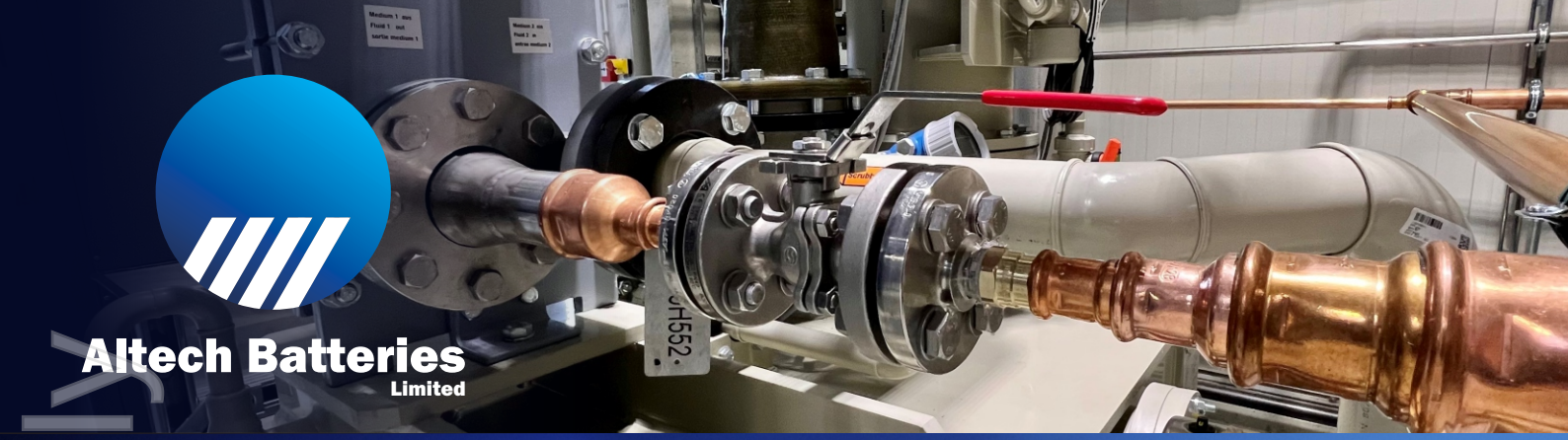


Altech Batteries Limited

QUARTERLY REPORT

June 2023

CERENERGY® Proposed Battery Specifications

- CERENERGY® Battery Specifications
- 60 kWh Battery Pack (ABS60) for commercial applications
- 1 MWh (ABS1000) GridPack for grid-level storage and industrial power
- Fireproof, all-weather applications, multiple cycles per day
- Lowest levelised energy storage cost compared to Li-ion batteries
- Surplus renewable power discharged to the ground in Germany is EUR 2 billion per annum
- Reliable grid storage battery solution of the future

Two CERENERGY® 60 kWh Battery Pack Prototypes in Production

- Final market product prototype under fabrication - 60 kWh (ABS60) battery pack
- Produced at the Fraunhofer IKTS facility in Hermsdorf, Germany
- 60 kWh battery pack design launched on 7 November 2022
- Extensive cycling simulations to evaluate the temperature profile
- Design freeze for prototype fabrication
- Prototypes for customer testing and qualification process

CERENERGY® Battery 50% Greenhouse Gas Emissions of Lithium-ion Batteries

- CICERO engaged to evaluate green credentials of CERENERGY® battery project
- Independent studies cited on Greenhouse Gas Emissions (GHG) for both lithium-ion and CERENERGY® batteries
- Comprehensive analysis performed of the life cycle of both battery types
- CERENERGY® batteries exhibit a minimum 50% lower GHG emissions compared to lithium-ion batteries
- Superior environmental performance and footprint
- CERENERGY® eliminates the need for critical metals such as lithium, cobalt, copper, graphite, and manganese
- ESG reporting program initiated - World Economic Forum ESG Framework

CERENERGY® Battery Project Suppliers Confirmed

- German battery plant suppliers selected
- Extensive expertise in manufacturing plants, automation and robotics
- Design basis completed of one battery cell unit every 45 seconds
- Outstanding progress and advancement of the project Definitive Feasibility Study
- Expert Workshops continue to advance the CERENERGY® battery project

Great Progress at German Silumina Anodes™ Pilot Plant

- Significant progress and according to plan
- Front end wet circuit complete
- Commissioning underway of wet circuit
- On site laboratory completed and being commissioned
- Long lead calciner still outstanding from South Africa
- Expect to commission calcining end of Q3

CERENERGY® Proposed Battery Specifications

Altech announced the release of preliminary battery specifications for its CERENERGY® 60 kWh (ABS60) and 1 MWh (ABS1000) GridPack battery products. Collaborating closely with its joint venture partner, Fraunhofer IKTS ("Fraunhofer"), Altech has developed these specifications to cater to the evolving needs of the renewable energy and grid storage market. These preliminary specifications serve as a significant milestone for Altech, enabling the company to initiate discussions with potential off-take partners and secure future sales in the lucrative and growing grid storage battery market.

The increasing demand for renewable energy sources, coupled with the intermittent nature of renewable power generation, has underscored the critical need for efficient and reliable energy storage solutions. Grid storage batteries have emerged as a key enabler for balancing energy supply and demand, ensuring stable power delivery, and maximising the utilisation of renewable energy sources.

The transition of countries like Germany to a power system heavily reliant on weather-dependent renewables is reaching its limitations, a challenge that all nations adopting wind and solar energy will eventually confront. The absence of sunlight and wind for prolonged periods raises concerns about power supply. Additionally, the short, dark, and cold days of midwinter pose a specific problem for meeting countries' power demand through renewables.

In addition to shortages, surpluses also pose a significant issue. On days when sunlight is abundant, but demand is low, excess power is discharged to the ground. This results in substantial wastage of electrical power. Germany alone wastes approximately EUR 2 billion annually due to this discharge. Similarly, the state of California wastes approximately US$3 billion of renewable energy each year due to surpluses or lack of grid capacity to bring the power to where it is needed. Excess power in the grid can lead to negative prices, compelling grid operators to pay customers to consume electricity. The expansion of renewables amplifies the volatility within the system. Grid battery storage is crucial to maintain a delicate balance in power supply to ensure a stable and reliable energy infrastructure, whilst accommodating the fluctuations inherent in renewable energy sources.

The grid energy storage market is expected to grow by a 28% compound annual growth rate in the coming decade.
The global grid energy storage market is expected to grow from USD 4.4 billion in 2022 to USD 15.1 billion by 2027. Or further out, growth is expected from 20 GW in 2020 to over 3,000 GW by 2050.

Altech recognises the potential of the grid storage battery market and aims to contribute to its growth and development through the introduction of its CERENERGY® battery products. Altech has developed cutting-edge battery specifications that meet the specific requirements of this sector. The preliminary specifications for the CERENERGY® 60 kWh (ABS60) battery pack, as well as the 1 MWh (ABS1000) GridPack battery products, are on the page 4..

Uwe Ahrens
Alternate Director

OUR VISION

MEETING A BATTERY STORAGE FUTURE AS THE WORLD TRANSITIONS TO THE ELECTRIFICATION OF ENERGY SOLUTIONS

Specifications 60 kWh Battery Pack (ABS60)

The 60 kWh Battery Pack (ABS60) is rated at an operating voltage of 600 volts and 100 amp (Ah). The battery is designed to provide battery backup and excellent performance in grid-tied commercial applications for an uninterrupted power supply.

Battery Type:	Battery Pack ABS 60 Sodium Nickel Chloride Solid State Battery
Application:	Power Grid Operation & Renewable Energy Storage

ABS 60 - Battery Pack

Dimensions	500mm x 2330mm x 1100mm
Weight:	≈800kg
Nom. Voltage:	600 V DC
Voltage Range:	410 V DC (min) to 670 V DC (max)
Current Capacity:	100Ah Nominal
Discharge Current:	cont. 25 A / trans. 33A
Internal Ops Temp.:	min. 270° C - max. 350° C
Ambient Ops Temp.:	~40° C to 60° C
IP Rating:	IP65
Nominal Energy Capacity:	60kWh
Operational SoC Range:	15% - 95% (80%)
C-Rate:	0.16C - 0.33C bi-directional
C-Rate Power Mode:	0.5C for 15 Minutes
24h Cycle Capacity:	Yes, continuous without interruptions
Cycle per day:	up to 3 @ 80%
Design Life:	>15 years
Warranty:	5 years or 5000 cycles

Specifications 1 MWh GridPack (ABS1000)

The ABS1000 GridPack battery targets larger-scale applications, such as grid-level storage and industrial power backup. With a capacity of 1 MWh, this high-performance battery system ensures a stable and uninterrupted power supply, contributing to grid stability and reducing reliance on fossil fuels. The preliminary specifications for the ABS1000 GridPack battery positions Altech as a frontrunner in the grid storage market, offering a technologically advanced and commercially viable solution to meet the industry's evolving needs.

ABS 1000 - Grid Pack

Arrangement:	18 Battery Pack, with controller BMS
Dimensions:	Open standard high cube 20ft Container
Delivery:	20ft high cube container 2.4m x 5.9m x <27m
Weight:	<17t
Nom. Voltage:	600 V DC
Voltage Range:	410 V DC (min) to 670 V DC (max)
Current Capacity:	100Ah Nominal
Discharge Current:	cont. 25 A / trans. 33A
Internal Ops Temp.:	min. 270° C - max. 350° C
Ambient Ops Temp.:	~40° C to +60° C
IP Rating:	IP65, CE
Nominal Energy Capacity:	1MWh / nominal 1,08 MWh
Operational SoC Range:	15% - 95% (80%)
C-Rate:	0.16C - 0.33C bi-directional
C-Rate Power Mode:	0.5C for 15 Minutes
24h Cycle Capacity:	Yes, continuous without interruptions
Cycle per day:	up to 3 @ 80%
Design Life:	>15 years
Warranty:	5 years or 5000 cycles

GridPack USP - Macro Parameters

- Safe, non-flammable, zero fire and explosive hazards
- No location limitation
- Stackable up to 3 GridPacks
- Operates in any climate without external thermal management, forced cooking
- Negligible maintenance costs
- Plug and play ready to operate
- High availability (>99%)
- Battery may be idle for any period of time and be restarted without capability loss
- Round-trip efficiency of avg. 90% (DC)
- Lowest levelised energy storage costs
- Can be shipped fully assembled

* Levelised energy storage cost is the overall costs including capital, maintenance and operating cost over the life of the battery

The Altech GridPacks have been engineered to ensure complete protection from both dust and any external environments. This means that there is no need for any additional shelters or buildings to house the Altech GridPack batteries, and they can be safely installed outdoors in any weather conditions. The Altech GridPacks will be constructed using a sea container design, which facilitates their easy transportation by sea or road to the installation site, as well as ensuring simple installation.

Unlike other mega battery pack designs on the market, these GridPacks can be stacked on top of each other. The ability of the GridPacks to be stacked minimises the battery footprint and permits easy scalability to meet any energy storage requirements. The stackable feature, coupled with the "plug and play" design, makes the GridPacks the obvious choice for BESS solutions to meet any future energy storage requirements.

The Altech GridPacks are also designed without the requirement for any moving parts such as cooling fans, which are typically found in lithium-ion battery mega packs.

This is a notable advantage, as end-users have raised concerns about the noise generated by mega packs, preventing them from being placed near residential areas. With the absence of any moving parts, the Altech GridPacks are practically maintenance-free and completely noise-free in operation, making them an ideal solution for remote and noise-sensitive environments.

Two CERENERGY® 60 kWh Battery Pack Prototypes in Production

Altech announced that two prototypes of the 60 kWh (ABS60) battery pack are currently being produced and fabricated at the Fraunhofer IKTS facility in Hermsdorf, Germany. Once completed, the battery packs will undergo cycling testing under extreme conditions, and they will be available for testing at customer premises.

The design for the CERENERGY® Sodium Chloride Solid State (SCSS) 60 kWh battery pack (ABS60), destined for the renewable energy and grid storage markets, was launched by Altech and its joint venture partner Fraunhofer, on 7 November 2022. This battery pack boasts a rated operating voltage of 600 volts at 100 amp (A).

Internal with cell frames

Battery Pack with cover

Temp Simulation

1MWh GridPacks

Following the launch, the joint venture carried out extensive cycling simulations to evaluate the temperature profile of the internal components of the battery. Typically, the charging process involves a net endothermic (heat energy absorption) reaction, whereas the discharge process leads to an exothermic (heat energy release) reaction. The simulations indicate that the battery can undergo charge and discharge cycling while maintaining stable internal temperatures without overheating, even under extreme conditions such as a desert environment, where the ambient temperature was recorded at 60°C. No instances of overheating were reported during these simulations.

Based on the results of these simulations, the specifications for the 60 kWh battery packs have been finalised, and orders for materials required for the production of two prototype batteries have been placed. This process involves the manufacture of 480 ceramic solid-state cells, along with the production and procurement of auxiliary equipment including but not limited to cabling, module structures, composite isolation cabinet and battery management system (BMS).

On September 14, 2022, Altech announced the joint venture agreement with Fraunhofer IKTS, a world-leading German battery institute, to commercialise the CERENERGY® Sodium Chloride Solid State (SCSS) Battery, which is a game-changing alternative to lithium-ion batteries in the grid storage market. The joint venture company is majority-owned (75%) by Altech and its associated entity Altech Advanced Materials AG. The Company will focus on commercialising a 100 MWh project to be constructed on Altech's industrial site in Schwarze Pumpe, Germany. The CERENERGY® batteries are designed for a lifespan of more than 15 years, are fire and explosion-proof, and can operate in extreme cold and desert climates. The battery technology uses table salt and is free of lithium, cobalt, graphite, and copper, thus eliminating exposure to critical metal price rises and supply chain concerns. The Altech-Fraunhofer joint venture is currently commercialising a 100 MWh per annum SCSS battery plant, specifically tailored for the stationary energy storage market, and located on Altech's site in Saxony, Germany.

On 29 March 2023, Altech launched the design for its 1.0 MWh GridPack (ABS1000) battery system. The pre-installed solution is equipped with up to 18 ABS60 60 kWh battery packs connected to a pack power management system.

The Altech GridPacks are designed with the "plug and play" feature to ensure that they can be easily installed in remote locations.

The Altech GridPacks have been engineered to ensure complete protection from both dust and any external environments. This means that there is no need for any additional shelters or buildings to house the Altech GridPack batteries, and they can be safely installed outdoors in any weather conditions. The Altech GridPacks will be constructed using a sea container design, which facilitates their easy transportation by sea or road to the installation site, as well as ensuring simple installation.

Unlike other mega battery pack designs on the market, these GridPacks can be stacked on top of each other. This minimises the battery footprint, and permits easy scalability to meet any energy storage requirements.

The stackable feature, coupled with the "plug and play" design, makes the GridPacks the obvious choice for BESS solutions to meet any future energy storage requirements. The Altech GridPacks are also designed without the requirement for any moving parts such as cooling fans, which are typically found in lithium-ion battery mega packs.

"We have built a dynamic and fast moving project team incorporating personnel from Altech, Fraunhofer and various leading German engineering companies and industrial contractors. The advancements made on the final designs of the 60 kWh Battery Pack in such a short time frame are outstanding. I am very pleased with the progress"

Managing Director Iggy Tan.

CERENERGY® Battery 50% Greenhouse Gas Emissions of Lithium-ion Batteries

Altech announced that the Company has engaged the Centre of International Climate and Environmental Research (CICERO), associated with the University of Oslo, for a green accreditation of the CERENERGY® battery and project.

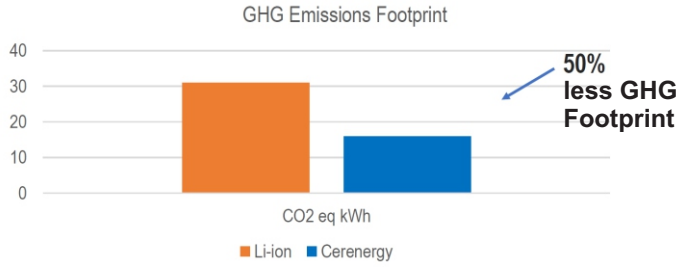
Altech has enlisted the services of CICERO to conduct an external assessment of its environmental credentials. CICERO is renowned for its expertise in providing independent evaluations for green credentials, particularly within the green bond market. Previously, the Company sought CICERO's accreditation for its Silumina Anodes™ project, which received a "Medium Green" rating.

With the ongoing shift towards renewable energy sources in the global energy sector, the importance of efficient energy storage systems is growing rapidly. Grid storage batteries have emerged as a highly promising solution to address the intermittency and variability associated with renewable energy sources. Altech is well aware of this trend and has strategically focused its efforts on the grid storage battery market, exclusively targeting this sector with its revolutionary Sodium-Chloride Solid State CERENERGY® batteries. Whilst lithium-ion batteries currently dominate the emerging grid storage sector, the following analysis examines the carbon footprint of the CERENERGY® battery in comparison to its competitors.

Greenhouse Gas Emissions (GHG) Footprint

A study titled "Life Cycle Assessment of Sodium-Nickel-Chloride Batteries (CERENERGY® batteries)" conducted by the Sustainable Technologies Laboratory at Bochum University of Applied Sciences in Bochum examined the ecological implications of different battery types, specifically lead acid batteries, lithium-ion batteries, and sodium-chloride CERENERGY® batteries. The study focused on greenhouse gas emissions (GHG) as a key parameter and incorporates two scenarios related to end-of-life (EoL) considerations, including waste management and battery lifespan.

The results indicate that the GHG emissions of CERENERGY® batteries range from 9.1 to 22.7 g CO2eq per kWh (with an average of 16 g CO2eq per kWh) discharged and consumed, compared to 31.3 g CO2eq for lithium-ion batteries and 122.1 g CO2eq for lead-acid batteries. The life cycle assessment concludes that CERENERGY® batteries exhibit a GHG footprint of at least 50% lower than that of lithium-ion batteries. This outcome aligns with the fact that CERENERGY® batteries do not rely on critical metals such as lithium, cobalt, copper, graphite, and manganese, which are associated with high GHG emissions from mining and extraction processes. Instead, CERENERGY® batteries employ sodium-chloride (common table salt) and nickel, which are also used in lithium-ion batteries. The production of lithium-ion batteries has faced criticism due to its negative environmental impact.



GHG Emissions Footprint of Lithium-ion batteries vs CERENERGY® type of batteries

Use of Renewable Power

The planned CERENERGY® battery plant in Saxony, with a capacity of 100 MWh, has been meticulously designed to minimise its greenhouse gas (GHG) footprint by leveraging renewable energy sources. To illustrate, the tunnel kiln utilised for sintering the ceramic tubes will be powered by electricity instead of natural gas, enabling the utilisation of renewable power. In fact, the entire factory will completely abstain from natural gas usage. All heating systems within the plant have been specifically designed for renewable electrical heating. The site's total power requirement is approximately 5 MWh, and negotiations are currently underway to secure a renewable power supply for the facility.

On Site Renewable Generation

The 100 MWh CERENERGY® battery plant has been designed with an expansive factory roof space dedicated to housing photovoltaic panels. These panels harness solar energy during daylight hours, generating renewable power. To optimise energy usage, the plant employs multiple banks of 1 MWh GridPacks to store excess energy during the day for use during nighttime hours. By combining photovoltaic panels with energy storage capabilities, the CERENERGY® battery plant demonstrates a commitment to sustainable practices.

Recycling Plant

In the comprehensive design of the 100 MWh plant, a recycling facility will be integrated. This recycling plant will have the capability to recycle both off-spec battery units and returned battery units from the field. Unlike many lithium-ion battery producers that rely on third-party companies for recycling, Altech has adopted a cradle-to-grave approach by assuming the responsibility for battery recycling in its design and business approach. The recycling unit within the plant will be equipped to efficiently extract and recycle various components. It will be capable of removing and recycling the nickel probes, recovering the nickel from the cathode, and recycling the stainless-steel canister. By incorporating a dedicated recycling facility, Altech demonstrates its commitment to sustainable practices and takes proactive steps to ensure the proper disposal and recycling of battery components, minimising waste and environmental impact.

ESG Reporting Program

Altech has initiated the reporting process in alignment with the World Economic Forum's Stakeholder Capitalism Metrics ESG Framework, utilising Socialsuite's ESG platform. The primary objective is to showcase the existing on-the-ground efforts and initiatives undertaken by Altech. As the ESG reporting commenced, it became apparent that many of the ESG metrics were already in place; they simply needed to be organised within a visible framework to effectively communicate with stakeholders. The first report will be issued in the next quarter.

The significance of ESG reporting is underscored by the fact that 82% of retail investors express interest in investing in socially and environmentally responsible companies. Furthermore, 9 out of 10 institutional investors now incorporate ESG factors into their investment decision-making processes.

This growing recognition and consideration of ESG criteria by investors highlight the importance of transparent reporting and the role it plays in fostering sustainable business practices and attracting investment from socially conscious stakeholders.

Managing Director Iggy Tan expressed confidence in obtaining a green accreditation for the Company based on previous experience and interactions with CICERO.

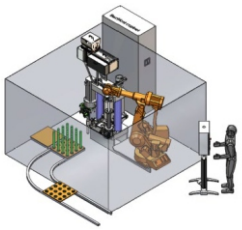
Mr Tan stated; *"There is clearly an environmental advantage of the CERENERGY® battery and proposed factory. Considering the GHG footprint evaluation conducted by independent groups, we anticipated from the outset that our batteries would be classified as 'green batteries'. We are currently in the official accreditation process".*

CERENERGY® Battery Project Suppliers Confirmed

Critical expert Workshops led by Managing Director Iggy Tan, were held during the week commencing 22 May 2023 at Fraunhofer's facility in Dresden, Germany.

The Workshops were attended by Altech personnel, Leadec's process and automation engineering team, and Fraunhofer's CERENERGY® expert battery team. Most importantly, all the key suppliers for the project attended the Workshops and presented their conceptual design for their section of plant. All design areas involve high automation and robotics.

Eirich ceramic mixing equipment and technology



Robotic isostatic pressing machine by Frey

Ceramic Mixing Systems

Altech is working with Gustav Eirich GmbH (Eirich), a highly experienced German company that provides advanced ceramic powder mixing and granulation equipment and technology. Eirich will also provide equipment and technology for granulating salt and nickel, essential for battery cathodes. Eirich has a strong reputation, having worked with Fraunhofer before, making them a trusted partner in Altech's battery plant.

CERENERGY® Battery Project site layout, Saxony, Germany

Green Ceramic Cell Production

Frey Systeme GmbH (Frey) will provide isostatic machines for producing green ceramic tubes using alumina powder. Frey's advanced technology enables high-speed filling of rubber moulds and applies high pressure to produce green tubes. With robotic technology, this will achieve a remarkable production rate of one tube every 45 seconds.

Sintered Ceramic Cell Production

Altech is working with Riedhammer GmbH (Riedhammer), a world leading German kiln plant provider, who will provide a tunnel kiln for sintering of ceramic tubes, employing a heating profile of approximately 35 hours. Riedhammer will prioritise the use of renewable electricity during the sintering process, achieving a temperature of 1600°C. With two tracks, this will accomplish the required production rate.

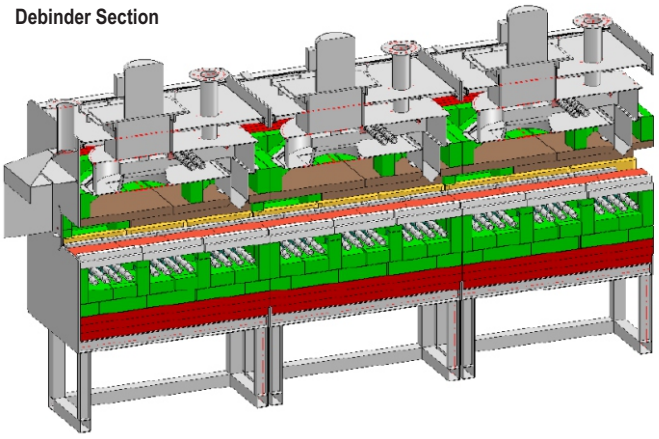
Cell Quality Checks

Altech is working with Xenon Automation GmbH (Xenon) to implement comprehensive quality checks for completed sintered ceramic tubes, ensuring that there are no cracks or faults. Xenon's technology will involve optical and ultrasonic tests to detect faults. Additionally, Xenon has designed the initialisation process for completed cells, which involves subjecting them to a full charge and discharge cycle.

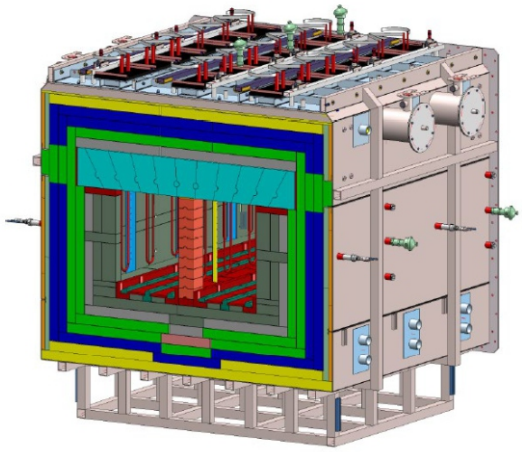
Cell Filling and Assembly

Fritz Automation GmbH (Fritz) has been chosen as the supplier for the cell assembly plant that encompasses various tasks such as tube cutting, ceramic ring assembly, ceramic to cell case assembly, electrode assembly and welding, cathode granules and medium filling, as well as cell and battery pack assembly. Fritz will also provide systems for cell initialisation and performance testing. Fritz have designed the advanced automation systems which will ensure efficient and precise execution of each step of the cell assembly process.

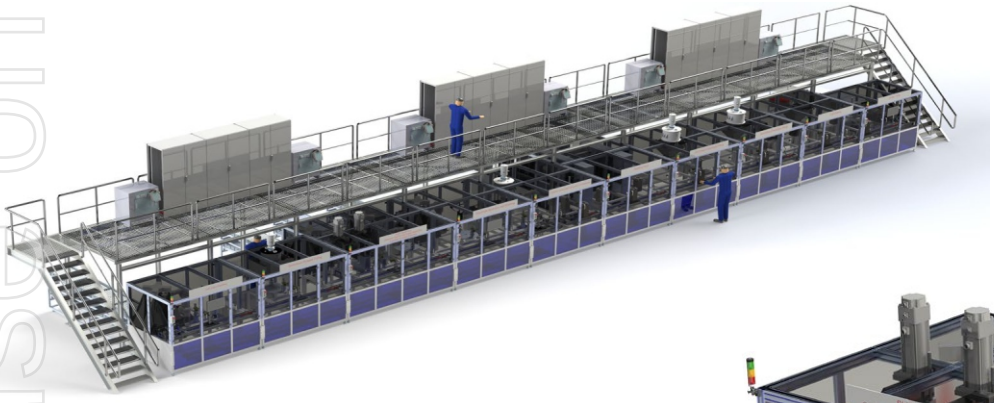
Debinder Section

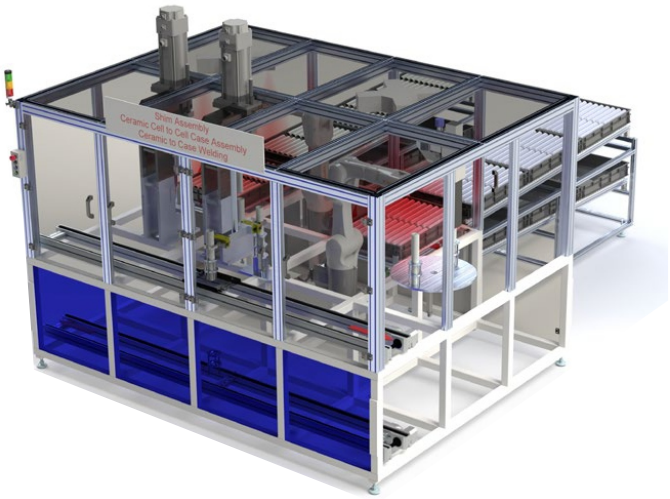


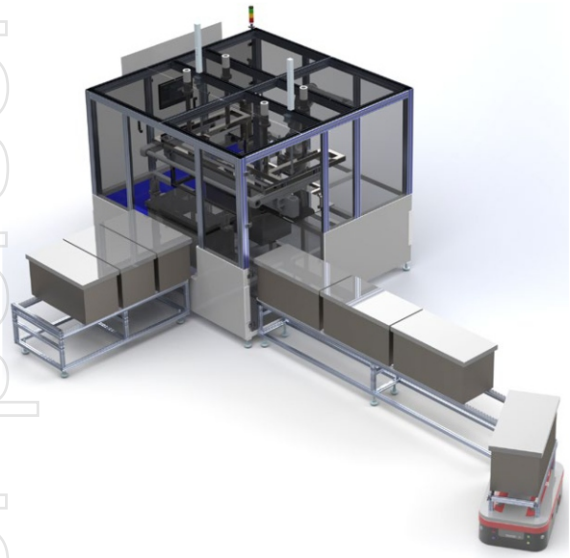
Sinter Section

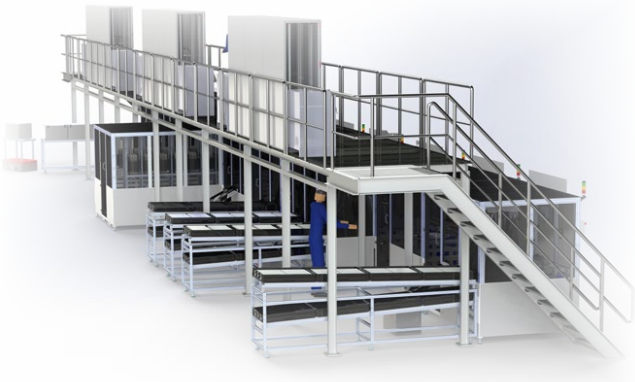


Typical cross section of tunnel kiln technology to be used









Cell Assembly systems to be provided by Fritz Automation

Battery Connections

Altech is working with **Hofer Powertrain GmbH** (Hofer), a leading German supplier of connector plates used for battery busbar connections and wire connections. Hofer's expertise lies in designing and manufacturing efficient and reliable solutions for battery cell mounting. With its advanced connector plate technology, Hofer Powertrain will help secure and seamless connections between battery cells.

Battery Casing

König Metall GmbH has been chosen as the supplier for the insulated battery pack cases for the 60 kWh battery packs. These battery packs offer excellent insulation, ensuring that the exterior remains safe to touch. The cases are designed to IP 65 standards, which allow the batteries to operate in all weather conditions. The metal casings are designed for BMS and connector wiring at the bottom of each unit.

Cell Initialization

For the cell initialisation and subsequent performance testing of completed battery cells, **Dresden Elektronik GmbH** have been selected to provide the automation and robotics around this manufacturing step. The unit is designed to efficiently collect test data and perform charge and full discharge cycles to ensure the proper functioning of the cells. Tracking of each individual cell during the manufacturing process is critical to the proposed battery facility.

Battery Management Systems

Altech has partnered with IAV Global GmbH to provide an advanced Battery Management System (BMS) design for its 60 kWh battery pack and 1 MWh GridPack. The BMS allows seamless integration with site panel software control and enables remote operation when connected to customer grid control systems. It ensures optimal performance and safety of the battery packs and provides users with efficient management and monitoring capabilities. The proposed BMS design also offers remote control capabilities, optimising energy storage and utilisation based on real-time demand and supply dynamics.

1 MWh GridPack Iso-container

Altech has Mein Lagerraum³ GmbH for the fabrication of the specially designed iso-container frame to house the eighteen (18) 60 kWh battery packs that make up the 1 MWh GridPack (ABS 1000). The open style high cube sea container frame is designed for easy transport and simple site installation. The GridPacks will be assembled on site and then undergo a complete charge and discharge cycle before shipping to customers. These frames are being accredited for use.

Plant Electrics and Control Systems

Leadec Automation & Engineering GmbH has been appointed as the contractor to provide advanced electric and automation solutions for the battery plant. This will include intranet equipped control centres and local operation systems, allowing for centralised monitoring and control of operations. In addition, a SCADA real-time live system, ensuring real-time data acquisition, visualisation, and control will be incorporated. Track and trace functionality along with batch identification will be the key feature of the battery plant.

Layout, Architecture and Permitting

Altech appointed ARIKON Infrastruktur GmbH (Arikon) to manage the building designs, approval process and site infrastructure requirements for the battery facility. Additionally, Arikon is responsible for ensuring that site infrastructure meets all requirements for the construction, operation, and maintenance of the battery facility. Arikon was the infrastructure contractor for the Tesla Gigafactory in Brandenberg, Germany.

EPCM Contractor

Leadec Automation & Engineering GmbH (Leadec) has been chosen as the lead engineer for the Definitive Feasibility Study and possibly the EPCM contractor during the build of the CERENERGY® 100MWh Sodium Chloride Solid State Battery project. Leadec is a leading global service specialist for factories across the entire life cycle and related infrastructure. For 60 years, the German company has been supporting customers in the manufacturing industries; from planning, installation, and automation of the factories.

Managing Director Iggy Tan was extremely pleased with the progress of the CERENERGY® Battery Project Workshops and stated *"The level of excellence exhibited by the German plant unit suppliers we have brought together is truly remarkable. They possess extensive expertise in manufacturing plants that prioritise automation and robotics as essential components of the design. Our objective is to manufacture battery cells from the ground up, encompassing the production of ceramic solid-state tubes, full cell assembly, and conducting quality and battery performance checks at one every 45 seconds. We have made substantial progress in our design endeavours and are currently transitioning towards obtaining the final cost estimates for the plant. Given our exclusive rights to this technology, all our design efforts will pave the way for our future success".*

Great Progress at German Silumina Anodes™ Pilot Plant

Altech provides an update on its cutting-edge Silumina Anodes™ pilot plant project in Saxony, Germany, as well as the Definitive Feasibility Study for the planned Silumina Anodes™ 10,000tpa plant.

The Company has made significant progress in incorporating high-capacity high-purity alumina-coated silicon and graphite in lithium-ion batteries, and recently concluded a Preliminary Feasibility Study for the construction of a 10,000tpa Silumina Anodes™ plant in Saxony, Germany, that boasts an impressive NPV of US$507M. As Altech races to bring its patented technology to market, it has commenced construction of a pilot plant adjacent to the proposed project site to facilitate the qualification process for its Silumina Anodes™ product.

A YouTube video update of the pilot plant can be viewed at https://youtu.be/IRWCDLx6UTI

The construction of the Silumina Anodes™ pilot plant is progressing well and according to plan. The front end of the pilot plant, also known as the wet circuit, is making excellent progress, with power supply, laboratory, building modifications, and front-end wet circuit infrastructure completed. The pilot plant is located in an existing building in Dock3 at Schwarze Pumpe, Germany, and the necessary building modifications and electrical panel infrastructure construction were completed in the previous quarter.

The on-site laboratory has been established and is currently going through commissioning. This development is a significant step towards enabling Altech to conduct necessary testing and analyses of the Silumina Anodes™ product. Additionally, the Company has established an on-site glove box, which will facilitate 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.

While fabrication of the back-end of the pilot plant, including the coating equipment, dryer, and calciner (with longer lead times), is currently underway in South Africa and Europe, Altech is expediting the production of some back-end items like silicon carbide linings. The Company anticipates that the final items will be installed and commissioned by end of Q3 this year.

According to Managing Director Iggy Tan, the advancements made on the Silumina Anodes™ pilot plant are highly promising, especially considering its crucial role in supplying customer samples. Iggy Tan emphasised that the primary goal of the pilot plant is to offer product for customer testing, which has generated significant interest in the market. He praised the diligent efforts of Altech's German team, that are working tirelessly to commission the pilot plant and commence production of commercial samples.

Altech Batteries Interactive Investor Hub

Engage with Altech directly by asking questions, watching video summaries and seeing what other shareholders have to say about this, as well as past announcements, at our Investor Hub **https://investorhub.altechgroup.com**

Schwarze Pumpe
Industrial Site
Saxony, Germany

Location of
~14Ha Industrial Site
Saxony, Germany

Altech Batteries
Limited

QUARTERLY REPORT

June 2023

Company Snapshot

Altech Batteries Limited (ASX:ATC) (FRA:A3Y)
ABN 45 125 301 206

FINANCIAL INFORMATION

(as at 30 June 2023)

Share Price:	$0.087
Shares:	1,426.7m
Options:	-
Performance Rights:	120.8m*
Market Cap:	$124m
Cash:	$3.6m

DIRECTORS

Luke Atkins	Non-executive Chairman
Iggy Tan	Managing Director
Peter Bailey	Non-executive Director
Dan Tenardi	Non-executive Director
Tunku Yaacob Khyra	Non-executive Director
Uwe Ahrens	Alternate Director
Hansjoerg Plaggemars	Non-executive Director

CHIEF FINANCIAL OFFICER & COMPANY SECRETARY

Martin Stein

HEAD OFFICE

Suite 8, 295 Rokeby Road, Subiaco,
Western Australia, 6008 T +61 8 6168 1555

info@altechgroup.com

www.altechgroup.com

*subject to vesting conditions

FORWARD-LOOKING STATEMENTS

This announcement contains forward looking statements that involve a number of risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this announcement. The forward-looking statements are made as at the date of this announcement and the Company disclaims any intent or obligation to update publicly such forward looking statements, whether as the result of new information, future events or results or otherwise.

COMPETENT PERSONS STATEMENT

The information in this announcement that relates to Mineral Resources at the Kerrigan Project is based on information reviewed by Ms Sue Border. Ms Border is the Principal Advisor of Geos Mining and is a Fellow of the Australasian Institute of Mining and Metallurgy. Ms Border has sufficient experience that is relevant to the style of mineralisation under consideration to qualify as a Competent Person as defined in the 2012 Edition of the "Australasian Code for Reporting on Exploration Results, Mineral Resources and Ore Reserves". Ms Border consents to the inclusion in this announcement of the matters based on the information in the form and context in which it appears.

SCHEDULE OF TENEMENTS

As per ASX Listing Rule 5.3.3, the Company held the following tenements (exploration and mining leases) as at 30 June 2023:

Tenement ID	Registered Holder	Location	Project	Grant Date	Interest end of quarter
E70/4718-I	Canning Coal Pty Ltd	WA Australia	Kerrigan	01/12/2015	100%
M70/1334	Altech Meckering Pty Ltd	WA Australia	Meckering	19/05/2016	100%

RELATED PARTY TRANSACTIONS (APPENDIX 5B – ITEM 6.1)

The amount shown in the item is for the payment of directors' fees (inclusive of superannuation, where applicable), to the Company's Managing Director, Non-Executive Directors and Alternate Director, during the quarter.

Authorised by: Iggy Tan (Managing Director)

Appendix 5B

Mining exploration entity or oil and gas exploration entity quarterly cash flow report

Name of entity	
ALTECH BATTERIES LTD	
ABN	**Quarter ended ("current quarter")**
45 125 301 206	30 June 2023

	Consolidated statement of cash flows	**Current quarter $A'000**	**Year to date (12 months) $A'000**
1.	**Cash flows from operating activities**		
1.1	Receipts from customers	-	-
1.2	Payments for		
	(a) exploration & evaluation	-	-
	(b) development	-	-
	(c) production	-	-
	(d) staff costs	(892)	(3,262)
	(e) admin and corporate costs	(1,367)	(5,539)
1.3	Dividends received (see note 3)	-	-
1.4	Interest received	70	235
1.5	Interest and other costs of finance paid	(57)	(57)
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	-	307
1.8	Other (provide details if material)	-	35
1.9	**Net cash from / (used in) operating activities**	**(2,246)**	**(8,281)**

2.	**Cash flows from investing activities**		
2.1	Payments to acquire or for:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	(170)	(3,262)
	(d) exploration & evaluation	(11)	(199)
	(e) investment in Altech Advanced Materials AG	-	-
	(f) other non-current assets	(41)	(41)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (12 months) $A'000
2.2	Proceeds from the disposal of:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	-	-
	(d) investments (delayed proceeds from 25% sale of subsidiary Altech Industries Germany Gmbh)	-	5,097
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received	-	-
2.5	Payments for research and development including on CERENERGY battery	(2,208)	(3,749)
2.6	**Net cash from / (used in) investing activities**	**(2,430)**	**(2,154)**

3.	**Cash flows from financing activities**		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	-	-
3.2	Proceeds from issue of convertible debt securities	-	-
3.3	Proceeds from exercise of options	-	-
3.4	Transaction costs related to issues of equity securities or convertible debt securities	-	-
3.5	Proceeds from borrowings (funding received for subsidiary companies from minority shareholders)	878	3,135
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (Lease repayments)	(14)	(58)
3.10	**Net cash from / (used in) financing activities**	**864**	**3,077**

4.	**Net increase / (decrease) in cash and cash equivalents for the period**		
4.1	Cash and cash equivalents at beginning of period	7,381	10,913
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(2,246)	(8,281)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (12 months) $A'000
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(2,430)	(2,154)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	864	3,077
4.5	Effect of movement in exchange rates on cash held	2	16
4.6	**Cash and cash equivalents at end of period**	**3,571**	**3,571**

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter $A'000	Previous quarter $A'000
5.1	Bank balances	3,541	7,351
5.2	Call deposits	30	30
5.3	Bank overdrafts	-	-
5.4	Other (provide details)	-	-
5.5	**Cash and cash equivalents at end of quarter (should equal item 4.6 above)**	**3,571**	**7,381**

6.	Payments to related parties of the entity and their associates	Current quarter $A'000
6.1	Aggregate amount of payments to related parties and their associates included in item 1	(172)
6.2	Aggregate amount of payments to related parties and their associates included in item 2	-

Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.

7.	**Financing facilities** *Note: the term "facility' includes all forms of financing arrangements available to the entity.* *Add notes as necessary for an understanding of the sources of finance available to the entity.*	**Total facility amount at quarter end $A'000**	**Amount drawn at quarter end $A'000**
7.1	Loan facilities	-	-
7.2	Credit standby arrangements	-	-
7.3	Other (please specify)	-	-
7.4	**Total financing facilities**	-	-

7.5	**Unused financing facilities available at quarter end**	-

7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.

8.	**Estimated cash available for future operating activities**	**$A'000**
8.1	Net cash from / (used in) operating activities (item 1.9)	(2,246)
8.2	(Payments for exploration & evaluation classified as investing activities) (item 2.1(d))	(11)
8.3	Total relevant outgoings (item 8.1 + item 8.2)	(2,257)
8.4	Cash and cash equivalents at quarter end (item 4.6)	3,571
8.5	Unused finance facilities available at quarter end (item 7.5)	-
8.6	Total available funding (item 8.4 + item 8.5)	3,571
8.7	**Estimated quarters of funding available (item 8.6 divided by item 8.3)**	1.58

Note: if the entity has reported positive relevant outgoings (ie a net cash inflow) in item 8.3, answer item 8.7 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.7.

8.8 If item 8.7 is less than 2 quarters, please provide answers to the following questions:

8.8.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?

Answer: Yes.

8.8.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?

Answer: Yes. A share placement for $3,000,000 was completed on 21 July 2023. An Entitlement Offer is also underway, anticipated to be finalised by 14 August 2023

8.8.3	Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?
Answer:	

Note: where item 8.7 is less than 2 quarters, all of questions 8.8.1, 8.8.2 and 8.8.3 above must be answered.

Compliance statement

1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.

2 This statement gives a true and fair view of the matters disclosed.

Date: 28 July 2023

Authorised by: MARTIN STEIN – CFO & COMPANY SECRETARY

On behalf of the Board of Directors

Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.

2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 6: Exploration for and Evaluation of Mineral Resources* and *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standards apply to this report.

3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.

4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [*name of board committee – eg Audit and Risk Committee*]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".

5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.