ARROWHEAD
BUSINESS AND INVESTMENT DECISIONS

Due Diligence and Valuation Report

Arrowhead Code:	28-02-09
Coverage reinitiated:	April 03, 2023
This document:	July 23, 2024
Fair share value bracket	AUD 0.45 – AUD 0.89
Share price (July 23, 2024):	AUD 0.055[i]

Analysts

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Company:	Altech Batteries Limited
Ticker:	ASX: ATC; FRA: A3Y
Headquarters:	Subiaco, Australia
Managing Director:	Iggy Tan
CFO:	Martin Stein
Website:	www.altechgroup.com

Market Data[ii]

52-Week Range:	AUD 0.047 – AUD 0.095
Average Daily Volume (3M Avg.):	1,628,887
Market Cap (July 17, 2024):	AUD 94.1 million (mn)

Company Overview: Altech Batteries Limited (Altech), previously known as Altech Chemicals Limited, is a specialized battery material technology and development Company based in Australia, with two projects being commercialized in Germany. The company is commercializing sodium-alumina solid-state grid storage batteries to address the challenges and shortfalls of lithium-ion batteries, through its disruptive and innovative technologies. The company is working on two leading technology projects, the CERENERGY® Batteries Project and Silumina Anodes™ Battery Materials Project.

With the CERENERGY® Batteries Project, Altech's initial strategy is to cater to the European grid storage market. The company has entered into a Joint Venture (JV) Agreement with the world-leading German government-owned Fraunhofer IKTS (Fraunhofer) to commercialize the revolutionary CERENERGY® Battery, which uses common table salt and ceramic solid-state technology. ATC intends to construct a 100 MWh production facility, with a long-term vision of constructing Gigawatt/s battery facilities, on Altech's land in Saxony, Germany.

Further, Altech has been working on battery material coating technology for use within electric vehicle (EV) battery anodes. It has successfully incorporated silicon into battery anodes and devised a battery anode material with a c. 30% higher retention capacity than a conventional graphite-only lithium-ion battery anode. Altech is currently developing a 10 kilotonnes per annum (ktpa) silicon/graphite Silumina Anodes™ coating plant in Saxony, which will also house a pilot plant which is designed to produce up to 120 kg per day of anode-grade coated battery material for production of samples for EV OEMs.

The company is progressing well to complete the ABS60kWh BatteryPack prototypes, which will then be available for testing and demonstration by potential customers. This will allow Altech to secure off-take agreements and finance the construction of the CENEREGY battery plant.

Altech is listed on the Australian Securities Exchange (ASX:ATC) as well as the Frankfurt Stock Exchange (FRA).

Key Highlights: (1) Altech has a JV agreement with Fraunhofer (September 2022) to commercialize the CERENERGY® Battery and fast tracking its Silumina Anodes™ qualification process; **(2)** Altech's long-term vision is to construct a Gigawatt battery facility in Saxony, apart from building a 100 MWh plant; **(3)** Altech increased the output capacity of the CERENERGY® project from 100 MWh to 120 MWh per annum in the Definitive Feasibility Study (DFS) completed in March 2024; the project will require an investment of EUR 156 mn, and is expected to generate Net Present Value (NPV) of EUR 169 mn, Internal Rate of Return (IRR) of 19% and a steady packback in 3.7 years; **(4)** Altech's Silumina Anodes™ Battery Materials Project's DFS, which was completed in December 2023, estimates post-tax NPV of EUR 684.8 mn, IRR of 34.6% and a payback period of 2.4 years; the capital cost of the project was estimated at EUR 112.5 mn, while it was expected to generate revenue of EUR 328 mn per annum at maximum capacity of 8,000tpa; **(5)** All the components of the first ABS60 BatteryPack prototype have been fabricated; once the welding of the cells to Cell Contacting System (CCS) is completed, five completed battery modules will be delivered to Fraunhofer; these modules will be mounted to form the first ABS60 BatteryPack prototype, available for testing by potential customers; **(6)** ATC raised USD 3.72 mn under its Share Purchase Plan (SPP) in May 2024 to be utilized for the production ABS60KWh CERENERGY BatteryPacks prototypes for customer testing and to advance the construction of the pilot plant at Saxony; **(7)** Altech received the final installment of EUR 1.583 mn from the sale of 25% of Altech's subsidiary Altech Industries Germany GmbH (AIG).

Key Risks: (a) Altech's inability to raise adequate funds could delay the commencement of its projects; **(b)** Altech's business is subject to various national and local laws and regulations that may have a material adverse effect on the company's business;

Valuation and Assumptions: Given the due diligence and valuation estimates, Arrowhead believes that Altech Batteries' fair market value per share lies in a range of AUD 0.45 to AUD 0.89, derived using NPV methodology.

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1. Investment Thesis

Arrowhead is updating its coverage on Altech Batteries Limited (ATC) with a fair value of AUD 0.45 per share in the low-bracket scenario and AUD 0.89 per share in the high-bracket scenario, derived using the NPV methodology.

Altech Batteries Ltd. has a lucrative opportunity to meet the surge in demand for grid battery storage, as well as the EV lithium-ion battery market, through its innovative and disruptive technology.

Burgeoning large addressable market may provide significant tailwinds going forward

Altech's flagship CERENERGY® battery project is specifically designed to cater to the needs of the grid (stationary) energy storage market. The grid energy storage market[iii] is projected to achieve a 28.0% CAGR in the coming decades. The global grid energy storage market, last year valued at USD 4.4 bn, is expected to reach c. USD 15.1 bn by 2027. With an increased output capacity of 120 MWh gridpacks per annum as per the DFS completed in March 2024, Altech's CERENERGY battery project is well-placed to capitalize on the growing global energy storage market demand.

Further, the outstanding results from the DFS of Silumina Anodes™ project completed in December 2023 increased its output capacity from 15 GWh to 120 GWh, without any significant change in the plant and equipment costs. Also, the plant will solely focus on producing alumina-coated metallurgical silicon products at a rate of 8,000 tpa, which will be integrated into the uncoated graphite source by the customers within their battery plants rather than at Altech's facility. Given the increasing demand for high-density batteries and the need to reduce reliance on graphite (due to export restrictions by China), Altech's alumina-coated silicon anodes will be a natural substitute for the industry. Moreover, the lithium-ion (Li-ion) battery chain, from mining to recycling, is expected to grow at a CAGR of over 30% from 2022 to 2030, reaching a value of more than USD 400 bn and a market size of 4.7 TWh, according to an analysis by the McKinsey Battery Insights team[iv].

The strategic projects operated by Altech intend to cater to the insatiable demand from end-users and demonstrate a massive opportunity for the company to move forward.

JV with a partner of sound repute, presenting substantial innovation opportunities

Fraunhofer-Gesellschaft, the world's leading applied research organization, is playing a major role in the innovation process by prioritizing key future-relevant technologies and then commercializing its findings in business and industry. Fraunhofer is a German government-owned company and currently operates 76 institutes throughout Germany, of which Fraunhofer Institute for Ceramic Technologies and Systems (Fraunhofer IKTS) conducts applied research on high-performance ceramics. The development of CERENERGY® technology testifies to the competencies of Fraunhofer, which revolutionized previous technology. The CERENERGY® battery technology uses common table salt and ceramic solid-state technology. This allows much lower production costs, which are estimated by Fraunhofer to be c. 40-50% cheaper than lithium-ion battery costs. The JV aims to commercialize the 100 MWh (Train 1) production facility at the Schwarze Pumpe Industrial Park in Saxony, Germany, on land owned by Altech. In the process, Fraunhofer has already tested the world's largest CERENERGY® type batteries in terms of capacity in stationary battery modules. Another of Fraunhofer's notable innovations is the MP3 digital audio coding format.

"Cracking the silicon barrier" marks a step-change

In 2020, Tesla stated publicly that it aims to increase the amount of silicon in its batteries to achieve a step-change in improvements in energy density and battery life. A higher energy capacity lithium-ion battery would translate not just into significant cost benefits but also into a potentially increased range in the case of EVs. In the words of Elon Musk "Silicon is the most promising anode material". The industry had faced significant challenges in incorporating silicon in lithium-ion battery anodes until Altech's significant breakthrough in lithium-ion battery technology, finally "cracking the silicon barrier" and successfully producing and testing lithium-ion battery anode materials with c. 30% higher retention capacity compared to conventional lithium-ion battery anode materials. To achieve this, Altech successfully combined silicon particles made with its innovative proprietary high-purity alumina (HPA) coating technology with regular battery-grade graphite to produce a lithium-ion battery electrode containing a composite graphite/silicon anode. Altech has launched and registered the product name "Silumina Anodes™" for its alumina-coated composite silicon/graphite lithium-ion battery anode material. Further, with the recent DFS on the project, the plant will solely be focused on producing alumina-coated metallurgical silicon products at a rate of 8,000 tpa, which will be integrated into the uncoated graphite source by the customers within their battery plants rather than at Altech's facility. Since silicon has 10x the energy retention capacity of graphite, Altech's batteries would have a higher energy retention capacity than normal batteries and much lower cost.

Economic developments boosted by government assistance will unlock significant value proposition

The Government of Saxony, Germany, has been extremely supportive. In 2020, it offered a grant of AUD 12.2 mn to Altech for the construction of the Silumina plant in Saxony at the Schwarze Pumpe Industrial Park, which houses

major global OEMs. The Federal Government of Germany has promised an investment of c. EUR 40 bn for this region and its industries, showcasing its supportive nature and creating a favorable environment for the companies to work in.

...but certain risks could impede growth plans

Altech has yet to secure financing for the project

Altech is in a capital-intensive industry. The company recently raised USD 3.72 mn under its SPP in May, which will be utilized to produce ABS 60KWh CERENERGY BatteryPack prototypes for customer testing and demonstration. Further, the funds will also be used to advance the construction of the pilot plant at Saxony. However, the company will need to secure additional funds for the commercialization and expansion of both projects. Financing would also be required to support ongoing operations and also implement planned strategies. The inability to secure sufficient funds could postpone/hamper the Company's growth plans, leading to the delay or cancellation of certain activities or projects.

Limited number of feedstock suppliers could create a supply-side risk

The Company is dependent on SGL Carbon GmbH and Ferroglobe Innovation S.L for the supply of Graphite and Silicon anode materials for its Silumina Anodes™ Project. This could pose a significant supply risk, as any adverse developments in the business environments of its suppliers may lead to a disruption of supplies, thereby creating an adverse impact not only on the financial performance of the Company but also on the reputation of the business for fulfilling its obligations.

Stringent regulatory environment could adversely influence the project's economics

Altech's business is subject to various national and local laws and regulations relating to the production, marketing, pricing, transportation and storage of the Company's products, in each of the countries in which the Company operates or may operate. Permits from a variety of regulatory authorities may be required for aspects of the Company's operations. However, any amendments to existing laws or the imposition of new laws may have a material adverse effect on the Company's proposed business and financial condition.

Investment thesis conclusion

The Company plans to strategically position itself to cater to the growing demand for grid storage through its CERENERGY® battery project developed in partnership with Fraunhofer. Altech's innovative technology is addressing the challenges faced by the industry in putting silicon into the anode chemistry of lithium-ion batteries, thereby paving the way for significant growth opportunities in the segment. However, on its way to becoming a reliable and preferred specialized battery material company in the market, it must overcome certain hurdles that might pose a threat to the company, such as raising adequate funds for the project, stringent regulatory environment and effectively diversifying its supply-side risk.

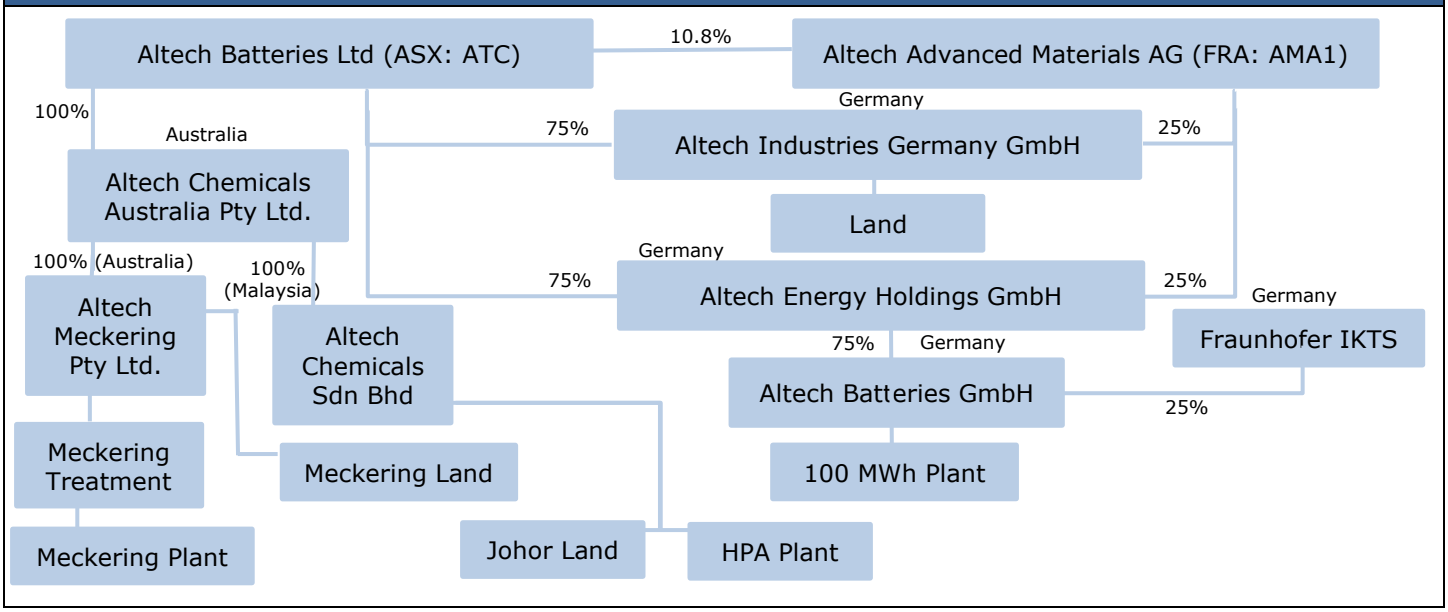
2. Business Overview

2.1 Introduction

Headquartered in Perth, Australia, Altech Batteries is a specialty battery material technology and development Company with a specific focus on downstream battery and battery materials development. The Company aspires to solve current challenges in the Electric Vehicle (EV) and grid storage battery segment through its disruptive or innovative technologies, making breakthroughs in the use of the respective applications. Altech is currently working on two main projects:

- CERENERGY® Batteries Project
- Silumina Anodes™ Project

Exhibit 1: Corporate Structure[v]



The Company has entered into a joint venture (JV) agreement with world-leading German battery research and development (R&D) institute Fraunhofer IKTS (Fraunhofer), with Altech as the major owner, together with associated entity Altech Advanced Material AG, controlling 75% of the JV through Altech Batteries GmbH. The aim is to commercialize the revolutionary CERENERGY® Sodium Alumina Solid State (SCSS) battery, a cheaper and safer alternative to lithium-ion batteries, with plans to construct a 100 MWh production facility on Altech's land in Saxony, Germany. The facility intends to produce CERENERGY® battery modules to provide grid storage solutions to the market.

Altech has also licensed its proprietary HPA coating technology to the 75%-owned subsidiary AIG to develop a 10,000 tonnes per annum (tpa) silicon/graphite alumina coating plant in Saxony, Germany to supply its Silumina Anodes™ product to the European EV market.

Altech is listed on the Australian Securities Exchange (ASX) under the ticker "ATC" and the Frankfurt Stock Exchange (FRA) under the ticker "A3Y". In February 2023, the company changed its name from 'Altech Chemicals Ltd.' to 'Altech Batteries Ltd.', to improve the marketing of the company's future products.

2.2 Projects

2.2.1 CERENERGY SCSS Battery Project[vi]

The CERENERGY® sodium alumina solid state battery, which uses common table salt and ceramic solid-state technology, has been developed to cater to the grid battery storage market, which the Company believes has huge opportunities going forward.

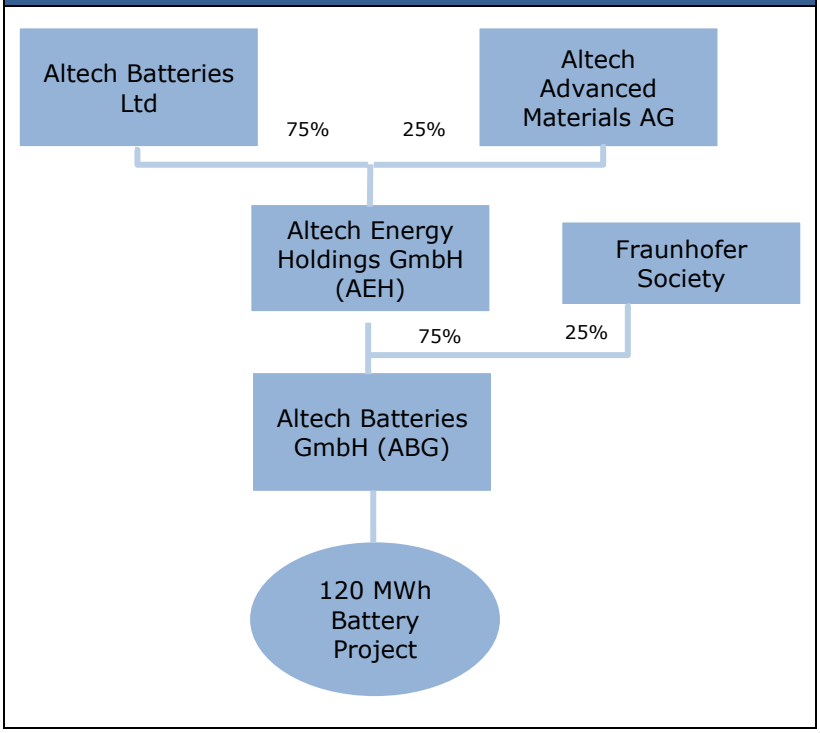
2.2.1.1 Fraunhofer IKTS

Fraunhofer-Gesellschaft was founded in 1949 in Germany, and is now the world's leading applied research organization. It prioritizes key future-relevant technologies and commercializes its findings in business and industry, with a major role in the innovation process. It operates a network of 76 institutes and research units with over 30,000 employees throughout Germany. The Fraunhofer Institute for Ceramic Technologies and Systems is one of the 76 institutes and conducts applied research into high-performance ceramics. As a research and technology service provider, Fraunhofer develops advanced high-performance ceramic materials, industrial manufacturing processes and prototype components and systems in complete production lines up to the pilot-plant scale.

Previously, Fraunhofer had been searching for an entrepreneurial partner with the ability to meet the following criteria:

- Availability of land in Germany
- Access to funding
- Experienced battery manufacturer with proven technology in alumina usage in ceramics
- Builder of projects

Exhibit 2: CERENERGY® JV structure[vii]



2.2.1.2 Joint Venture (JV) with Fraunhofer IKTS[viii]

In September 2022, a JV was formed between Altech Batteries GmbH (ABG) and Fraunhofer to commercialize a 100-Megawatt hour (MWh) sodium alumina solid-state (CERENERGY®) battery project in Saxony. ABG will own a majority (75%) stake in the JV, with Fraunhofer owning the remaining 25%. AEH is the holding company of ABG, owned by 'Altech Batteries Ltd.' (ATC) and 'Altech Advanced Minerals AG' (AAM), with ATC having a majority stake in AEH of c. 75%.

Below are the details of the JV:

- ABG has executed a license and IP transfer agreement with Fraunhofer, whereby ABG will be granted worldwide use of IP and knowhow associated with the CERENERGY® battery project
- As a part of the agreement, Fraunhofer will provide access to pilot plant, trials and technical expertise associated with CERENERGY® technology
- ABG will have the exclusive right to use the CERENERGY® trademark for SCSS batteries
- R&D agreement with Fraunhofer for a period of four years to progress the DFS, funding, construction, commissioning and startup of the 100 MWh plant
- In exchange, Fraunhofer will be provided with 25% "free carried" interest on the 100 MWh project (Train 1) with no royalties payable
- Altech group will provide land for the 100 MWh project on an arms' length basis
- On final payment under the R&D agreement, Fraunhofer will transfer the rights to all CERENERGY® IP to ABG, making ABG the owner of CERENERGY® battery technology, IP and trademark
- If ABG decides to expand the project to Train 2 i.e., Gigawatt Battery Facility, Fraunhofer has the right but not the obligation to maintain a 25% interest in Train 2
- FRAUNHOFER has the option to convert 25% of its interest in Train 2 to a 1.5% royalty on all future battery module sales

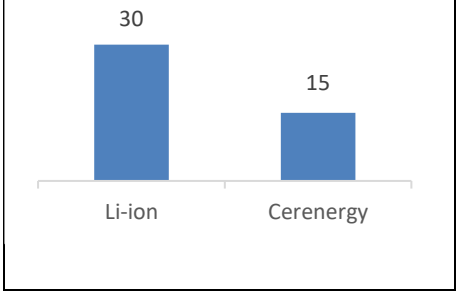
Developments and plans

Over the past eight years, Fraunhofer IKTS has pioneered the CERENERGY® technology, featuring cells three times larger, specifically tailored for grid storage applications. This innovation is a step-up to the previous technologies, enabling greater energy capacity and reduced production expenses. Fraunhofer has spent EUR 35 mn on R&D and on SCSS batteries and operates a EUR 25 mn pilot plant in Hermsdorf, Germany.

The first CERENERGY® modules with 5kWh storage capacity were created in 2018. Fraunhofer IKTS completed a pilot production line in 2021, facilitating increased capacity and the introduction of a 10 kWh prototype battery module in 2022.

The joint venture elected to develop a 120 MWh CERENERGY battery plant on Altech's site in Saxony, Germany. The proposed battery plant will produce 518,400 cells, 2,160 60 kWh modules and 120 MWh GridPacks per annum. The target GridPack price is competitive and based on market rates of installed lithium-ion batteries and other grid storage technologies. The biggest cost advantage of the CERENERGY batteries at the 120 MWh plant capacity is the expected low cost of EUR 0.06 per kWh for the life of the battery, compared to lithium-ion batteries at EUR 0.149 per kWh. This is because the CERENERGY batteries have no moving parts, cooling fans or heating, ventilation and air conditioning (HVAC) systems and do not require a fire protection monitoring system as opposed to lithium-ion battery systems. In addition, costs in relation to CERENERGY battery production will reduce significantly as capacity increases to GWh production.

Exhibit 3: GHG Emission Footprint compared to Li-ion Batteries[ix]



Altech had updated the DFS output capacity of the CERENERGY project from 100 MWh to 120 MWh gridpacks per annum after the final stages of facility design. This 20% enhancement in the plant output is without incurring any additional capital costs. As per the DFS, with a capex investment of EUR 156 mn, the project is expected to generate an NPV of EUR 169 mn and net cash flows of EUR 51 mn annually. The internal rate of return is estimated to be 19%, with a packback period of 3.7 years. At full capacity, the anticipated revenues would be EUR 106mn. The project is expected to generate EBITDA of EUR 51 mn (EBITDA margin of 47%) even with a small first production line capacity.

Production of 5kWh and 10kWh prototype battery modules was initiated in 2023 to conduct performance tests and qualify them for customer use. However, the pilot line underwent a comprehensive redesign to facilitate the manufacturing of ABS60 kWh BatteryPack prototypes. The BatteryPack consists of five 12kWh modules with 48 cells each, mounted on top of each other and sealed in a thermal-isolated stainless steel hood housing.

All prototype materials have been procured from specific suppliers and the fabrication of all the components has been completed. The welding of these cells into the CCS is underway, after which five completed battery modules will be delivered to Fraunhofer IKTS in Dresden. Here the five modules will be mounted into the ABS60 BatteryPack and the first ABS60 Prototype will be completed. Once the prototype is complete, it will be available for demonstration to potential customers to test it for practical applications and benefits of the ABS60 series in various industries. This will enable Altech to secure long-term off-take agreements with customers, thereby commercializing the BatteryPacks.

2.2.1.3 Challenges related to Lithium-ion batteries[x]

Below are the limitations of lithium-ion batteries as compared to CERENERGY® batteries:

Thermal runaway: One of the significant drawbacks of lithium-ion batteries is the risk of thermal runaway, which is a chain reaction within a battery cell that can be exceedingly difficult to stop once it has started. It occurs when the temperature inside a battery reaches the point that causes a chemical reaction (producing oxygen) to occur inside the battery. It is often caused by overheating, physical damage or overcharging and frequently leads to fires and explosions, as has been in the news recently. Today's lithium-ion battery contains a flammable liquid electrolyte and a flammable plastic separator, which further exacerbates the risk of fire and explosion.

Narrow operating range: Lithium-ion batteries operate in a relatively narrow temperature range, which is between +15°C and +35°C. At lower temperatures, the liquid electrolyte in the battery becomes more viscous, which slows the lithium transfer and reactions. At 0°C the capacity of the battery is reduced to 70%, which makes the application of lithium-ion batteries in cold and dry climates, such as deserts, extremely challenging. Often, available battery energy is used in the heating or cooling of these batteries.

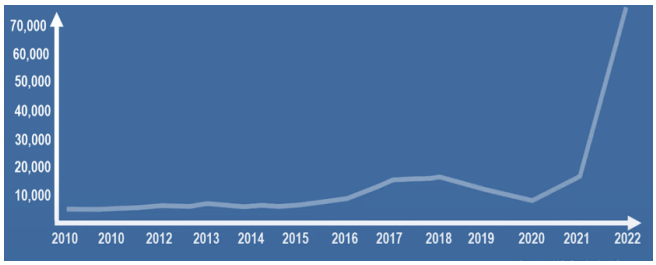
Battery lifespan: Generally, the life of lithium-ion batteries is limited to between seven and ten years, depending on the application, while for electric vehicles, OEMs tend to guarantee a battery life of around eight years. Lithium-ion degrades with each charge and discharge cycle. This deterioration is often due to detrimental side reactions, dendrite growth, and the breakdown of anode and cathode structures. This degradation is much faster when the battery is operated outside the ideal temperature range. However, for grid storage batteries, a life span of seven to

ten years can be expected. For grid storage, the storage costs including replacement costs are the long-term storage costs of a battery.

Critical battery raw material costs, availability and concerns: As a lithium-ion battery comprises a range of critical battery raw materials, such as nickel, lithium, manganese, cobalt, and graphite, it is under sustained pressure in terms of availability, geo-political supply-chain risk, and environmental & social governance concerns, which have been aggravated post-Covid. We discuss the precarious market scenarios of some of the critical battery raw materials below:

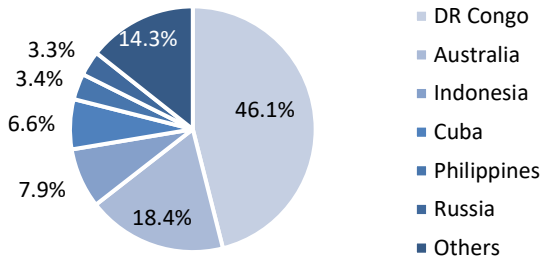
- **Lithium:** Although the global market for lithium is growing rapidly, the price of lithium, the most critical component of a lithium-ion battery, has risen six-fold since the start of 2022, putting upward pressure on the production costs associated with lithium-ion batteries. The production of lithium is concentrated in four countries, namely Australia, Chile, China and Argentina. Given growing demand for EVs and a static energy storage market, there are not enough mines and production capacity being developed to meet the forecast demand, which might lead to supply-side constraints going forward.

Exhibit 4: Price of battery-grade lithium carbonate per metric ton in U.S. dollars[xi]



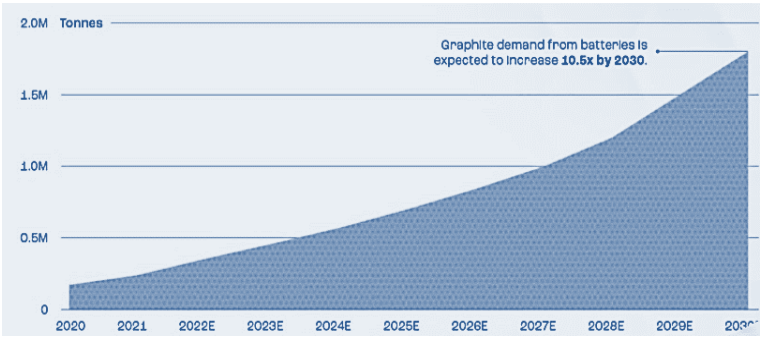
- **Cobalt:** Cobalt is used to boost energy density and battery life, keeping the cathode layered structure stable as lithium ions transfer into and out of the cathode during battery operation. It is considered the material with the highest supply-chain risk for EVs in the short and medium term, as c. 70% of production and 46% of reserves of cobalt come from the Democratic Republic of Congo (DRC). Stories of the harsh and dangerous working conditions, child labor and human rights abuses in the DRC have raised ethical concerns over cobalt supply.

Exhibit 5: Global cobalt reserves by country (%)[xii]



- **Graphite:** Graphite is considered indispensable to the global shift towards EVs. It is also the largest component in lithium-ion batteries by weight, with each battery containing 20-30% graphite, followed by cobalt, which is 20%. It takes 30 times more graphite than lithium to make the batteries due to losses in the manufacturing process. The onset of graphite deficit is mostly driven by demand for the EV battery anode ingredient, which exceeds supply, resulting in price increases. The industry is heavily reliant on China, which produces 90% of the world's graphite anode material, representing a concerning geo-political risk to the industry. **(Exhibit 6)**

Exhibit 6: Graphite demand from lithium-ion batteries[xiii]



- **Copper:** Copper is mainly used as the current collector on the anode part of a lithium-ion battery. Copper is set to face the biggest supply challenge of the four materials mentioned in this section amid the energy transition and increased EV demand, as an EV requires 2.5 times more copper than a standard Inner Combustion Emission (ICE) vehicle. However, there are not enough copper mines being built or expanded to provide all the copper needed to produce the forecast demand from EVs.

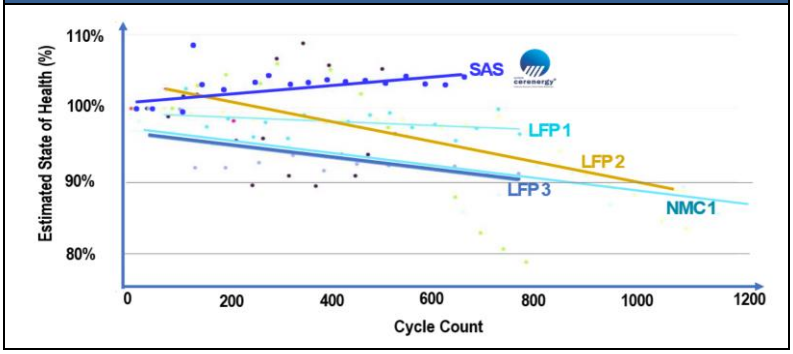
2.2.1.4 Solution[xiv]

With all the different challenges that lithium-ion batteries face, Altech's introduction of Sodium Alumina Solid State CERENERGY® Batteries might prove to be a potential game changer that could revitalize the grid storage and EV market by addressing the concerns faced by lithium-ion batteries today. Some of the key characteristics of CERENERGY® Batteries are as follows:

- **No thermal runaway risk:** CERENERGY® batteries are totally fire and explosion-proof and are not prone to thermal runaway. This constitutes one of the biggest advantages over lithium-ion batteries, since:
  - The battery does not contain any flammable liquid electrolyte or plastic separators, as the electrolyte is a solid inflammable ceramic tube that allows sodium ions to transfer through it.
  - The chemical reactions inside the battery do not generate oxygen at the cathode, unlike the lithium-ion battery

  As a result, it is ideal for indoor industrial and commercial energy storage installations, where the battery is safe and does not react with water and is highly sought-after for sensitive environments
- **Wider operating range:** CERENERGY® batteries operate efficiently within a -20°C to +60°C range. The performance of the battery and its durability are independent of the ambient temperature. CERENERGY® battery has replaced the liquid electrolyte used in lithium-ion batteries with solid ceramic electrolytes, where ambient temperature does not adversely affect the performance of the battery. The internal temperatures of CERENERGY® batteries are exceedingly high (they operate at c. 300ºC), but the batteries are fully insulated so the outside of the battery module is at "human touch" temperature. Even with such a high core temperature, the battery is self-sustaining and does not require cooling like lithium-ion batteries. This makes it suitable for grid energy storage batteries for extreme climates, which is the main disadvantage of lithium-ion batteries even today.
- **Battery lifespan:** Unlike lithium-ion batteries, there is no sodium ion degradation with each charge and discharge. As a result, there is no first-cycle loss, detrimental side reactions, dendrite growth, or breakdown of anode and cathode structures. The absence of liquid electrolyte, replaced with solid ceramic, means there is virtually no sodium deterioration in the battery. The life span of a CERENERGY® battery is beyond 15 years. In a recent study conducted by ITP Renewables, the CERENERGY® type battery did not show any deterioration in the estimated state of health in the first 700 cycles of testing, as compared with the normal deterioration in LFP and NMC lithium-ion batteries.

Exhibit 7: Life span testing of various batteries including CERENERGY® type batteries[xv]

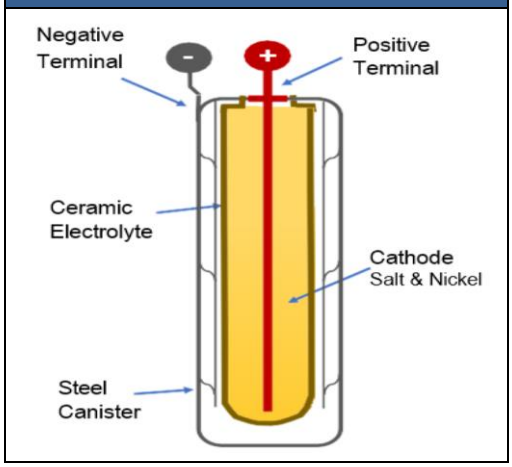


- **Negligible usage of critical battery raw materials:** CERENERGY® batteries do not contain the majority of the critical battery raw materials used in lithium-ion battery. CERENERGY® batteries do not contain lithium; instead, they use sodium ions from common table salt as a critical raw material, which is much cheaper than lithium and is readily available. As a result, CERENERGY® batteries are not exposed to rising lithium prices and the potential supply constraints of lithium globally. The cathode in CERENERGY® batteries consists of salt (equally ideal for energy storage in batteries) and nickel. The absence of cobalt in CERENERGY® batteries means they are not exposed to ethical or supply-chain issues; it also increases their effectiveness in terms of specific energy, which is c. 110-130 Wh/kg compared to an LFP lithium-ion battery at 90-160 Wh/kg. Moreover, another unique feature of the CERENERGY® battery is that it does not contain any graphite or copper in the anode part of the battery, making it graphite-free and copper-free.

2.2.1.5 CERENERGY® battery and its working principle[xvii]

A CERENERGY® battery, based on solid state technology and developed by Fraunhofer, consists of a ceramic tube (conductive to sodium ions but insulator for electrons) with a positive terminal. The solid ceramic tube performs the same function as a liquid electrolyte in a lithium-ion battery, allowing sodium ions to transfer through it. These large solid ceramic tubes with micro-structures allow fast sodium ion transfer. The ceramic tube is filled with cathode granules consisting of common table salt and nickel, to ensure contact between the solid cathode granules and the ceramic electrolyte tube. The tube is flooded with sodium aluminum chloride medium. This ceramic tube, which is housed in a steel canister, acts as the negative terminal. Both positive and negative terminal tabs are installed at the top of the cell for the transfer of electrons and connection to other cells. Each cell operates at 2.58V and a collection of 240 cells is installed in a refractory insulated module casing. Each module is rated at 60 KWh.

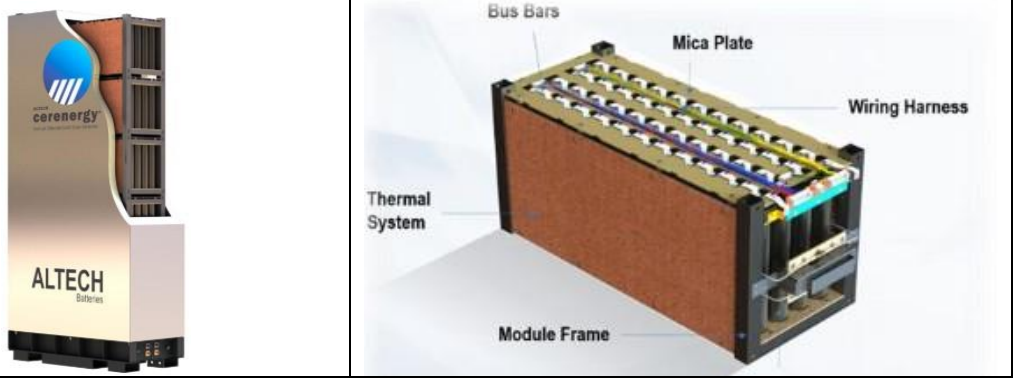
Exhibit 8: CERENERGY® battery components[xvi]



The technology highlights of CERENERGY® batteries are high specific energy with excellent performance and cycle life in harsh operating environments, along with ultra-long battery lifespans and low environmental impact.

While charging, electrons flow from the positive terminal to the negative terminal. As a result, sodium ions from the salt (sodium chloride) migrate through the solid ceramic electrode towards the negative canister terminal, thereby forming a molten anode layer on the outside of the ceramic tube, contacting the steel canister. The remaining chloride ions attach themselves to the nickel to form nickel chloride in the cathode medium. During discharge, electrons flow back, molten sodium is oxidized into sodium (Na+) ions and gets transferred back through the solid-state ceramic tube forming sodium chloride. Nickel chloride is reduced back metallic Nickel.

Exhibit 9: ABS60 CERENERGY® batteries[xviii]



The Altech Grid Packs have been specifically engineered to adhere to the Ingress Protection (IP) 65 standard, which addresses the shortcomings by ensuring complete protection from both dust and inclement weather thereby making outdoor installations safe irrespective of the weather conditions. Also, Grid Packs will be constructed using a sea container design for easy transportation by sea or road to the installation site, as well as ensuring simple installation. Additionally, the stackable design minimizes the battery footprint and can be stacked on top of each other. The "plug and play" feature of the site installation for the Grid Packs ensures that they can be easily installed in remote locations, thereby making the Grid Packs easily scalable and adaptable to meet future energy storage requirements of the site. Furthermore, the Grid Packs are designed without the requirement for thermal management, thereby making a completely noise-free operation, which makes them an ideal solution for noise-sensitive environments, unlike lithium-ion battery mega packs.

CERENERGY has lined up ABS60 (60 KWh Battery Pack) batteries tailored for commercial application and ABS1000, a high-capacity 1 MWh GridPack designed for industrial and grid-level power needs. These batteries demonstrate exceptional resilience, the ability to withstand various weather conditions and fire resistance, while also being suitable for frequent cycling. It offers the most competitive energy storage expenses within the industry, when contrasted with lithium-ion options. Finally, it's low maintenance feature over battery life makes it a preferred choice for companies seeking a reliable and long-lasting energy storage solution.

Exhibit 10: ABS1000 Grid Pack[xix]

Battery Specifications

With close collaboration with Fraunhofer IKTS, Altech has developed these specifications for its ABS60 and ABS1000 Grid Pack battery products to cater to the evolving needs of the renewable energy and grid storage market, thereby serving a significant milestone for the company. This will enable the company to initiate discussions with potential off-take partners and secure future sales in an expanding grid storage battery market.

ABS60 BatteryPack

The 60kWh Altech Battery Pack consists of five 12kWh modules with 48 cells each, mounted on top of each other and sealed in a thermally isolated stainless steel hood housing. The Battery management system is mounted at the base. It consists of an insulation (vacuum insulation) hood inside the BatteryPack to maintain the heat, while the outer surface has ambient temperature. The base of each module is designed to accommodate forklift transport for easy mounting into the GridPack.

Altech had updated the design of the 60 KWh battery pack in 2023 to a sleek stainless-steel exterior instead of the previous blue paint. The new stainless-steel finish can withstand extreme temperature variations more effectively while maintaining its pristine appearance. The enhanced design will allow triple stacking using a simple electrical connection, which will enable an effortless "plug and play" setup. Further, the design facilitates parallel or series of connections between each GridPack that will augment operational voltage. The new design will substantially minimize the space occupied by grid storage battery packs and is likely to eliminate the need for separate cooling airflow around the GridPacks, thereby conserving valuable land area.

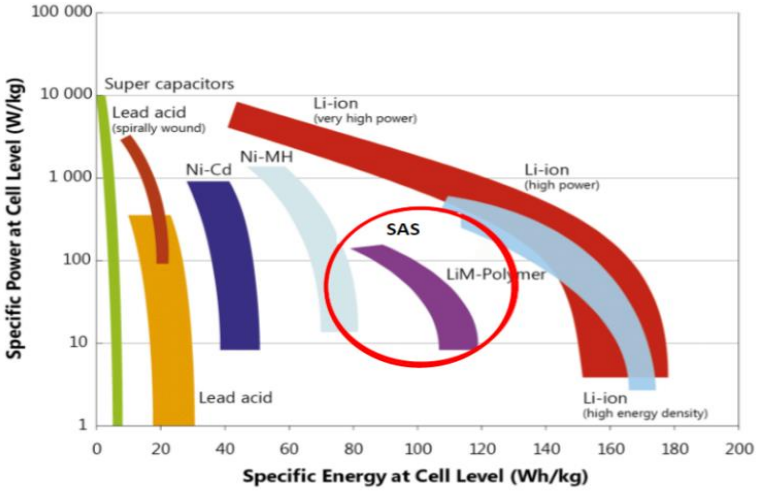
Exhibit 11: Comparison by battery type[xx]

Specifications	ABS60	ABS1000
Battery Type	Battery Pack ABS 60	18 Battery Pack, with controller BMS
Dimension	500 mm x 2,499 mm x 1,145 mm	Open standard high cube 20ft Container of 2.4 m x 5.9 m x <2.7 m
Weight	800 Kg	<17 t
Nominal Voltage (V DC)	600	600
Voltage Range (V DC)	410 – 670	410 – 670
Current Capacity (Ah)	100	100
Discharge Current	Cont. 25A / trans. 33A	Cont. 25A / trans. 33A
Internal Temperature (°C)	270 – 350	270 – 350
Ambient Temperature (°C)	-20 to +60	-20 to +60
IP Rating	IP65	IP65, CE
Nominal Energy Capacity	60 KWh	1 MWh / nominal 1,08 MWh
Operational SoC Range	15%-90% (80%)	15%-90% (80%)
C-Rate	0.16C – 0.33C bi-directional	0.16C – 0.33C bi-directional
C-Rate Power Mode	0.5C for 15 Min.	0.5C for 15 Min.
24h Cycle Capability	Continuous without interruptions	Continuous without interruptions
Cycle Per Day	Up to 3 @ 80%	Up to 3 @ 80%
Design Life (Yrs.)	>15 years	>15 years
Warranty	5 years or 5000 cycles	5 years or 5000 cycles

2.2.1.6 CERENERGY® battery and its target market[xxi]

The CERENERGY® Batteries provide excellent performance in terms of energy and power density. The energy capacity is around 110-130 Wh/Kg as compared to an LFP lithium-ion battery of 90-110 Wh/Kg. The charging and discharging time required for CERENERGY® Batteries is around four to six hours, which makes it ideal for the grid storage market. Contrary to the EV applications, batteries for grid storage do not suffer from mass or volume constraints. As a result, SCSS CERENERGY® batteries are not designed to replace the successful lithium-ion battery but to provide an alternative solution for the stationary storage market or the long-duration energy sector where exceedingly high power in a short period of time is not required.

Exhibit 12: Energy and power curve showing how CERENERGY® batteries are ideally suited to grid storage[xxii]



The global battery energy storage systems market is expected to grow from USD 4.4 bn in 2022 to USD 15.1 bn by 2027. Further, growth is expected from 20GW in 2020 to over 3,000 GW by 2050. CERENERGY batteries can provide a high level of security at low acquisition and operating costs for the stationary energy storage market.

Exhibit 13: Comparison by battery type[xxiii]

Particulars	CERENERGY® Battery	Redox Flow Battery	LFP Battery
Practical Energy Density (Wh/kg)	100-120	10-25	120-160
Energy Conversion Efficiency	80.0-85.0%	70.0%	75.0-80.0%
Cycle Life	>6,000	12,000	3,000 – 5,000
Safety	Very High	High	High
Capex	Low	High	Medium
Operating Temperature (°C)	-40 to +60	Sensitive	+15 to +35
Self-discharge, %/day	0	Small	0.1-0.3
Maintenance Cost, USD/kW	Minimal	28	10

The above table demonstrates the competitiveness shown by a CERENERGY® battery compared with its peers, where – in most cases – the CERENERGY® battery outperforms its peers.

2.2.1.7 Project economics

In March 2024, Altech completed the DFS for the CERENERGY® project with an annual capacity of 120 MWh gridpacks each year. As per the DFS, the project is expected to generate an NPV of EUR 169 mn and net cash flows of EUR 51 mn annually. The IRR is estimated to be 19%, ensuring a capital steady packback period of 3.7 years. At full capacity, the anticipated revenues would be EUR 106 mn. The project is expected to generate EBITDA of EUR 51 mn (EBITDA margin of 47%) even with a small first production line capacity.

Exhibit 14: Capital Costs[xxiv]

Capital Costs	EUR mn
Production Process Equipment	73.0
Building & Infrastructure	59.0
Mobile Equipment & Fit Out	4.6
Plant Electrical & IT Systems	7.4
Contingency	12.0
Total	**156.0**

The capital costs for the project are estimated at EUR 156 mn. The major capital cost component is the construction of the CERENERGY® facility and the associated site infrastructure, such as the administration building, maintenance workshop and on-site QA laboratory. The engineering design and cost estimate for the CERENERGY®

facility have been based on the process design and equipment required to produce 120 MWh GridPacks per annum utilizing equipment design and building layouts specifically developed during the DFS.

2.2.1.8 Suppliers[xxv]

The company has recently announced that it has finalized the following suppliers:

- **Ceramic Mixing Systems:** Altech has appointed Gustav Eirich GmbH (Eirich), who will be providing equipment and technology for granulating salt and nickel, essential for battery cathodes. Eirich has a strong reputation, having worked with Fraunhofer before, thereby making Eirich a trusted partner in Altech's battery plant.
- **Green Ceramic Cell Production:** The company has selected Frey Systeme GmbH (Frey) to provide isostatic machines. These machines will be used for producing green ceramic tubes using alumina powder. Collaboration with Frey's advanced technology will help Altech enable high-speed filling of rubber moulds and applying high pressure to produce green tubes, thereby achieving a production rate of one tube every 45 seconds.
- **Sintered Ceramic Cell Production:** Altech has collaborated with Riedhammer GmbH (Riedhammer), a world-leading German ceramic kiln plant provider. The Riedhammer tunnel kiln is designed to use renewable electricity for heating, which will dramatically reduce the carbon footprint of the CERENERGY® battery.
- **Cell Quality Checks:** The company has engaged Xenon Automation GmbH (Xenon) to implement comprehensive quality checks for completed sintered ceramic tubes, ensuring that there are no cracks or faults. The technology encompasses optical and ultrasonic tests to detect faults. Furthermore, Xenon has designed the initialization process for completed cells, which involves subjecting them to a full charge and discharge cycle.
- **Cell Filling and Assembly**: Altech has appointed Fritz Automation GmbH (Fritz) as a key supplier for the cell assembly plant, encompassing various tasks such as tube cutting and ceramic ring assembly. The advanced automation systems designed by Fritz will ensure efficient and precise execution of each step of the cell assembly process.
- **Battery Connections and Casting:** The company has selected Hofer Powertrain GmbH (Hofer), a leading German supplier of connector plates used for battery busbar connections and wire connections, and König as the supplier for the insulated battery pack cases for the 60 KWh battery packs. That ensures that the exterior remains safe to touch as these battery packs are designed with excellent vacuum insulation. The cases are designed to IP 65 standards, which allow the batteries to operate in all weather conditions.
- **Cell Initialization:** Altech has appointed Dresden Elektronik GmbH for the cell initialization and subsequent performance testing of completed battery cells. The unit is designed to efficiently collect test data and perform charge and full discharge cycles to ensure the proper functioning of the cells.
- **Battery Management Systems:** The company has partnered with IAV GmbH Ingenieurgesellschaft Auto und Verkehr (IAV) to provide an advanced Battery Management System (BMS) design for its 60 KWh battery pack and 1 MWh GridPack. With site panel software control enabling remote operation when connected to customer grid control systems, the BMS will allow seamless integration, thereby ensuring optimal performance and safety of the battery packs and providing users with efficient management and monitoring capabilities. The proposed BMS design also offers remote control capabilities, optimizing energy storage and utilization based on real-time demand and supply dynamics.
- **Plant Electrics and Control Systems:** Altech has appointed Leadec Automation & Engineering GmbH (Leadec) as the contractor to provide advanced electric and automation solutions for the battery plant, which will include intranet-equipped control centers and local operation systems, allowing for centralized monitoring and control of operations. Moreover, a SCADA real-time live system, ensuring real-time data acquisition, visualization and control will be incorporated. Track-and-trace functionality, along with batch identification, will be the key feature of the battery plant. Also, Leadec is the lead engineer for the DFS during the building of the CERENERGY® 100MWh Battery project.
- **Layout, Architecture and Permissions:** The company has partnered with ARIKON Infrastruktur GmbH (Arikon) to design and cost all site buildings and infrastructure on the CERENERGY® battery site. Additionally, Arikon will manage the approvals and permissions for the project with the local and state authorities.

2.2.2 Silumina Anodes™ project

2.2.2.1 Introduction[xxvi]

In November 2021, Altech announced a significant breakthrough in lithium-ion battery technology by its R&D laboratory based in Perth, Western Australia after c. 12 months of research work. This work led to the successful production and testing of a series of lithium-ion battery anode materials that have c. 30% higher retention capacity than conventional lithium-ion battery anode materials through improved cyclability and battery life. This was achieved by combining silicon particles treated with its innovative proprietary technology with regular battery-grade graphite to produce a lithium-ion battery electrode containing a composite graphite/silicon anode.

Since silicon has 10x the energy retention capacity of graphite, it is recognized as the most promising anode material for the next generation of lithium-ion batteries. However, earlier, silicon could not be used in commercial lithium-ion batteries due to some of its critical challenges. Altech's potentially game-changing technology has resolved the challenges and has demonstrated that silicon particles can be modified to overcome their drawbacks. The Silumina Anodes project aims to add high-capacity silicon into the graphite anode of lithium-ion batteries for electric vehicles. The project involves coating silicon with a nanometre layer of alumina, encapsulating the silicon whilst eliminating the swelling and cracking. Altech's lithium-ion battery anode material averaged an energy retention capacity of c. 430 mAh/g, compared to a normal lithium-ion battery anode energy retention capacity of c. 330 mAh/g.

2.2.2.2 Strategic Partnership with Fraunhofer for Silumina Anode™[xxvii]

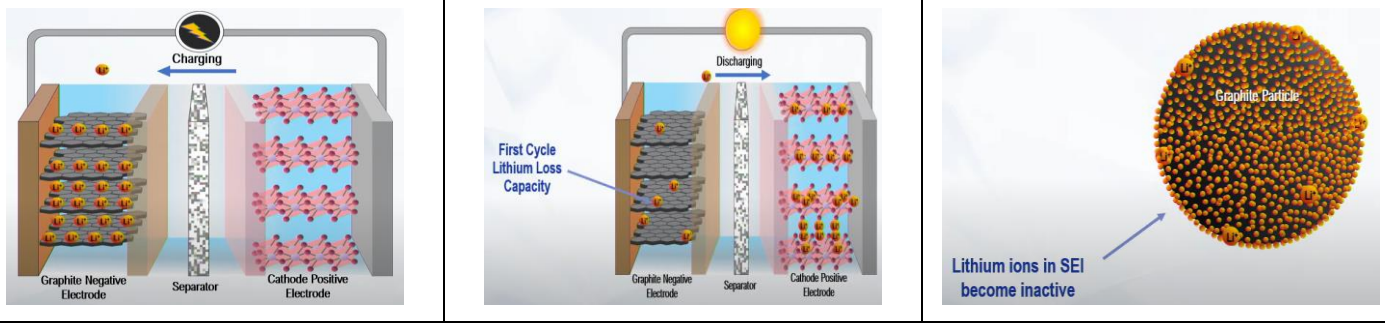
The Company has an agreement with Fraunhofer as a strategic partner to expedite the testing and qualification process for the Silumina Anodes™ product, with the main objective being to test the long-term performance of the Silumina Anodes™ product in different applications, since Fraunhofer has extensive partnerships that will enable the provision of extensive performance testing of various types of battery applications.

2.2.2.3 Challenges of silicon usage in an anode

Although Silicon has been identified as the most promising anode material for the next generation of lithium-ion batteries, the industry has been unable to commercialize silicon into lithium-ion batteries due to the following challenges:

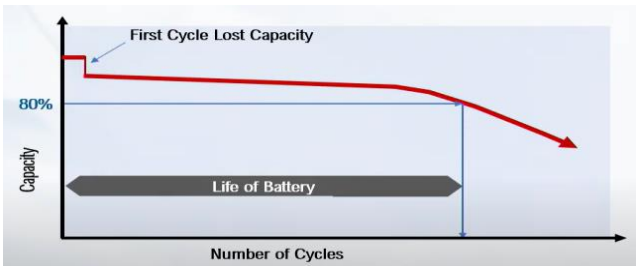
- **Volumetric expansion:** The first major drawback of silicon is its ability to expand up to 300% in volume during battery charge, causing particle swelling, fracturing and ultimately battery failure.
- **First cycle capacity loss:** Commercial lithium-ion batteries use a graphite-based carbon anode. During the charging of the battery, all the lithium ions migrate from the positive end to the negative end, but while discharging, c. 92% of the lithium ions migrate back to the positive end, leaving c. 8% of the lithium ions on the negative end i.e., graphite, and thereby becoming inactive. So, any new lithium-ion battery has c. 92% of the active lithium ions. This phenomenon is called "first cycle capacity loss" or "first-cycle irreversibility".

Exhibit 15: First Cycle Loss[xxviii]



At the molecular level, during a battery's initial lithiation cycle, a solid electrolyte interphase (SEI) forms on the graphite anode surface due to the electrochemical instability of the electrolyte versus lithiated graphite. Also, the electrolyte's contents are lithium phosphate and fluoride, which, during the performance of the battery in the presence of moisture in the electrolyte, lead to the formation of hydrofluoric ions. These hydrofluoric ions break the SEI layer, as a result of which more lithium ions are absorbed, leading to lithium degradation through the battery life.

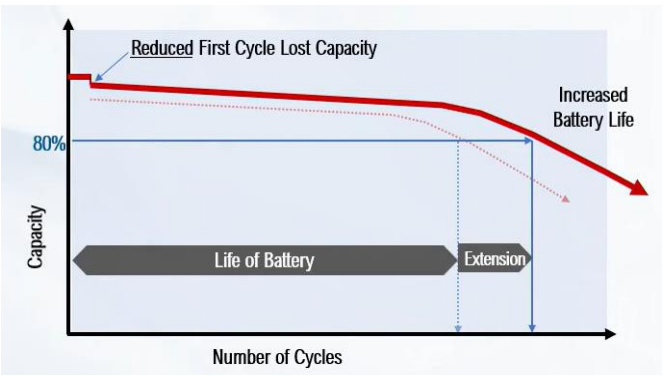
Exhibit 16: Graphical representation of first cycle loss[xxix]



2.2.2.4 Altech's alumina coating technology

Altech Batteries Ltd has developed the technology to nano-coat particles of graphite and silicon, typical of those used in lithium-ion batteries, with a layer of high-purity alumina (HPA). The use of HPA-coated graphite and silicon particles within a lithium-ion battery anode is offered as a solution to increase battery life and energy capacity and to reduce first-cycle capacity loss. HPA is commonly applied as a coating on the separator sheets used within a lithium-ion battery, as alumina-coated separators improve battery performance, durability and overall safety. However, up till now, it was exceedingly difficult for the industry to achieve a cost-effective and consistent nano coating of alumina onto lithium-ion battery-grade anode materials such as silicon and graphite.

Exhibit 17: Potential increased energy density & extra battery life[xxx]



Altech needs to carefully refine its coating technology, especially in the case of Silicon, to achieve the application of the desired thin and consistent layer of alumina. The Company has patented this alumina coating technology as "Silumina Anodes™". The Company has further demonstrated the potential impact on battery life, which is estimated[xxxi] to increase by 20-30%, and on energy density, which has shown a potential increase of 8%. This was achieved through an increase in the amount of metallurgical Silicon incorporated into a lithium-ion battery, which translated into increased distance from a single charge. This has significant cost reduction implications for battery and car manufacturers.

Exhibit 18: Altech HPA coating[xxxii]

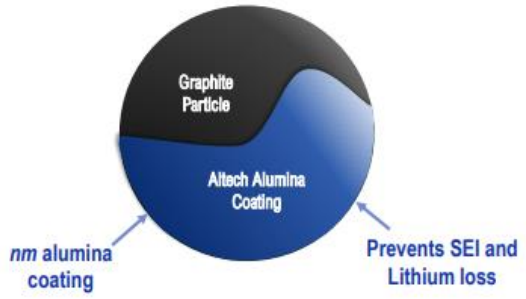
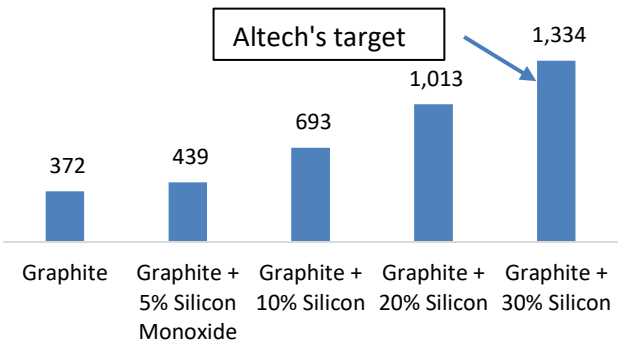


Exhibit 19: Altech's target silicon content in composites[xxxiii]



As a result, there is an evolving use for alumina within the anode component of lithium-ion batteries because of the favorable impact that alumina-coated graphite/silicon particles have on battery life and performance.

2.2.2.5 Feedstock suppliers[xxxiv]

Altech has signed the following two Memorandum of Understanding (MoU) with two Europe-based suppliers of lithium-ion battery-grade anode materials:

- The Company has executed a non-binding MoU with SGL Carbon GmbH (SGL), one of the leading producers of graphite in Europe, with a potential future relationship whereby SGL would supply uncoated synthetic graphite anode material to AIG's battery materials plant in Saxony.
- The Company also has a non-binding MoU with Ferroglobe, a leading producer of high-purity metallurgical silicon in Europe. The executed non-binding MoU details the relationship whereby Ferroglobe would supply Silicon anode material to AIG's Silumina Anode™ plant in Saxony. Ferroglobe is a leading producer of Silicon metal with a proven ability to create new solutions and applications using state-of-the-art technology to drive innovation. It has technologies to produce high-purity grade silicon and is specifically developing tailor-made Silicon powders for lithium-ion battery anodes.

By securing high-quality graphite and silicon from these leading Europe-based materials suppliers, transport emissions attributed to feedstock shipments are reduced and supplier production facilities have the potential to utilize the extensive green electricity market in Europe. Importantly, the selection of EU-based feedstock suppliers is expected to reduce any potential future supply-chain risks compared to non-European suppliers.

2.2.2.6 Plant location and layout[xxxv]

The company has a 14-hectare industrial site within the Schwarze Pumpe Industrial Park in Saxony, Germany, for the battery materials project. The Schwarze Pumpe Industrial Park is located in north-eastern Saxony and is well-serviced by existing infrastructure. The industrial park is 120 km from Berlin and 78 km from Dresden, which is considered the new automotive nucleus in Europe, and which houses production sites for reputable OEMs like Volkswagen, BMW, Porsche, Daimler and Tesla, as well as several key resource and technology players within the value chain of lithium-ion batteries. It is thus highly strategic to the European lithium-ion battery and EV market.

The 14-hectare industrial site will house a battery materials coating pilot plant, as well as a proposed 8,000 tpa battery materials project, designed to produce Altech's silicon graphite anodes using its proprietary HPA coating technology. The design of the proposed 8,000 tpa Silumina Anodes™ plant incorporates one main production building and three ancillary buildings, which include administration and engineering, maintenance workshop and stores and guardhouse buildings.

Altech has appointed German engineering firm Kuttner GmbH & Co KG (now hatch) to construct the pilot plant in Germany, which will demonstrate Altech's proprietary battery materials alumina coating technology. The pilot plant design has been divided into:

- Precursor production, which will be operated in batch mode, produces approximately 10kg per batch.
- Coating & Calcination, which has been designed to operate continuously with minimal shutdowns to ensure consistency in the product material.

The company is on track for the implementation of its pilot plant in an existing building in Dock3 at Schwarze Pumpe. The pilot plant's primary objective is to support the qualification process for the Silumina Anodes product and is designed to produce up to 120 kg per day of anode-grade coated battery material per year, i.e., 120 kg per day. This will be made available to selected European and US battery manufacturers and auto-makers.

An on-site laboratory has been established and fully commissioned to assess product purity and monitor physical parameters. The laboratory enables Altech to conduct necessary testing and analysis of the Silumina Anodes product from the pilot plant. Additionally, Altech established an on-site glove box, which facilitates the production of lithium-ion battery coin half cells. These half-cells will be used to test the performance of the Silumina Anodes produced from the pilot plant. This is a crucial component of the product qualification process and will provide important data on the product's performance characteristics.

Exhibit 20: Pilot Plant building modifications and electrical panel infrastructure construction[xxxvi]

Exhibit 21: Pilot Plant electrical board and various equipment[xxxvii]

2.2.2.7 Pouch Cell Batteries[xxxix]

Altech has expanded its R&D Laboratories to allow production of pouch cell size batteries. With the game-changing breakthrough achieved by using alumina-coated silicon in a graphite anode, resulting in higher energy capacity and increased cyclability, the battery performance testing was conducted with industry-standard coin cell rechargeable lithium-ion batteries. Because of potential size limitations, the cell chemistry is first optimized in smaller format coin cells and then progressively scaled up to full-sized pouch cells. This provides more information on electrochemical performance, energy density, and safety. In order to access anode material against EV application targets, a scale-up from coin cell to pouch cell is required.

Exhibit 22: Pouch Cell[xxxviii]

The pouch cell, a common design for a lithium-ion battery, is in a vacuum-packed thin plate shape in which many layers of thin cathode and anode electrodes are arranged. Conductive foil tabs welded to the electrode and sealed to the pouch carry the positive and negative terminals to the outside. The pouch cell pack design is used in current consumer, military, and automotive applications. The company decided to expand its R&D lab for its pouch cell development. As a result, Altech installed and commissioned a larger-scale tube furnace in its R&D Laboratories in Perth, having the capability to calcine 1.0 kg samples per batch.

2.2.2.8 Project Economics[xl]

The DFS has expanded the project's output capacity eightfold, increasing it from 15 GWh to 120 GWh, without any significant change in the plant and equipment costs. This will enable the company to cater to the long-term demand for silicon-type anodes. Initially, Altech had proposed the production of 10,000 tpa of Silumina Anodes product, comprising 1,000 tpa of high-purity alumina-coated metallurgical silicon incorporated into 9,000 tpa of similarly coated graphite (10% mix). However, now the plant will focus solely on producing alumina-coated metallurgical silicon product at a rate of 8,000 tpa, which will be integrated into the uncoated graphite source by the customers within their battery plants rather than at Altech's facility. Given the increasing demand for high-density batteries and need to reduce reliance on graphite (due to export restrictions by China), Altech's alumina-coated silicon anodes will serve as a natural substitute for the industry.

Exhibit 23: DFS summary[xli]	
Production	8,000 tonnes
Exchange Rate	0.91 EUR/USD
Pre-tax NPV	EUR 684.8 mn
Discount rate	10.0%
IRR (from construction start)	34.6%
Payback period	2.4 Years
Total revenue p.a.	EUR 328 mn
Annual EBITDA	EUR 105.6 mn per annum
Project Capex	EUR 112.5 mn
Operating costs p.a.	EUR 222.4 mn
EBITDA Margin	32%

In December 2023, Altech completed the DFS for its 8,000 tpa Silumina Anode™ battery materials coating plant in Germany. The study showed robust and attractive economics with a high-margin, high-value proposition and a relatively low level of capital investment. With a capital investment of c. EUR 112 mn, the company estimates a project NPV of c. EUR 684.8 mn (discount rate of 10.0%), with EBITDA of EUR 105.6 mn per annum generated from operations. The company estimates an IRR of 34.6% (from construction start), with a pay-back period of 2.4 years. The total annual revenue at 8,000 tpa is estimated to be EUR 328 mn per annum, with a EBITDA margin of 32.1%. The total operating cost of the project is estimated to be EUR 222.4 mn per annum at the full production rate and the life of the project is taken to be 30 years, typical of chemical processing plants.

2.2.2.9 Financing[xlii]

According to the DFS, the project financing will be multi-faceted through grant applications, debt and green bond financing processes. The grant process will include:

- Saxony State Government Grant: State employment grants for the maximum sum of EUR 7.48 mn.
- Federal German Government Grants: Environmental and/or Federal Technology Grants or R&D Grants up to EUR 15 mn and Federal investment funding for special projects referred to as 'Resilience and Sustainability of the Battery Cell Manufacturing Ecosystem' up to EUR 50 mn through Kreditanstalt für Wiederaufbau with 50% government guarantee.
- European Government Grants: Funding up to EUR 50 mn is available only for expanding capacity beyond the 8,000 tpa limit.

Altech is also in discussions with European banks, including the European Investment Bank (EIB), regarding debt financing of the Silumina Anode™ project. The company is also considering debt via the green bond capital market and has advisers working on this process.

2.2.2.10 Recent Project Development[xliii]

Altech has begun building a pilot plant close to the proposed project site to help the qualifying process for its Silumina Anodes™ product as it strives to bring its patented technology to market. The initial phase of the pilot plant, referred to as the wet circuit, is advancing well. Achievements include the completion of power supply enhancements, laboratory setup, building modifications and front-end wet circuit infrastructure. Docked at Schwarze Pumpe, Germany, the pilot plant occupies an existing structure in Dock 3. The preceding quarter witnessed the fulfillment of necessary building adjustments and electrical panel infrastructure establishment.

The on-site laboratory is now operational and fully commissioned. This significant advancement empowers Altech to perform vital assessments and analyses on the Silumina Anodes™ product. Furthermore, the company has introduced an on-site glove box, streamlining the production of lithium-ion battery coin half cells. These cells will be pivotal in evaluating the performance of Silumina Anodes™ derived from the pilot plant, an essential facet of the product qualification process. This endeavor will yield crucial insights into the product's performance traits. The plant

is expected to produce 120 Kg/day coated battery anode material, which will be available to selected European and US battery manufacturers and auto-makers.

Simultaneously, the pilot plant's back end is being constructed in South Africa and Europe. This phase encompasses coating equipment, a dryer and a calciner, which have longer lead times. To expedite progress, Altech is fast-tracking the production of certain back-end components, such as silicon carbide linings.

2.3 Environmental, Social and Governance (ESG) Report

In September 2023, Altech released its first ESG Report which encompasses 4 key categories – Principles of Governance, People, Planet and Prosperity. These subjects are reported through 21 core metrics tracked by Altech, which is reviewed annually and quarterly.

1) **Principles of Governance**

- *Purpose* – Altech's purpose is to revolutionize energy storage and battery materials to support the energy transition from a fossil fuel carbon-based economy to a renewable energy economy. It aims to achieve this through the commercialization of its CERENERGY solid state batteries, and silicon-graphite anodes for higher energy density EV batteries.
- *Body Composition* – The company recognizes the importance of ESG competencies and seeks to have directors with experience and knowledge on ESG matters to help guide the company in meeting its sustainability goals. As of September 2023, Altech's Board was made up of 6 Members (+1 Alternate Director), where all members were males. Of this board, 67% were local directors (Australian) and 33% were of overseas origin. The Board had 83% (5) non-executive directors, and the remaining 17% were independent directors. Lastly, all directors were in the 50+ age group.
- *Stakeholder Management* – Altech uses stakeholder mapping to identify its stakeholders and understand their needs and interests by engaging in regular stakeholder consultations to gather feedback and ensure addressing material issues.
- *Ethical Behavior* – The company does not have anti-corruption training but is committed to fighting corruption through initiatives such as the Code of Conduct, the Anti-bribery and Corruption Policy and the Whistleblower Policy.
- *Risk and Opportunity Oversight* – The company's risk profile contains both financial and non-financial factors and to mitigate them Altech intends to put in place a risk management policy including Board meetings, bi-annual financial and internal audits, rigorous appraisal of new investments, advisers familiar with the company and an internal audit function.

2) Planet

- *Climate Change* – Altech is committed to measuring, reporting, and reducing GHG emissions in line with industry practices. The company's "Battery Materials Coating" plant in Germany has been awarded as "Medium Green" rating by the independent Centre of International Climate and Environmental Research (CICERO). Moreover, Altech's Malaysia HPA processing plant aims to be one of the world's leading suppliers of HPA to produce LED and lithium-ion batteries. Feedstock for the HPA plant will be sourced from Altech's 100%-owned kaolin deposit at Heckerling, Western Australia. Altech also commissioned a CICERO Green Bond report for this project, and it received a 'Light Green' rating.
- *Nature Loss* – The company is committed to using land in a responsible manner for all its operations and strives to minimize the environmental footprint. Altech is developing an Environmental Management System (EMS), which is expected to be certified under the ISO 14001 standard before the plant starts operations. Also, the management team will review environmental compliance bi-annually. The company's project follows international environmental regulations such as the Equator Principles and International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability.
- *Freshwater Availability* – Altech plans to neutralize and filter wastewater generated from "Battery Materials Coating" Plant, Germany before discharging into the Schwarze Pumpe Industrial Park's drainage system. For its Kaolin Project, Australia, the company is considering third party processors in Asia who will take bulk as mined kaolin, or dry coarsely screened kaolin or Kerrigan kaolin could be dry screened at 300 microns for use as feedstock for HPA plant. These developments will reduce water consumption for kaolin processing.
- *Task Force on Climate-Related Financial Disclosures (TCFD)* – The company has not started implementing the TCFD recommendations, as it presently optional in Australia, but it is considering doing it in future. However, based on the overall assessment by CICERO, Altech's green bond framework receives a CICERO medium green shading and a governance score of "Good" for all its projects.

3) People

- *Diversity and Equality* – Altech has a diverse set of employees and directors due to its presence in three countries i.e., Australia, Germany, and Malaysia. The Board of Altech is committed to evaluate the adoption of a Diversity Policy. Presently, Altech does not collect diversity data of its employees but will report on diversity related data as and when the company expands.
- *Health and Well-being* – The company has mandated that all its employees must complete government mandated safety training prior to entering the site and must follow the training modules for their own safety as well as those around them.
- *Training* – Altech does not report on training expenditures or hours as of now. It will revisit and disclose such information as and when the need arises.
- *Pay Equality* – The company currently does not report on the ratio of basic salary and remuneration of its employees. However, it facilitates equal employment opportunities based on relative ability, performance or potential. The company has established a Remuneration Committee which has four members comprising the Non-Executive Chairman, two Non-Executive Directors, and the Managing Director.
- *Wage Level* – Given the limited scope of operations and relatively small size of the organization, Altech does not disclose the wage levels of its employees.
- *Child, Forced or Compulsory labor* – Altech adheres to applicable laws and regulations pertaining to modern slavery in all the countries of its operations. While there are potential risks of modern slavery in Malaysia, the potential risk of modern slavery in Australia and Germany is very low. It has not conducted a formal risk assessment on modern slavery but will consider reviewing this decision for responsible business practices.

4) Prosperity

- *Employment and Wealth generation* – As of June 30, 2023, Altech had 19 employees and it utilizes external consultants and contractors as and when required. The company does not provide a detailed disclosure related to its staff turnover, or new hired staff but will reassess in future ESG reporting.
- *Innovation of products and services* – Altech established a dedicated R&D laboratory in Perth, Australia, and has produced the Silumina Anodes lithium-ion battery anode material with 30% higher energy retention and capacity than conventional graphite only anodes. Altech has also entered a strategic partnership with German Battery R&D institute Fraunhofer IKTS for Silumina Anodes qualification.
- *Community and social viability* – Altech has disclosed total tax paid in the Annual Financial Report for FY 2022.
- *Employment and Wealth generation*
  - Economic Contribution – Altech did not receive any financial aid from government bodies for the FY 2022.
  - Financial Investment Contribution – Altech has not paid any dividends for the FY 2022 and no dividend is recommended for the current year i.e., FY 2023.
  - There is currently no on-market buyback program for any of Altech's listed securities.

2.4 Financial Overview

For H1 2024, Altech reported a total income of AUD 174.8k compared with AUD 236.7k for the corresponding period in the previous year. Of this, 63% was contributed by interest income, while the remaining was attributed to R&D tax refunds and other income. The company booked employee benefit costs of AUD 3.6 mn and R&D expenses of AUD 3.6 mn during the period, accounting for most of the company's operating costs. In addition, Altech booked a loss on investment in AAM AG of AUD 7.4 mn during H1 2024, compared with a profit of AUD 1.5 mn in the corresponding period in the previous year.

At the end of H1 2024, the company's cash and cash equivalents stood at AUD 9.3 mn, while its loans payable stood at AUD 7.6 mn. In May 2024, Altech raised USD 3.72 mn under its SPP for 57.2 mn shares at AUD 0.065 per share. The proceeds will be utilized to produce the ABS 60kWh BatteryPack prototypes and finance the construction of the pilot plant at Saxony.

2.5 Business Strategy[xliv]

The business strategy around the projects is as follows:

Exhibit 24: Project wise business strategy[xlv]

CERENERGY® Battery Project	Silumina Anodes™ Project
•Arrange for end-Users •Sign 100.0% offtake agreements •Complete BFS •Raise capital via different routes •Build 100 MWh plant •Build Gigawatt battery facility in Saxony	•Sample prodution from its Pilot Plant and sending to different OEMs •Sign offtake agreements •Raise capital via different routes •Construction of 10,000 tpa Silumina Anode™ battery materials coating plant in Germany

2.6 Outlook[xlvi]

CERENERGY® Battery Project:

Altech recently completed its SPP, raising AUD 3.72 mn for 57.2mn shares at AUD 0.065 per share in May 2024. The proceeds will be used to complete the production of the ABS 60KWh prototype of CERENERGY BatteryPacks for customer testing to secure offtake agreements with customers. All prototype materials have been procured from specific suppliers, and all components have been fabricated. The welding of these cells into the CCS is underway, after which five completed battery modules will be delivered to Fraunhofer IKTS in Dresden. The five modules will be mounted together, and the first ABS 60kWh prototype will be completed. Once the prototype is complete, it will be available for demonstration to potential customers to test it for practical applications and benefits of the ABS60 series in various industries. This will enable Altech to secure long-term off-take agreements, thereby commercializing the BatteryPacks.

Further, Altech completed the DFS for its CERENERGY project earlier this year, improving the project economics significantly. With a strong end-market growth (grid storage market at 28% CAGR), Altech plans to proceed to the funding phase (Final Investment Decision) for this project, after which the company will begin plant construction. The funding and construction phase is expected to take 18-24 months to complete.

Silumina Anodes™ Project:

At the end of 2023, Altech expanded the Silumina Anodes project's output capacity from 15 GWh to 120 GWh without significantly changing plant and equipment costs. Further, the plant will now focus solely on producing alumina-coated metallurgical silicon products at a rate of 8,000 tpa, enabling the company to cater to the long-term demand for silicon-type anodes, given the increasing demand for high-density batteries and the need to reduce reliance on graphite, due to export restrictions by China.

Accordingly, Altech has signed an MoU with Ferroglobe, Altech's European silicon partner, to help increase the project's supply of metallurgical silicon. Moreover, the company has executed non-disclosure agreements (NDAs) with prominent automotive conglomerates in Europe and the US, who are willing to acquire commercial samples for their testing and qualification processes. The samples will be procured from the pilot plant in Saxony, which is nearing completion and is expected to be operational in FY 2024. The company will be utilizing the funds from its recent SPP to construct the pilot plant.

2.7 Company Milestones

Exhibit 25: Altech Batteries' milestone timelines[xlvii]	
Year/ Period	**Event**
2017	• Announced dual listing on Frankfurt Stock Exchange under the symbol "A3Y" • Raised AUD 2.0 mn from MAA Group Berhad via share placement • Raised USD 1.85 mn via Share Purchase Plan (SPP) and placement • Raised AUD 17.2 mn from a share placement, which includes AUD 5.1 mn from SMS Group Gmbh and AUD 3.0 mn from Melewar Group • Raised USD 11.0 mn from SMS Group Gmbh via equity support
2018	• Raised AUD 4.3 mn via SPP
2019	• Raised AUD 18.0 mn via share placement • Announced approval of Altech Advanced Materials AG (AAM) capital increase prospectus of c. USD 100.0 mn
2020	• Raised USD 2.8 mn via SPP • Announced test work program with FRAUNHOFER • Initiated listed green bond project funding option for c. USD 100.0 mn for a five-year period • Received AUD 12.2 mn of Grant Support from Saxony State Government • Announced the appointment of Mr. Hansjoerg Plaggemars as a non-executive director • Announced sale of 25.0% of AIG for AUD 8.3 mn to Frankfurt Stock Exchange • Raised USD 12.5 mn in a rights issue
2021	• Commenced Pre-feasibility Study (PFS) for HPA coating plant in Saxony, Germany • Appointed Mr. Martin Stein as chief financial officer following the resignation of Mr. Shane Volk • Received Green Status for Battery Materials Coating Plant • Announced "cracking of Silicon Barrier" with 30.0% higher energy density anode achieved in lithium-ion battery • Raised USD 8.1 mn via SPP to advance battery materials development • Signed MoUs with SGL Carbon GmbH and Ferroglobe Innovation S.L. for supply of feedstock
2022	• Acquired 14 Ha industrial site in Saxony, Germany • Launched and registered the product name Silumina Anodes™ for alumina-coated anode • Completed Battery Materials Pilot Plant Design and appointed Küttner GmbH & Co. KG • Announced result of PFS for Silumina Anodes™ Plant and filed for patent for Silumina Anode™ technology • Announced strategic partnership with FRAUNHOFER for Silumina Anode™ Technology • Announced JV with FRAUNHOFER to commercialize CERENERGY® SCSS Battery • Appointed Leadec Automation & Engineering GmbH for the Cerenergy®100 MWh project • Launched ABS60 60 KWh sodium alumina solid state battery pack design • Announced proposal for change of Company name to "Altech Batteries Limited" with ASX symbol as 'ATC'

2023	• Announced finalization of design for 100 MWh CERENERGY® project • Appointed ARIKON Infrastruktur GmbH (Arikon) for managing approval related process, site infrastructure requirements, and balance of plant for the CERENERGY® battery facility • Announced the change of Company name to "Altech Batteries Limited" with ASX symbol as 'ATC' • Announced the launch of ABS1000 Grid pack design for Renewable energy storage market. • Raised c. AUD 15.8 mn through private placement and entitlement offer to further progress the CERENERGY and Silumina Anodes Projects • Finalized preliminary battery specifications for its ABS60 and ABS1000 Grid Pack battery products • Announced production of two prototypes of the 60 KWh (ABS60) battery pack at Fraunhofer IKTS facility in Hermsdorf, Germany • Appointed CICERO for green accreditation of the CERENERGY® battery and project • Commenced permitting and licensing application process for the CERENERGY® battery project • Optimized the design of 60 KWh battery pack into a sleek stainless-steel exterior; First stainless-steel battery case delivered – undergoing heat loss testing • Increased output capacity of CERENERGY® from 100 MWh to 120 MWh per annum through design optimization • Output of Silumia Anodes™ project increased 8-fold to 120 GWh without any change in the plant and equipment costs • Announced results from the DFS of Silumina Anodes project with post-tax NPV of EUR 684 mn at 10% discount rate, IRR (from start of construction) of 34% with a payback period of 2.4 years
2024	• Received the final instalment of EUR 1.58mn from the sale of 25% of Altech's subsidiary Altech Industries Germany GmbH • Raised AUD 3.72 mn under the SPP for 57.2mn shares at AUD 0.065 per share in May 2024

2.8 Company Premiums[xlviii]

a) Large addressable market with strong growth potential: Altech, with its flagship CERENERGY® battery project, has specifically focused on the grid (stationary) energy storage market, which is projected[xlix] to grow by a 28.0% CAGR in the coming decades. The global grid energy storage market is expected[l] to grow from USD 4.4 bn in 2022 to USD 15.1 bn by 2027. The Company also has a Silumina Anodes™ project, which can act as a substitute for graphite/silicon anode used in EV, and with the sustained policy support from governments worldwide to decarbonize road transport and increase its efficiency, the lithium-ion (Li-ion) battery capacity market is expected[li] to grow at a CAGR of 26.0% from 2020 to 2025, thereby demonstrating the gigantic opportunity for the Company going forward.

b) JV with a partner of repute: Altech has entered into a JV with Fraunhofer IKTS ("Fraunhofer") to commercialize the Sodium Alumina Solid State (SCSS) Battery. Founded in 1949, the Fraunhofer-Gesellschaft based in Germany is the world's leading applied research organization. Prioritizing key future-relevant technologies and commercializing its findings in business and industry, it plays a major role in the innovation process. The Fraunhofer-Gesellschaft currently operates 76 institutes and research units with more than 30,000 employees throughout Germany. Fraunhofer Institute for Ceramic Technologies and Systems is one of the 76 institutes and conducts applied research on high-performance ceramics. The institute's three sites in Dresden and Hermsdorf (Thuringia), Germany, collectively represent Europe's largest R&D institute dedicated to the study of ceramics. As a research and technology service provider, the Fraunhofer IKTS develops advanced high-performance ceramic materials and industrial manufacturing processes, as well as prototyping components and systems in complete production lines up to the pilot-plant scale. The development of CERENERGY® technology is a testimony to Fraunhofer's ability to revolutionize previous technology, allowing higher energy capacity and lower production costs. The most famous innovation of Fraunhofer is the MP3 digital audio coding format in 1991.

c) Disruptive technology: Until recently, the industry faced continuous unresolved obstacles when using silicon in lithium-ion battery anodes like silicon particle swelling, first-cycle capacity loss of up to 50%, and rapid battery degradation. But Altech Batteries Ltd. Finally "cracked the silicon barrier" and successfully produced and tested a series of lithium-ion battery anode materials that have c. 30% higher retention capacity compared to conventional lithium-ion battery anode materials. It did this by combining silicon particles with its innovative proprietary HPA coating technology. Altech's potentially game-changing technology has demonstrated that silicon particles can be modified to resolve the capacity fading caused by both the swelling and first-cycle capacity loss problems.

d) Significant government assistance: There is a significant increase in investment in Saxony because of a supportive government and regulatory framework. In 2020, the Saxony State Government in Germany offered strong support by committing a grant of AUD 12.2 mn to Altech for the construction of its Silumina plant at the

Schwarze Pumpe Industrial Park, which houses major global OEMs, in the State of Saxony, Germany, thereby creating a conducive environment for the Company to work in.

2.9 Company Risks[lii]

a) Financial risks: The Company is still in the pre-revenue stage. It faces financial hurdles such as the availability of capital, excessive operational and capital costs, and cost overruns due to unexpected problems and delays. The Company requires financing to meet its corporate expenses and for the construction of production facilities. While it has raised the required financing in the past, it is plausible that the Company might not be able to meet its requirements in the future, due to unpredictable circumstances such as adverse market conditions, economic down-turns and commodity price volatility. Failure to secure the required funds might result in the delay or indefinite postponement of the project.

b) Regulatory risks: The Company is still at the pre-revenue stage. The Company's business is subject to various national and local laws and regulations relating to the production, marketing, pricing, transportation and storage of the Company's products, in each of the countries in which the Company operates or may operate. Permits from a variety of regulatory authorities may be required for aspects of the Company's operations. However, any amendments to existing laws or the imposition of new laws may have a material adverse effect on the Company's proposed business and financial condition.

c) Supply-side risks: The Company is dependent on SGL Carbon GmbH and Ferroglobe Innovation S.L for the supply of graphite and silicon anode materials for its Silumina Anodes™ Project in Saxony, Germany, which poses significant supply risk as any adverse developments in the business environments of its suppliers may lead to a disruption of services of supplies, thereby creating an adverse impact not only on the financial performance of the Company but also on the reputation of the business for fulfilling its obligations.

d) Competition risks: Altech is a specialty battery material technology and research & development Company with a specific focus on downstream battery market development through its innovative technologies. The quick electrification of the world has led to a meteoric rise in new technologies. So, it is plausible that Altech might face severe competition from new players entering the market using its new innovative technology with lower cost structures, thereby gaining market share. Also, by the time the Company offers the product, the market may already have an alternative product similar to Altech's at a cheaper cost, thereby hampering the Company's growth plans and strategies going forward

2.10 Shareholding Pattern[liii]

The Company had 1,710,571,924 shares of common stock issued and outstanding on July 23, 2024. The shareholding pattern is as follows:

Exhibit 26: Top shareholding pattern (July 23, 2024)

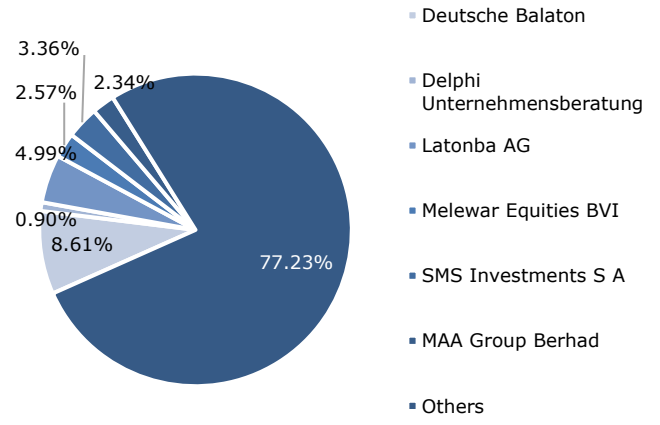


Exhibit 27: Top shareholding pattern (July 23, 2024)

Shareholders	Shares outstanding
Deutsche Balaton	147,270,075
Delphi Unternehmensberatung	15,380,224
Latonba AG	85,357,539
Melewar Equities BVI	44,038,984
SMS Investments S A	57,418,528
MAA Group Berhad	39,995,541
Others	1,321,111,033
Total	**1,710,571,924**

2.11 Listing and Contact Details

Altech Batteries Limited is publicly listed on the Australian Stock Exchange (ASX) and is traded under the symbol 'ATC'. It is also listed on the Frankfurt Stock Exchange (FRA) under the symbol 'A3Y'.

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3. News[liv]

- **Update on CERENERGY ABS60 BatteryPack prototypes:** On July 16, 2024, Altech announced that all the 240 cells for the first ABS60 BatteryPack prototype had been fabricated, assembled and initialized at Fraunhofer IKTS Hermsdorf's pilot plant. All the cells had undergone quality checks by Fraunhofer, delivering better-than-expected capacity. After this, the modules containing the cells were shipped to the laboratory for welding onto the CCS. After welding, the modules will be shipped to Fraunhofer IKTS, Dresden, where all five modules will be mounted into the ABS60 BatteryPack, and the Prototype will be completed. This will allow testing and demonstration by potential customers, to prove individual use cases.
- **Appointment of KPMG as Adviser for CERENERGY Financing Phase:** On June 14, 2024, Altech appointed global corporate advisory firm KPMG to assist in securing finance to construct the 120MWh CERENERGY® battery plant in Germany. KPMG will be the company's financial adviser on potential financing transactions and provide service on public grants or subsidy programs, as the company is keen on securing offtake agreements for the project and sourcing funds to construct the plant.
- **Results of Share Purchase Plan:** On May 21, 2024, Altech announced that it had closed the SPP on May 5, 2024. The company received applications from eligible shareholders of USD 3.72 mn, representing 57.2 mn shares at USD 0.065 per share and 28.6 mn free-attaching options at an exercise price of USD 0.08 per share, expiring on April 30, 2026. The shares and options were issued and allotted on May 21, 2024.
- **Extension of Share Purchase Plan Closing Date:** On May 3, 2024, Altech announced that it had revised the closing date for the SPP to May 15, 2024, from May 8, 2024. The announcement of the results was also revised to May 22, 2024, from May 15, 2024.
- **Launch of Share Purchase Plan:** On April 17, 2024, Altech launched its SPP to raise up to AUD 5mn. The SPP offer will provide each eligible shareholder with the opportunity to subscribe for up to AUD 30,000 in new fully paid ordinary shares in the company, subject to any scale back, at an issue price of AUD 0.065 per new share. Eligible shareholders who apply for the SPP shares will receive one free-attaching option for every two new shares subscribed at an option exercise price of AUD 0.08, expiring on April 30, 2026.
- **DFS for 120 MWh first production line CERENERGY battery project:** On March 20, 2024, Altech announced excellent results from a DFS conducted for its CERENERGY project with an annual capacity of 120 MWh gridpacks each year. As per the DFS, with a capex investment of EUR 156 mn, the project is expected to generate an NPV of EUR 169 mn and net cash flows of EUR 51mn annually. The IRR is estimated to be 19%, with a packback period of 3.7 years. At full capacity, the anticipated revenues would be EUR 106mn. The project is expected to generate EBITDA of EUR 51mn (EBITDA margin of 47%) even with a small first production line capacity.
- **Progress on ABS60 60 kWh CERENERGY® battery prototypes:** On February 6, 2024, Altech Batteries announced significant progress on the development of ABS60 60 kWh CERENERGY® battery prototypes. The pilot line at Fraunhofer IKTS underwent a comprehensive redesign to facilitate the manufacturing of 60 kWh battery prototypes. Specific tools were developed to produce the battery cells required for the 60 kWh prototypes. The battery pack consisted of 240 CERENERGY® cells, each rated at 2.5 V. Additionally, Fraunhofer IKTS's pilot plant facility had navigated entire ceramic tube production, with half already manufactured. The assembly of cells would be undertaken once all cells had been finalized and completed by the middle of 2024.
- **Additional information on Silumina Project DFS announced:** On January 11, 2024, Altech announced additional information on Silumina Project DFS. The project's funding would be multifaceted, comprising funding from grant applications, debt and a green bond financing process. The total operating costs of the project would be EUR 222.4 mn per annum at the full production rate. Additionally, the project's life would be 30 years, typical of chemical processing plants.
- **Funds Received from the sale of 25% of Altech's subsidiary AIG:** On January 8, 2024, the company announced it had received EUR 1.58 mn in the final installment of Deferred Consideration from AAM. In December 2020, Altech finalized the sale of 25% of its German subsidiary AIG for EUR 5 mn. An initial consideration of EUR 250K was paid upon the signing of the Share Sale and Purchase Agreement with a remaining deferred consideration of EUR 4.75 mn to be paid in three equal installments of EUR 1.58 mn.
- **Results from highly positive Silumina Project DFS announced:** On December 21, 2023, Altech announced the results of the DFS conducted for Silumina Anodes™ project, an alumina-coated metallurgical silicon plant in Saxony, Germany. Altech's DFS projects an NPV of EUR 684.8 mn, and EUR 105 mn of net cash would be generated from the operations. The project's IRR would be estimated at 34%, and payback would be 2.4 years. Total revenue at the maximum production rate of 8,000tpa would be EUR 328 mn per annum. The capital cost for the project was estimated to be EUR 112.5 mn. It would include the construction of the Silumina Anodes™ facility and the associated site infrastructure, such as the administration building, maintenance workshop and on-site QA laboratory. Moreover, the company is in the final stages of constructing a pilot plant in an existing building in Dock3 at Schwarze Pumpe.
- **Silumina Project DFS Expands Output 8-Fold from 15 GWh to 120 GWh:** On November 14, 2023, Altech announced that it has expanded the output capacity of the Silumina Anodes™ project by eightfold, increasing it from 15 GWh to 120 GWh, with no significant change in the plant and equipment costs. While Altech had initially proposed to produce 10,000 tpa of Silumina Anodes product, the plant will now focus solely on producing

alumina-coated metallurgical silicon product at a rate of 8,000 tpa. This product will be integrated into the uncoated graphite by the customers within their battery plants rather than at Altech's facility.

- **Cerenergy Battery Project Upgraded DFS Output to 120 MWh per annum:** On November 3, 2023, Altech Batteries successfully increased the output capacity of the CERENERGY® project from 100 MWh to 120 MWh per annum through technical design optimization. On reviewing the equipment, the engineering company found that most of the equipment sizes were standard off-the-shelf capacities, offering ample additional capacity, which could result in higher output from the project.
- **Optimized design of Cerenergy Battery packs completed for DFS:** On October 24, 2023, Altech announced that it has optimized the design of its 60KWh battery pack following final design collaborations with component suppliers. The 60 KWh battery pack design will now have a sleek stainless-steel exterior with the prominent CERENERGY® logo on top and "ALTECH Batteries" engraved at the bottom. The stainless-steel finish will have a better ability to endure extreme temperature variations, be it in snowy or desert conditions, while maintaining its pristine appearance.
- **Commenced permitting and licensing application:** On October 3, 2023, the company announced that its Joint Venture German subsidiary Altech Business GmBH (ABG) has commenced the permitting and licensing application process for the CERENERGY® battery project in Schwarze Pumpe, Saxony, Germany. Altech, in collaboration with its engineering subcontractor LEADEC and its architecture and balance of plant subcontractor ARIKON, has successfully submitted an application to the authorities for a permit and license for the proposed construction and operation of a 100 MWh CERENERGY® battery plant.
- **Updated Silumina Anodes Plant Calciner Design and Layout:** On August 29, 2023, Altech Batteries announced that it has completed the final design phase for the front-end calciners as well as the corresponding plant layout. The finalized design now consists of two dryers and a four-circuit calciner/cooler configuration. The DFS for Silunima Anodes pilot plant project is on track with Altech obtaining final quotations from essential suppliers, and work on the conclusive design of civil and site infrastructure currently being underway.
- **Raised c. AUD 15.8 mn in Funds:** On August 14, 2023, the company announced that it had raised additional proceeds of c. AUD 2.5 mn. The company received binding commitments from Deutsche Balaton Aktiengesellschaft, and 180 Markets Pty Ltd. The total proceeds raised were c. AUD 15.8 mn, which included AUD 3.0 mn from the recent placement, as well as the allocation of AUD 12.8 mn from the Entitlement Offer and shortfall. The proceeds would be used to further progress the CERENERGY® and Silumina Anodes™ projects.
- **Raised c. AUD 13.3 mn from Entitlement Offer**: On August 07, 2023, the company announced that it had raised total proceeds of AUD 13,300,208 for 42,857,142 shares issued. The Directors also participated in the Offer, and together with the underwriting by major German shareholders Deutsche Balaton and Delphi, this sent a strong message of support for both the CERENERGY and Silumina Anodes™ battery projects. Funds received were to be applied to both projects.
- **Rasing funds through Share Placement and Entitlement Offer:** On July 17, 2023, the company announced that it planned to raise c. AUD 15.8 mn by issuing 226,560,014 fully paid ordinary shares at an issue price of AUD 0.07 per share. AUD 3 mn was to be raised through placement to sophisticated and professional investors while AUD 12.8 mn was to be raised from a pro rata entitlement offer to existing shareholders. The company would use these funds for further progress of CERENERGY® and Silumina Anodes™ Projects.
- **Cerenergy® Batteries Cause 50% Less GHG Emissions than Lithium-Ion Batteries:** On July 11, 2023, the company announced that a study from CICERO, associated with the University of Oslo, showed that CERENERGY® batteries exhibited a minimum of 50% lower GHG emissions compared to lithium-ion batteries. This meant superior environmental performance and footprint.
- **Announced New Suppliers for Altech:** On July 03, 2023, the company announced that it had chosen new suppliers for their extensive expertise in plant manufacturing, automation and robotics. These suppliers laid the groundwork for producing a battery cell unit every 45 seconds. Noteworthy advancements were reportedly made in enhancing the DFS for the project, alongside ongoing expert workshops propelling the CERENERGY® battery project forward.
- **Announced Two 60 KWh Battery Pack Prototypes in Production:** On May 09, 2023, the company announced that two prototypes of the 60 KWh (ABS60) battery pack were in the process of production and assembly at the Fraunhofer IKTS facility in Hermsdorf, Germany. Upon completion, they would undergo rigorous cycling tests in demanding environments. Furthermore, they would be made available for testing purposes at customer locations.
- **Silumina Anodes Project update:** On April 14, 2023, the company announced that it had made progress in incorporating high-capacity, high-purity alumina-coated silicon and graphite in lithium-ion batteries. The company completed its PFS for the construction of a 10,000 tpa Silumina Anodes™ plant in Saxony, Germany, with an NPV of USD 507 mn.

4. Management and Governance[lv]

Exhibit 28: Management and governance		
Name	**Position**	**Experience**
Luke Frederick Atkins	Non-Executive Chairman	• Co-founder of Altech Batteries Ltd. • Non-Executive Director at Australian Silica Quartz Ltd (formerly Bauxite Resources Ltd) and played a key role in third-party negotiations for funding access, JVs, and land and infrastructure • Extensive experience in mining, exploration and corporate governance • Strong experience in capital raising and has held executive and non-executive directorships of several private and publicly listed companies
Ignatius (Iggy) Tan	Managing Director	• Managing Director of Altech Batteries Ltd since 2014 • Responsible for managing and implementing Altech's strategic business objectives, including commercialization of the battery materials coating project as well as the HPA project • Over 30 years of experience in mining and chemical experience with significant achievements in the areas of capital raisings, funding, construction, start-ups and operations • Served as the Managing Director at Nickelore Limited, Galaxy Resources Limited and Kogi Iron Limited
Daniel Lewis Tenardi	Non-Executive Director	• Over 40 years of experience in the mining industry across commodities such as iron ore, gold, bauxite and copper • Associated with Alcoa's bauxite mines in Darling Range for 13 years and its Kwinana refinery for another two years • Strong gold mining experience with companies such as Roche Mining at the Kalgoorlie Superpit and Anglo Gold Ashanti's Sunrise Dam • Associated with Rio Tinto, Bauxite Resources Ltd, CITIC pacific mining, Grange Resources Ltd., holding different prestigious positions
Peter Bailey	Non-Executive Director	• Over 40 years of experience in the mining and industrial mineral production industry, with primary focus on iron ore, bauxite, zinc-lead-copper, alumina refining and alumina chemicals industries • Served as the President of Alcoa Bauxite and Alumina in 1996, Chairman of Alcoa Bauxite JV in Guinea and looked after Alcoa's eight alumina plants outside of Australia • Served as the CEO of Sherwin Alumina, an alumina refinery based in Texas, US
Tunku Yaacob Khyra	Non-Executive Director	• Executive Chairman of a Malaysian base diversified financial and industrial services group, Melewar • Sits on the board of directors of Khyra Legacy Berhad, Mycron Steel Berhad, MAA Group Berhad, Melewar Industrial Group Berhad, Ithmaar Bank B.S.C. and several other private companies
Martin Stein	Chief Financial Officer (CFO) & Company Secretary	• CFO of Altech Batteries Ltd since 2021 • Over 20 years of experience in finance being responsible for capital raising, financial management, shareholder liaison and corporate governance • Worked with Anvil Mining Limited, PwC (London office) and several other ASX listed companies

5. Industry Overview

5.1 Grid Storage Market

5.1.1 Definition and Market Overview[lvi]

Grid-scale storage encompasses technologies linked to the power grid capable of storing energy and supplying it to the grid during more opportune moments, such as night-time, unavailability of solar power or electricity disruption. The expansion of grid-scale battery storage is crucial for aligning with the Net Zero Emissions by 2050 Scenario (a normative scenario that shows a pathway for the global energy sector to achieve net zero CO_2 emissions by 2050). Despite a substantial decrease in battery costs in recent years, driven by the increased production of EVs, challenges such as market disruptions and competition from EV manufacturers have resulted in elevated costs for essential minerals used in battery production, particularly lithium.

Over the past few years, the world has been producing excess energy during the day and companies are discharging this surplus of energy into the ground. California and Germany waste USD 3bn and USD 2bn of energy yearly.

Countries and regions demonstrating significant strides in advancing development include:

- In 2022, China led the market in grid-scale battery storage additions, with annual installations reaching nearly 5 GW
- The US closely followed, commissioning 4 GW throughout the year
- India, in its draft national electricity plan released in September 2022, has set ambitious targets for the development of battery energy storage
- In March 2023, the European Commission issued a series of recommendations on policy actions to support increased deployment of electricity storage within the European Union

The global grid energy storage market was USD 4.4 bn in 2022. It is expected to grow at a CAGR of 28.0% to USD 15.1 bn by 2027 and from 20 GW in 2020 to over 3,000 GW by 2050.

5.1.2 Lithium-ion batteries and their alternatives[lvii]

Lithium is the backbone of lithium-ion batteries of all kinds. Lithium supply remains one of the most crucial elements in shaping the future decarbonization of energy storage. Lithium-ion batteries are the most popular battery storage option for EVs and renewable energy storage installations. Given the production scale and advancements, acquiring and using lithium-ion batteries in the current market is cheaper. However, there are a few shortcomings of the lithium batteries:

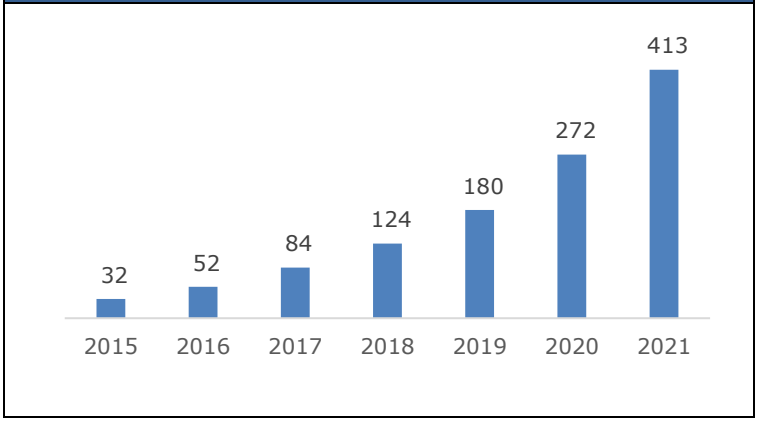
1. The liquid electrolyte in these batteries is flammable, and the industry is trying to move to a solid-state battery. The fires caused by liquid electrolyte batteries are due to the thermal runaway and are difficult to put out because it generates oxygen at the cathode end of the battery.
2. Lithium batteries have a limited temperature range. Lower temperatures decrease their capacities. Cooling the battery is a problem in desert and hot conditions. About 30% of the energy in a battery is used to cool it.
3. The life of a lithium-ion battery is about 8 years, and in grid storage, this can be a very expensive proposition.
4. The prices of lithium, graphite, cobalt and copper have not only risen, but the metals are facing supply problems – 90% of the graphite is from China, which is a geopolitical risk, 70% of cobalt is from the Republic of Congo, where there are questions about its ethical supply, copper supply will need to double to meet the demand of EVs.

Thus, a battery that is fireproof, can withstand a large temperature range and has a long life (higher charging cycles) is needed while being free from lithium, cobalt, graphite and copper. Altech's CERENERGY® battery is a salt-based battery developed to address these issues. It can provide energy and power, which is critical for the grid storage market. Further, these batteries can provide high security at low acquisition and operating costs for the stationary energy storage market.

5.1.3 European Energy Storage Market[lix]

The European Energy storage market is expected to grow at a CAGR of 18% during the forecast period. Over the long term, factors such as increasing demand for uninterrupted power supply and decreasing price of lithium-ion batteries are expected to drive the market.

Exhibit 29: Europe Energy Storage Market: Total Solar plus storage systems installed (in thousand units)[lviii]



Battery energy storage is crucial for a sustainable energy system, regulating voltage, minimizing peak demand charges and integrating renewables, constituting 60% of total system costs. Coupled with renewables, battery energy storage enhances grid stability, aligning with Europe's ongoing energy transformation driven by climate policies. In renewable energy generation, batteries store excess energy for future use, increasing power utilization and efficiency rates. The installation of renewable energy sources in Europe has significantly grown, with a 26.25% increase in capacity from 2017 to 2021. Due to geopolitical shifts, European countries are accelerating renewable deployment to reduce dependence on Russian natural gas, driving increased demand for battery energy storage systems.

Germany has one of Europe's and the world's largest energy storage markets, driven by ambitious energy transition projects and a goal to reduce greenhouse gas emissions by 80% by 2050. The country aimed to phase out nuclear power by 2023, accelerating the development of renewables, with a target for them to meet 80% of the electricity demand by 2030. Household solar storage systems have been on the rise in Germany, with installations projected to increase by nearly 60% in 2021, reaching a cumulative total of 413,000 units. The decline in lithium-ion battery prices, halving in the last five years, is a key driver of battery storage in Germany, fostering increased adoption. Germany encourages storage deployment through innovation auctions, with successful bids in 2021 and 2022 totaling over 1 GW, particularly favoring projects combining solar PV with battery storage. Notably, Fluence Energy GmbH and TransnetBW GmbH are set to deploy the world's largest battery-based energy storage-as-transmission project in Kupferzell, supporting Germany's energy transition with a 250 MW system expected to be completed by 2025. Germany is poised to dominate the European energy storage market in the forecasted period. Given Altech's presence in Europe, it is well-positioned to tap into the growing European market.

5.1.4 SWOT Analysis of the Industry[lx]

Strength: Increasing demand for grid energy storage systems owing to ongoing grid modernization: Solar and wind energy are the most prominent renewable energy types that are stored in grids. However, the obscuring of the sun by clouds or fluctuating wind currents cause variations in the process of energy generation. Such fluctuations create a requirement for flexible grid systems to store energy. Battery energy storage systems are becoming an integral part of grid modernization. These systems help grid operators to store electricity when the electricity generated exceeds demand. The adoption of these systems improves the reliability and flexibility of electricity supply systems for the generation, transmission, and distribution of electric power.

Weakness: High capital expenditure required for installing battery energy storage systems: Battery energy storage technologies, including lithium-ion batteries, flow batteries, and lead-acid batteries, require increased installation investment owing to the high energy density and improved performance offered by them. As a result, the high initial investment costs required for the manufacturing of these batteries can act as a major challenge to the growth of the market.

Opportunity: Surge in the number of rural electrification projects worldwide: Rural electrification is the process of making electrical power accessible in rural or remote areas. Battery energy storage systems are effective for rural electrification. Various countries around the world are trying to develop their remote areas, such as isolated rural areas and peri-urban areas, especially in developing countries; and small islands separated from national grids. As such, they need to have a reliable and uninterrupted power supply from renewable and conventional sources of energy that increases overall system efficiency and ensures economic savings across a system's life cycle. The installation of battery energy storage systems in rural areas would act as a solution to serve businesses and local communities with a reliable and safe power supply.

Threat: Complexities in installing battery energy storage systems at islands or in remote areas: Battery energy storage systems are mainly deployed on islands or in remote areas. The installation of these systems in remote locations is complicated as they are difficult to reach. Remote locations usually include islands and off-grid isolated places, which face many challenges owing to variable generation and supply of power from renewable energy sources. Challenges are related to ambient conditions such as temperature variation during day and night,

costly maintenance owing to commuting difficulties to reach these locations, and the lack of equipment installation infrastructure.

5.2 Anode Product Market[lxi]

5.2.1 Graphite Anode Products

Introduction

Lithium-ion batteries play a pivotal role due to their excellent rechargeability, suitable power density, and outstanding energy density. Graphite has been used for the past 30 years as a lithium-ion host structure for the negative electrode (anode), and is still used in the great majority of presently available commercial lithium-ion batteries despite extensive research efforts to find suitable alternatives with enhanced power and/or energy density, while maintaining the excellent cycling stability. The vast majority of current batteries use either natural or synthetic graphite anode material, and often a blend of both, to achieve the best combination of performance and cost.

Graphite market and its drawbacks

Global demand for graphite is estimatedlxii to grow at a CAGR of 18% till 2030. Market forecaster Roskill expects that global graphite demand from battery makers will grow to a c. 1.7 Mtpa. Benchmark Mineral Intelligence forecasts that planned production capacity and projects in development will not be able to meet this growing demand by as early as 2025.

Although graphite is considered indispensable to the global shift towards EVs as it is the largest component in lithium-ion batteries by weight, with each battery containing 20-30% graphite, it takes 30 times more graphite than lithium to make the batteries due to losses in the manufacturing process; as a result, a graphite deficit is already underway, as demand for EV battery anode ingredients exceeds supply resulting in price increases. Moreover, geo-political risks continue to loom over the graphite industry as, currently, China produces c. 90% of the world's graphite anode material, thereby representing a concern going forward.

Exhibit 30: Global demand forecast 2020-30[lxiii]

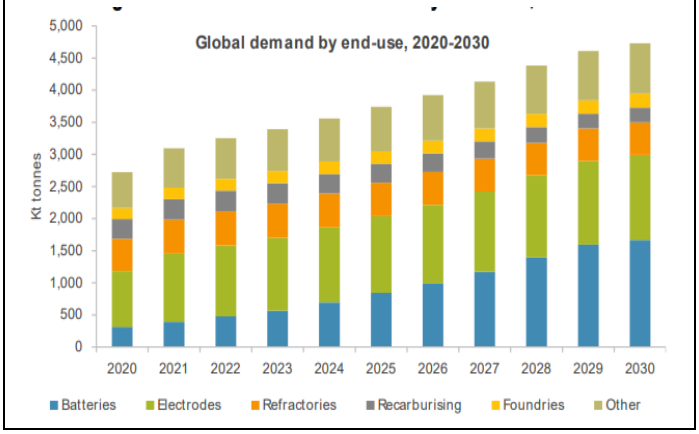
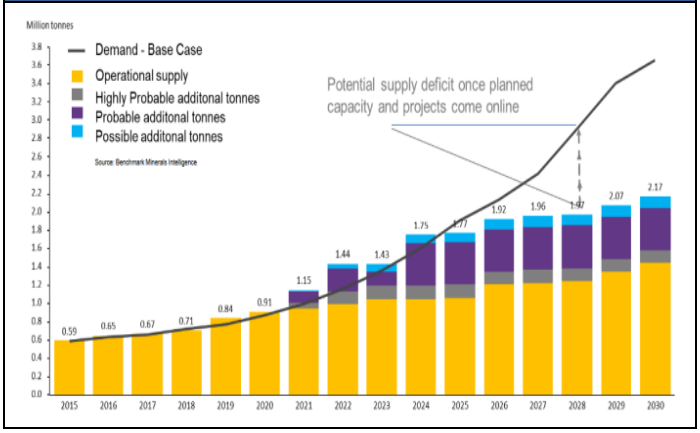


Exhibit 31: Demand for Graphite Anode (RHS)[lxiv]

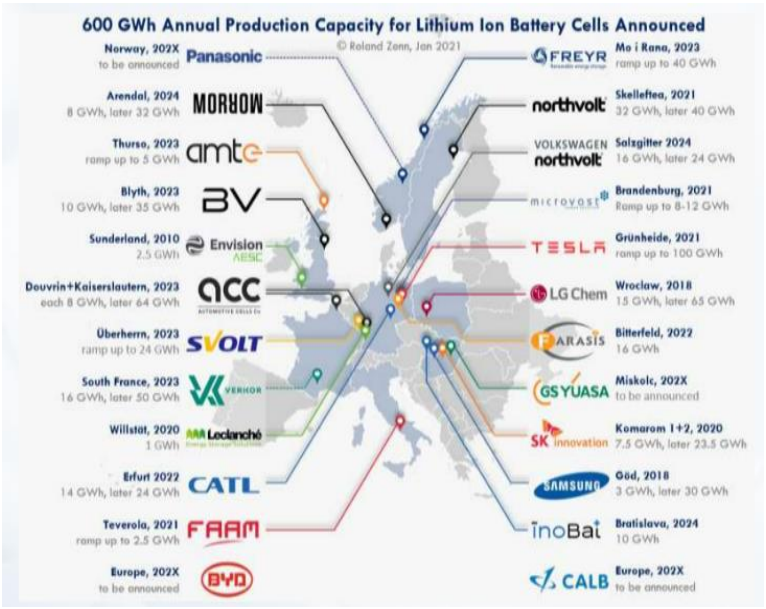


European graphite market

According to the European Union Commission, the European Union could make enough batteries by 2025 to produce sufficient battery cells to meet the needs of the European automotive industry. The EU Commission said that by 2025, planned European facilities would produce enough cells to power at least 6 mn electric vehicles.

It is estimated[lxv] that Europe's lithium-ion battery cell manufacturing capacity will be c. 600 GWh per annum by 2030, while the estimate[lxvi] for graphite anode demand for Europe alone is that it will rise to around 600 ktpa by 2030 market pricing for high-quality, carbon-coated graphite used in the manufacture of lithium-ion EV batteries is USD 10,000 to USD 12,000 per tonne.

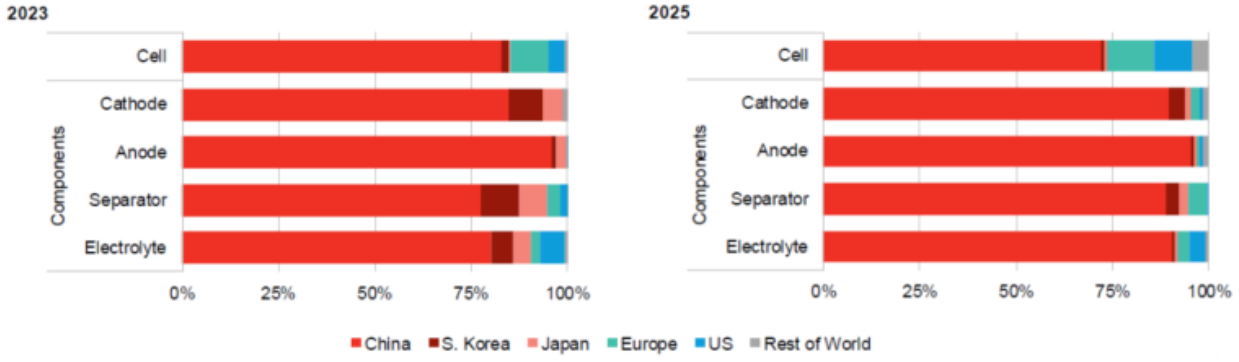
Exhibit 32: Planned European battery "gigafactories"[lxvii]



Supply Gap of Anode Materials in Europe[lxviii]

Europe continued to face a significant deficit in anode material production capacities in 2023, with most of the needed anode material for battery manufacturing being imported from sources outside the region. Chinese producers have been the primary players in the global graphite anode markets, representing over 90% of the total installed capacities. However, restrictions by China on the export of anode graphite to the European Union are poised to expedite the growth of the anode materials sector in Europe.

Exhibit 33: Lithium-ion cell manufacturing capacity ratio by component and plant location[lxix]

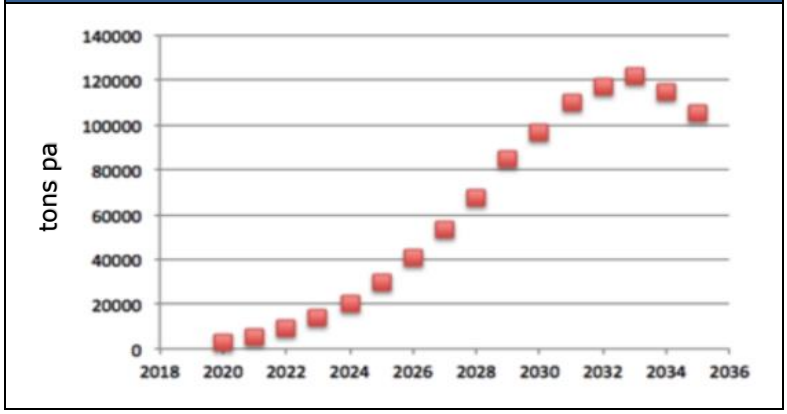


5.2.2 Silicon anode products

Silicon is an emerging anode material that has increased its market share in recent years, but it still accounted for less than 1% of the active anode material market for EV battery production in 2020. There is a significant amount of interest from battery and EV manufacturers such as Tesla, which has publicly stated that it aims to increase the proportion of silicon in its batteries to achieve step-change improvements in energy density and battery life.

The battery makers are projected to experience a rapid increase in demand for anode silicon on a global scale, with an anticipated 18% CAGR from 2023 to 2035, reaching a total of 106 ktpa. It is foreseen that the overall demand for battery-grade silicon will remain around 100 ktpa after 2032, with a continuous shift toward high-value engineered silicon anode materials. The growth until 2033 will be attributed to the gradual replacement of anode graphite with silicon-based materials, aiming to enhance the energy density of the anode.

Exhibit 34: Global demand for silicon based products for EV[lxx]



The driving factors behind the demand for silicon-based materials will stem from the increasing prevalence of EV and the transition toward silicon-rich chemistries. The forecast for battery anode chemistry indicates a threefold increase in the relative amount of silicon used for anodes from 2020 to 2032, rising from less than 6g per kWh to approximately 21g per kWh, thereby partially substituting for the graphite traditionally employed in anodes.

5.2.3 Limitations of an anode

- **Volumetric expansion:** During battery cycling, silicon undergoes much larger volume changes than graphite, at c. 300% compared to 10% for graphite. During lithiation/de-lithiation phases, when lithium is intercalated between anode layers, which can cause it to crack and disintegrate, the process leads to a rapid reduction in cyclic capacity and eventually results in battery failure.
- **First cycle capacity loss:** Commercial lithium-ion batteries use graphite-based carbon anodes. During the battery's initial lithiation cycles, a solid electrolyte interphase (SEI) forms on the graphite anode surface due to the electrochemical instability of the electrolyte compared with lithiated graphite. Lithium-ion losses initially present as inactive layers that form during the very first battery charge cycle; the losses then compound with each subsequent battery usage cycle. As a result, c. 8% of lithium ions are lost during the very first battery charge cycle. This phenomenon is called "first cycle capacity loss" or "first-cycle irreversibility". Formation of SEI inhibits further reduction of the electrolyte, allows Li-ion conduction, and is electronically insulating. However, the fragile and non-uniform SEI is prone to cracking caused by surface defects and anisotropic rough edges, ultimately being re-formed repeatedly during charging and discharging. This continuously consumes some lithium ions in a full battery, and can result in fading capacity.
- **Graphite capacity:** Commercial lithium-ion batteries use graphite-based carbon anodes. Graphite anode material has been found to have a capacity of c. 372 milliampere-hours per gram mass (mAh/g) with a volumetric capacity of c. 700 mAh/cc, and tends to take up more space than any other component in the battery cell. As a result, silicon anodes were in a position to replace graphite anodes, which have a capacity of c. 3,579 mAh/g, and a volumetric capacity of c. 2,100 mAh/cc. As a result, the mass and volume of anode material required to construct an equivalent KWh battery pack is significantly reduced, thereby reducing the costs and weight of the lithium-ion battery. Lithium's other advantages over graphite as an anode material include faster charging.

5.2.4 Latest developments

HPA coating technology proved to be the solution to unresolved obstacles faced by the industry when using silicon in lithium-ion battery anodes, with OEMs now seeking to coat anode particles to address these performance losses. Extensive research demonstrated the use of HPA coatings in anode applications. HPA-coated graphite has been shown to improve battery cycle and safety performance. An eminent researcher group[lxxii] proved that alumina-coated graphite demonstrated excellent cycle performance and safety performance. The cycling retention of coated graphite was 84.95% after 200 cycles compared with 75.07% of non-coated graphite under the same test conditions. The test results show that applying HPA coating to graphite/silicon anode materials can be considered as forming an artificial solid electrolyte interface (SEI) film, which prevents 8-10% of lithium ions from being inactive at the commencement of battery life, thereby improving the battery's electrochemical performance. Also, coating anode materials with HPA has its own safety benefits, which can protect batteries against a number of processes that might lead to catastrophic failure events. Tao Research, in its Nail test, demonstrated that coating graphite prevented thermal runaway compared with un-coated graphite anodes under mechanical abuse. The uncoated graphite pouch battery ignited, reaching 600°C, while the coated graphite battery remained intact and did not exceed temperatures of 90°C.

Exhibit 35: Cycle Performance of coated vs non-coated graphite[lxxi]

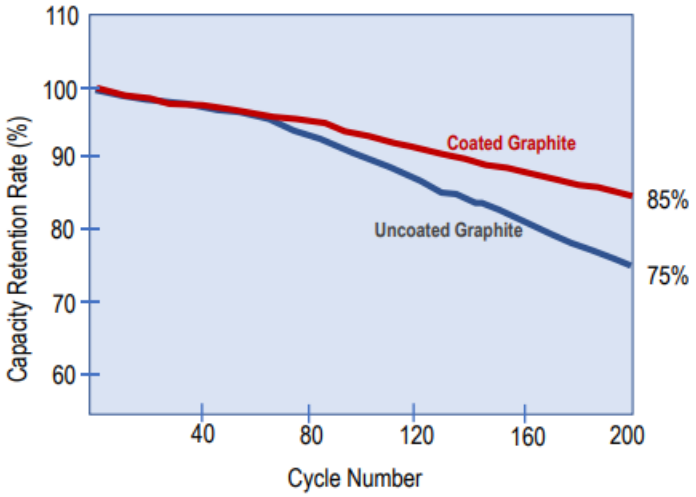
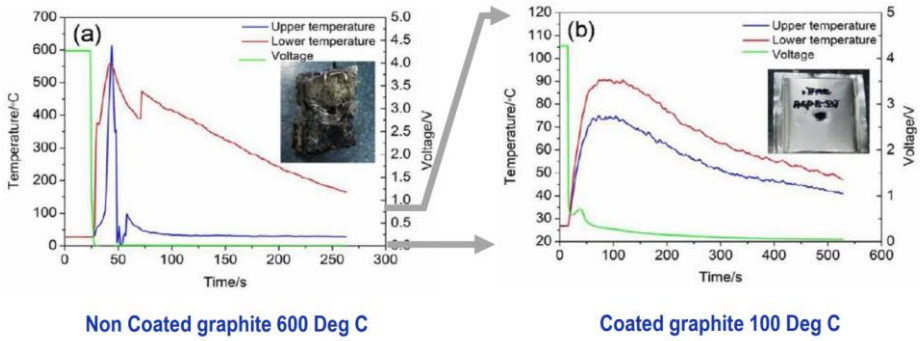


Exhibit 36: Nail penetration test for coated vs non-coated graphite[lxxiii]



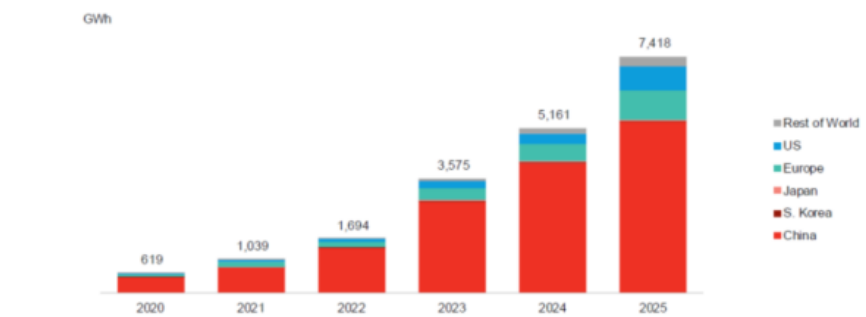
Non Coated graphite 600 Deg C

Coated graphite 100 Deg C

5.3 Current Trends and Outlook

- **Lithium-ion batteries:** The global demand for batteries intended for use in electric passenger cars and electric commercial vehicles is anticipated to grow at a 16% CAGR from 2023 to 2035. The growth in Europe is predicted to be particularly noteworthy due to the expansion of battery manufacturing capacities in the region, aiming to align with the increasing demand for batteries in the automotive industry. Altech projects that, by 2033,

Exhibit 37: Nail penetration test for coated vs non-coated graphite[lxxiv]



approximately 14% of the global battery production will be in Europe, marking a significant increase from the 8% recorded in 2023.

- **Graphite:** Global graphite demand from battery makers is expected to achieve a CAGR of 18% between 2021 and 2030. Global graphite anode capacity stood at c. 800 ktpa as on 2020, and was dominated by Chinese producers, which accounted for 77% of the total market. European OEMs have made a strategic decision to source material from outside of China, which might open up avenues for several new players to enter the supply chain.
- **Silicon:** The global silicon anode materials market stood at c. USD 40 mn in 2020. Silicon-based products will be heavily reliant on the testing progress of high-silicon products, their accreditation cycles and lengthy qualification periods for new battery materials in electric vehicles. BMW is targeting 2024 for the implementation of a silicon-based anode in its electric vehicles. Tesla has also stated that its aim is to increase the amount of silicon in its batteries to achieve step-change improvements in energy density and battery life. Hence, there could be a substantial increase in demand for silicon-based materials going forward.
- **EV penetration:** Eminent researcher Roskill has forecast xEV penetration should reach 43% of the global passenger and commercial vehicle market by 2030 from its 2021 level of 12%. On a regional basis, EV penetration to date within the automotive market has followed highly uneven trajectories. At present, China and Europe are by far the world's largest EV markets. It is expected that EV penetration within Europe should be c. 50% by 2030, mainly driven by Europe's electrification goal for 2025, which is strongly dictated by local automakers' electrification plans. Thus far, major automotive groups have announced electrification plans through specific fleet EV production and sales levels and investment programs to boost EV production. This trend is expected to continue as regulatory pressure on emissions limits should increase over the period to 2030. North America is expected to become the third largest EV market, with growth in EV adoption rates likely to be supported by recent announcements by the US government outlining decarbonization goals.

Exhibit 38: Top six European automaker group shares and electrification goals by 2025[lxxv]

Group	Share of 2020 sales in Europe	Fleet Electrification goals by 2025
VW Group	22%	70%
Renault-Nissan Alliance	15%	65%
PSA	14%	100%
Hyundai Kia Automotive Group	8%	10%
Ford	6%	Not Declared
Daimler Group	6%	20%
Weighted average EV penetration rate		**41%**

5.4 Regulatory Developments

- **Critical Raw Material Act:** The European Commission has announced a new legislative proposal, the Critical Raw Material Act; this initiative will aim to reinforce EU monitoring capacities and strengthen the EU value chain through the identification of mineral resources and raw materials with strong environmental protection. Secure and sustainable supplies of battery materials such as nickel, cobalt, lithium, and graphite will be critical for ensuring rapid energy and mobility transitions. While technological innovation and behavioral changes may provide opportunities for substitution or reduction in the use of some materials, by 2050, 65% of cobalt and 77% of lithium consumed in the EU will come from secondary sources.
- **Circular Economy Action Plan (CEAP):** The European Commission adopted the new circular economy action plan (CEAP) in 2020. The EU's transition to a circular economy will reduce pressure on natural resources and will create sustainable growth. It is a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss. The new action plan aims to:
  - Make sustainable products the norm in the EU
  - Empower consumers and public buyers
  - Focus on the sectors that use most resources and where the potential for circularity is high
  - Ensure less waste
  - Make circularity work for people, regions and cities
  - Lead global efforts on a circular economy

6. Valuation

The fair market value for the Company's shares stood between AUD 767.1 mn and AUD 1,527.9 mn on July 23, 2024. The fair market value for one of the Company's publicly traded shares stood between AUD 0.45 and AUD 0.89 on July 23, 2024. The valuation approach followed is the NPV method.

6.1 NPV Method

Valuation	
Risk free rate (Rf)	4.4%[lxxvi]
Beta	0.8[lxxvii]
Market return	10.2%[lxxviii]
Cost of equity	14.1%
Cost of debt (after tax)	6.3%
WACC (Discount Rate)	14.1%

Year Ending – June (AUD 000's)	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
FCFF (Low)								
Free cash flow to firm	(4,08,688)	(1,12,743)	75,912	3,46,811	3,43,401	3,40,204	3,38,703	3,38,315
Discount factor	0.99	0.87	0.76	0.67	0.58	0.51	0.45	0.39
Present value of FCF	**(4,05,311)**	**(97,984)**	**57,815**	**2,31,468**	**2,00,847**	**1,74,370**	**1,52,131**	**1,33,164**
FCFF (High)								
Free cash flow to firm	(4,72,217)	2,04,142	3,25,967	4,29,871	4,26,968	4,24,157	4,23,323	4,23,675
Discount factor	0.99	0.87	0.76	0.67	0.58	0.51	0.45	0.39
Present Value of FCF	**(4,68,316)**	**1,77,417**	**2,48,259**	**2,86,903**	**2,49,724**	**2,17,399**	**1,90,139**	**1,66,762**

Arrowhead Fair Value Bracket	Low	High
Present Value of FCFF	12,21,418.3	20,40,013.6
Shares O/S (000's)	17,10,571.9	17,10,571.9
Fair Share Value Bracket (AUD)	**0.45**	**0.89**
Current Market Price (AUD)[lxxix]	0.06	0.06
Upside/(Downside)	715.4%	1524.0%
Current Market Cap.	94,081.5	94,081.5
Target Market Cap. Bracket (AUD 000's)	7,67,139.3	15,27,850.6

See important disclosures on page 40 of this report.

Key Assumption for Valuation: Following are the assumptions used in valuation:

- In the forecast period of 2024E-2049E, production is assumed to begin in 2026 in the low case and 2025 in the high case.
- In the forecast period of 2024E-2049E, the assumptions on CERENERGY® battery project has been made prior to the Bankable Feasibility Study.
- In the forecast period of 2024E-2049E, the production capacity of CERENERGY® battery project is taken as 100 MWh. However, the construction of Gigawatt factory has not yet been considered in the valuation model, which we understand will alter the valuation of the company projected as on the date of publication. Similarly, the production capacity of Silumina Anode™ project has been considered as 10 ktpa throughout the forecasted period.
- In the forecast period of 2024E-2049E, post market research, the average selling price of CERENERGY® battery project has been considered as 900 EUR/KWh in High Case and 700 EUR/KWh in Low Case. Also, the cost of CERENERGY® battery has been taken as 40-50% cheaper than Li-ion batteries.
- In the forecast period of 2024E-2049E, the capacity utilization has been kept constant at 100%.
- The capital raising of all the projects is assumed to be completed by FY 2024.

Approach for NPV Valuation

Time horizon: The time period chosen for the valuation is 312 months (2024E-2049E).

Prudential nature of valuation: It should be noted that Arrowhead's fair value bracket estimate is relatively prudent, as it discounts the eventuality of any new products being launched in the market or any significant change in strategy.

Important information on Arrowhead methodology

The principles of the valuation methodology employed by Arrowhead BID are variable to a certain extent depending on the subsectors in which the research is conducted, but all Arrowhead valuation research possesses an underlying set of common principles and a generally common quantitative process.

With Arrowhead Commercial and Technical Due Diligence, Arrowhead extensively researches the fundamentals, assets and liabilities of a Company, and builds solid estimates for revenue and expenditure over a coherently determined forecast period.

Elements of past performance, such as price/earnings ratios, indicated as applicable, are present mainly for reference purposes. Still, elements of real-world past performance enter the valuation through their impact on the commercial and technical due diligence.

Elements of comparison, such as multiple analyses may be to some limited extent integrated in the valuation on a project-by-project or asset-by-asset basis. In the case of this Altech Batteries Ltd. report, there are no multiple analyses integrated in the valuation.

Arrowhead BID fair market value bracket

The Arrowhead Fair Market Value is given as a bracket. This is based on quantitative key variable analysis, such as key price analysis for revenue and cost drivers or analysis and discounts on revenue estimates for projects, especially relevant to those projects estimated to provide revenue near the end of the chosen forecast period. Low and high estimates for key variables are produced as a tool for valuation. The high-bracket NPV valuation is derived from the high-bracket key variables, while the low-bracket NPV valuation is based on the low-bracket key variables.

In principle, an investor who is comfortable with the high-brackets of our key variable analysis will align with the high-bracket in the Arrowhead Fair Value Bracket, and likewise in terms of low estimates. The investor will also take into account the Company intangibles – as presented in the first few pages of this document in the analysis of strengths and weaknesses and other essential Company information. These intangibles serve as supplementary decision factors for adding or subtracting a premium in the investor's own analysis. The bracket should be understood as a tool provided by Arrowhead BID for the reader of this report and the reader should not solely rely on this information to make his decision on any particular security. The reader must also understand that on one hand, global capital markets contain inefficiencies, especially in terms of information, and that on the other hand, corporations and their commercial and technical positions evolve rapidly: this present edition of the Arrowhead valuation is for a short to medium-term alignment analysis (one to twelve months). The reader should refer to important disclosures on page 40 of this report.

7. Appendix

7.1 Altech's Financial Summary

Exhibit 39: Financial Summary

Low Bracket Estimates

Year Ending June	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Revenue (AUD 000's)	42	42	6,01,574	6,02,773	6,03,973	6,05,172	6,06,372
Operating profit (AUD 000's)	(23,433)	(23,059)	2,80,877	2,78,855	2,76,956	2,75,336	2,74,148
Net income (AUD 000's)	(68,317)	(1,19,789)	1,84,147	1,27,487	1,26,158	1,25,024	1,27,343
EPS (AUD)	(0.06)	(0.11)	0.17	0.12	0.12	0.12	0.12
Growth rates (%)							
Revenue	(99.7%)	0.0%	NM	0.2%	0.2%	0.2%	0.2%
Operating profit	NM	NM	NM	(0.7%)	(0.7%)	(0.6%)	(0.4%)
Net income	NM	NM	NM	(30.8%)	(1.0%)	(0.9%)	1.9%
EPS	NM	NM	NM	(30.8%)	(1.0%)	(0.9%)	1.9%
EBITDA	NM	NM	NM	(0.9%)	(0.8%)	(0.7%)	(0.6%)
Margins (%)							
Gross margins	100.0%	100.0%	51.3%	50.8%	50.3%	49.9%	49.5%
Operating profit margin	NM	NM	46.7%	46.3%	45.9%	45.5%	45.2%
Net profit margin	NM	NM	30.6%	21.2%	20.9%	20.7%	21.0%
EBITDA margins	NM	NM	49.2%	48.7%	48.2%	47.8%	47.4%
Ratios							
ROA	(4.3%)	(2.3%)	27.5%	23.7%	21.2%	19.2%	18.2%
ROE	N.A	N.A	N.A	136.1%	57.2%	36.1%	27.0%
Debt/Equity	N.A	N.A	36.0x	6.8x	3.8x	2.6x	1.8x

Exhibit 40: Financial summary

High Bracket Estimates

Year ending June	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Revenue (AUD 000's)	42	6,58,317	6,59,627	6,60,937	6,62,247	6,63,557	6,64,867
Operating profit (AUD 000's)	(25,737)	3,46,778	3,40,159	3,38,634	3,37,173	3,35,894	3,34,917
Net income (AUD 000's)	(64,976)	1,83,460	1,78,826	1,77,759	1,76,736	1,75,841	1,79,358
EPS (AUD)	(0.06)	0.17	0.17	0.16	0.16	0.16	0.17
Growth rates (%)							
Revenue	(99.7%)	NM	0.2%	0.2%	0.2%	0.2%	0.2%
Operating profit	NM	NM	(1.9%)	(0.4%)	(0.4%)	(0.4%)	(0.3%)
Net income	NM	NM	(2.5%)	(0.6%)	(0.6%)	(0.5%)	2.0%
EPS	NM	NM	(2.5%)	(0.6%)	(0.6%)	(0.5%)	2.0%
EBITDA	NM	NM	(0.6%)	(0.6%)	(0.6%)	(0.5%)	(0.4%)
Margins (%)							
Gross margins	100.0%	56.6%	56.2%	55.9%	55.5%	55.2%	55.0%
Operating profit margin	NM	52.7%	51.6%	51.2%	50.9%	50.6%	50.4%
Net profit margin	NM	27.9%	27.1%	26.9%	26.7%	26.5%	27.0%
EBITDA margins	NM	54.6%	54.2%	53.7%	53.3%	52.9%	52.6%
Ratios							
ROA	(4.8%)	30.7%	26.0%	22.8%	20.2%	18.2%	17.2%
ROE	N.A	N.A	74.0%	42.3%	29.6%	22.7%	18.9%
Debt/equity	N.A	7.0x	3.2x	2.1x	1.5x	1.2x	0.9x

7.2 Altech Batteries Ltd. Balance Sheet Forecast

Exhibit 41: Consolidated Balance Sheet

All figures in AUD '000, unless stated differently

Low Bracket estimates

Year Ending – June	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E
Total current assets	6,23,181	4,13,636	6,12,384	7,53,629	8,92,602	10,29,351	10,67,111	11,57,549	12,49,130
Total non-current assets	4,26,497	5,16,274	5,01,701	4,87,978	4,75,204	4,63,526	4,53,163	4,44,428	4,37,768
TOTAL ASSETS	10,49,678	9,29,910	11,14,085	12,41,606	13,67,806	14,92,877	15,20,274	16,01,977	16,86,898
Total current liabilities	6,566	6,587	6,615	6,649	6,690	6,738	6,793	6,854	6,923
Total non-current liabilities	10,77,554	10,77,554	10,77,554	10,77,554	10,77,554	10,77,554	9,77,554	9,27,554	8,77,554
TOTAL LIABILITIES	10,84,120	10,84,141	10,84,169	10,84,203	10,84,244	10,84,292	9,84,347	9,34,408	8,84,477
Total shareholders' equity	(34,442)	(1,54,231)	29,916	1,57,403	2,83,561	4,08,585	5,35,928	6,67,568	8,02,421
TOTAL LIABILITIES & EQUITY	10,49,678	9,29,910	11,14,085	12,41,606	13,67,806	14,92,877	15,20,274	16,01,977	16,86,898

Exhibit 42: Consolidated balance sheet

All figures in AUD '000, unless stated differently

High Bracket estimates

Year Ending – June	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E	2032E
Total current assets	5,49,497	6,45,107	8,40,374	10,33,666	12,24,932	14,14,154	14,55,528	15,71,272	17,18,493
Total non-current assets	4,87,722	5,75,593	5,59,180	5,43,682	5,29,193	5,15,861	5,03,899	4,93,619	4,85,468
TOTAL ASSETS	10,37,219	12,20,700	13,99,554	15,77,348	17,54,125	19,30,014	19,59,426	20,64,891	22,03,961
Total current liabilities	6,566	6,587	6,615	6,649	6,690	6,738	6,793	6,854	6,923
Total non-current liabilities	10,61,754	10,61,754	10,61,754	10,61,754	10,61,754	10,61,754	9,11,754	8,31,754	7,81,754
TOTAL LIABILITIES	10,68,320	10,68,341	10,68,369	10,68,403	10,68,444	10,68,492	9,18,547	8,38,608	7,88,677
Total shareholders' equity	(31,101)	1,52,359	3,31,185	5,08,945	6,85,681	8,61,522	10,40,880	12,26,282	14,15,284
TOTAL LIABILITIES & EQUITY	10,37,219	12,20,700	13,99,554	15,77,348	17,54,125	19,30,014	19,59,426	20,64,891	22,03,961

8. Analyst Certifications

I, Sumit Wadhwa, certify that all the views expressed in this research report accurately reflect my personal views about the subject security and the subject Company, based on the collection and analysis of public information and public Company disclosures.

I, Ayushi Saraswat, certify that all the views expressed in this research report accurately reflect my personal views about the subject security and the subject Company, based on the collection and analysis of public information and public Company disclosures.

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8. Notes and References

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