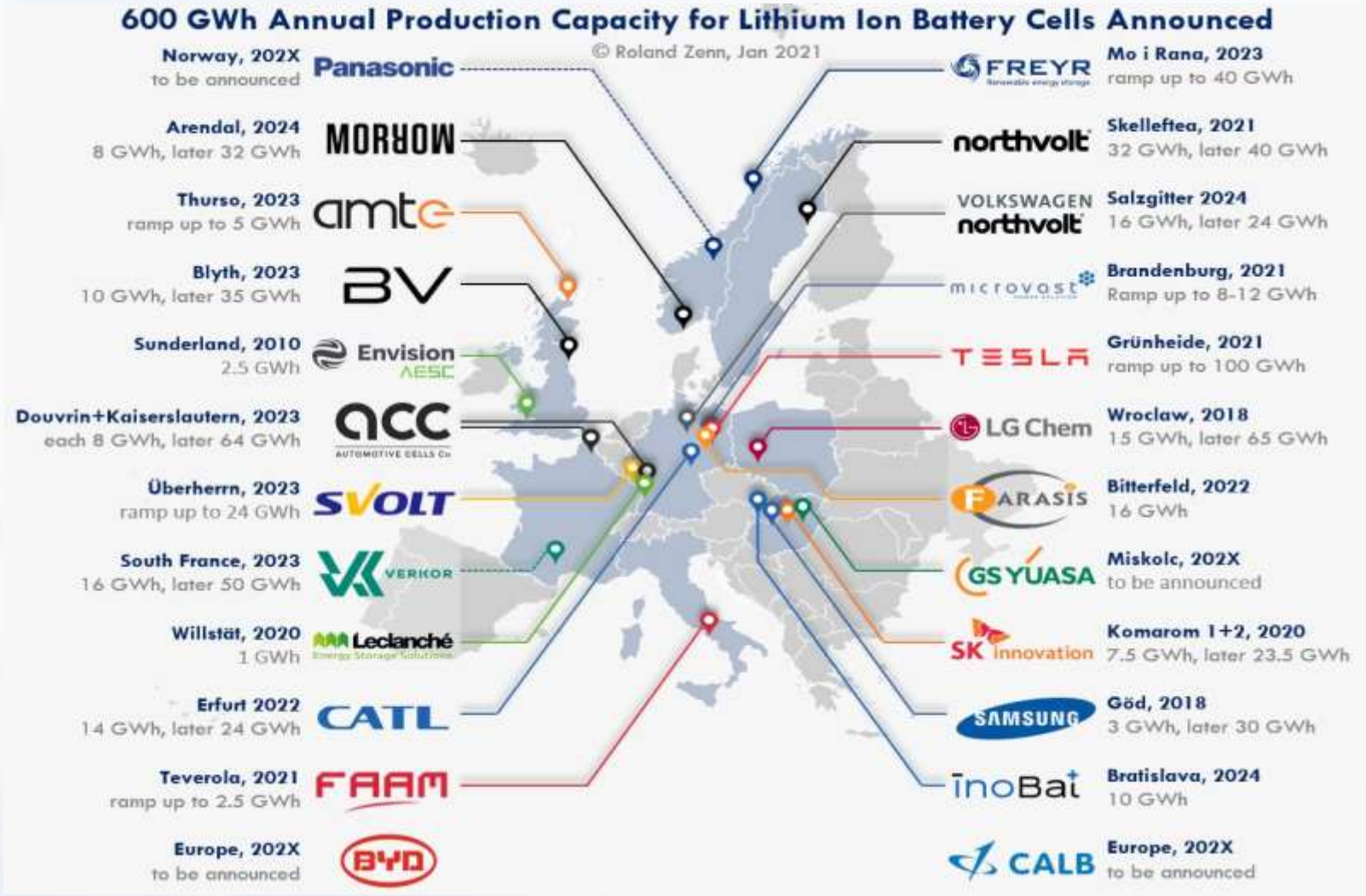
Audi — By 2033

VOLVO — By 2030 $1b pa

Volkswagen — By 2026 $86b

Daimler Mercedes-Benz — By 2040 $47b

Li-Ion Battery Cell Capacity - Europe




4,500 tpa High Purity Alumina Plant

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HPA Use and Market

- HPA 99.99% purity
- Feedstock for LED and Li-ion battery industries
- Sapphire wafer substrate for LEDs
- Alumina coating in Li-ion batteries
- Growth expected from 30ktpa to 272 ktpa by 2030
- Recent price forecast by Fact.MR *

*Fact.MR - High Purity Alumina Market Forecast, Trend Analysis & Competition Tracking Global Review 2016 2038

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Altech's disruptive technology

Current HPA Producers

Bauxite

Alumina Refinery

Smelter Grade Alumina
99.5%

Alumina Smelter

Aluminium Metal
~US$3,000 per tonne

Aluminium Dissolution

99.99% (4N)
HPA

Kaolin
(aluminous clay)

ALTECH HPA PLANT

One Single Process Step

99.99% (4N)
HPA

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HPA Project Summary

- 250 year Kaolin mine in Australia
- All permits in place – ready to dig
- HPA processing plant in Johor, Malaysia
- Stage 1 and 2 construction completed
- 9 patents pending
- Bottom quartile costs
- Certified “green” project by CICERO

HPA Project Summary

- 10 Year off take arrangement with Mitsubishi
- Lump sum build contract with SMS Group
- Senior loan of US$190m secured with KFW IPEX bank (ECA cover)
- Assessing US$144m junior debt – listed green bonds
- Looking for JV partner for US$100m for 49% of project

Economics FIDS Equity Model

- **Pre-tax NPV7.5 US$ 505 million**
- **Payback (full rate) 3.9 years**
- **IRR - 22%**
- **EBITDA US$ 76 million p.a.**
- **Capital cost US$ 298 million***
- **Production Costs - US$ 8.55 /kg**
- **LT Sale Price - US$ 26.9/kg**
- **Gross Margin – 68%**

- Pre tax, pre financing equity model

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Use and Source of Funds

Use of Funds (US$m)	
Plant Capex	$298
KfW Contingency	$ 28*
Debt Res & WC	$ 46*
Fees & Costs	$ 41
Less Spent	($ 23)
Total Use of Funds	$390

Source of Funds (US$m)	
KfW Senior Loan	$190
Sec Debt (Green Bonds)	$ 90
SMS Equity Contribution	$ 10
Project Equity (Sell 49%)	$100 ^
Total Funding	$390

- To date ATC has spent US$ 57m on the project incl Eng, land, Stage 1 & 2 construction
- Meckering deposit valued at (US$4/t) US$50.8m
- Total of US$107m for ATC 51%

* US$ 76 m of cash reserves required by KfW for project protection

^ Altech Advanced Materials AG has option to purchase 49% for US$100m

^ Open to other strategic investors or JV partners

Stage 1 & 2
Maintenance Building

Stage 1 & 2
Maintenance Building

Stage 1 & 2
Electrical Substation

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Right Place

Right Time

Right Feedstock

Right Technology

Thank you

Forward Looking Statements

Forward-looking Statements

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources are also forward looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as at the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of our Company, the Directors and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed or anticipated in these statements.

The green bonds terms referred to in this ASX announcement are indicative in nature; are non-binding; and contain the general terms of proposed a transaction. Any future commitment for the bonds will be subject to and is contingent upon all internal approvals of the structuring agent as well as the satisfactory completion of detailed due diligence (including but not limited to HPA market, legal and technical due diligence) and legally binding documentation including senior lender and inter-creditor agreements. There is no certainty that the green bond facility will be approved or that a transaction will be concluded based on what is contemplated in the term sheet. The Company makes no representations or warranties whatsoever as to the outcome of the green bond finance process.

Competent Persons Statements – Meckering Kaolin Deposit

The information in this announcement that relates to Mineral Resources and Ore Reserves is extracted from the report entitled "Maiden Ore Reserve at Altech's Meckering Kaolin Deposit" released on 11 October 2016; the report is available to view on the Company's website www.altechchemicals.com. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources and Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.