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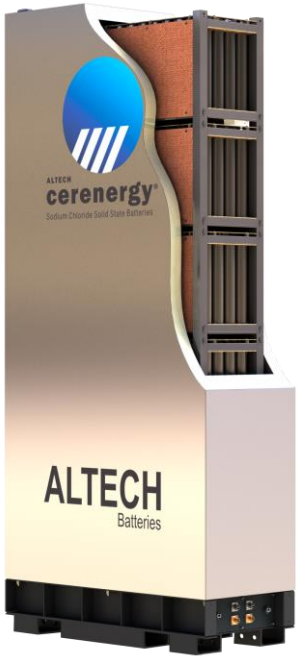
ALTECH – EXCELLENT PROGRESS ON ABS60 60kWh CERENERGY® BATTERY PROTOTYPES

Highlights

- Excellent progress with two 60 kWh battery pack prototypes
- Pilot plant re-design at Fraunhofer IKTS Hermsdorf for prototype manufacture
- All prototype materials have been procured from suppliers
- Ceramic tube manufacture is 50% complete
- Cell assembly progressing well with more than half completed
- Low reject and defect rates experienced
- Two battery vacuum casings delivered and undergoing heat loss testing
- Finalisation of prototypes will be mid 2024



Altech Batteries Limited (Altech/the Company) (ASX: ATC and FRA: A3Y) is providing an update on the advancement of its ABS60 60 kWh CERENERGY® battery prototypes. The manufacturing of two such batteries dedicated to customer performance testing commenced last year. Altech's joint venture partner, German government owned Fraunhofer IKTS, had initially developed battery packs with capacities of 5 kWh and 10 kWh units. However, with the establishment of the joint venture with Altech, a significant upgrade was undertaken, resulting in the transformation of the battery pack into a substantial 60 kWh unit specifically designed for the grid storage market. Production of two of these substantial 60 kWh battery packs was initiated for the purpose of conducting performance tests and qualifying them for customer use.

The pilot line at Fraunhofer IKTS, situated in Hermsdorf, Germany, has undergone a comprehensive redesign to facilitate the manufacturing of 60 kWh battery prototypes. Innovative tools and machinery have been developed and implemented specifically for producing the battery cells required for the 60 kWh prototypes. The battery pack is composed of 240 CERENERGY® cells, each rated at 2.5 V. These cells are organised in 4 rows, each comprising 12 cells, and stacked 5 modules high. The dimensional specifications of the battery packs are 2.6 meters in height, 0.4 meters in length, and 1.0 meter in width. Ensuring adherence to the Ingress Protection (IP) 65 standard, the packs are designed to be dust and weatherproof, reflecting high levels of sealing effectiveness for electrical enclosures.

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All prototype materials have now been procured from specific suppliers. The crucial stages in cell production involve blending ceramic components, high-pressure pressing, tube formation, and ultimately sintering at 1,600 degrees celsius over a span of several days. Fraunhofer IKTS' Hermsdorf pilot plant facility successfully navigated the entire ceramic tube production, with half of the required tubes now manufactured. The battery cathode electrolyte, comprising sodium chloride and nickel powder granules, was produced using the mixing and pelletising equipment at the Hermsdorf pilot plant. The process of cell assembly, encompassing vacuum filling, heating, and welding, is ongoing, resulting in the completion of approximately half of the cells. To facilitate the infiltration of cathode material into multiple battery cells simultaneously, a vacuum chamber was developed. Promising pass results were obtained from laser welding tests on the battery cells conducted at Precitec GmbH & Co. KG

Figure 2 – Production of battery cells at Fraunhofer IKTS Hermsdorf pilot plant facility

In order to confirm the precise alignment of all components following the welding closure of each prototype cell, a thorough examination is conducted using an industrial micro computed tomography (µCT) scanning system. This ensures the verification of filling height, composition, alignment, and the behavior of cathode material post cell initialisation. Upon successful completion of the µCT quality assurance, individual cells undergo charge and discharge performance tests, all of which have demonstrated satisfactory and as expected results thus far. As of now, fifty percent of the necessary cells have been successfully produced, showcasing excellent progress. Reject or defect rates have been low and with expected limits.

Figure 3 – Some of the completed battery cells waiting performance testing

Module Frames and Cell Contacting System (CCS)

Once the cells are finalised, they are integrated into a module frame and welded to the specially crafted Cell Contacting System (CCS). This system, designed by Hofer AG, a supplier for Altech, facilitates pins and bus bar contact with all cells within an electrical isolation frame arrangement. Hofer AG has successfully completed the development of the CCS, delivering the initial prototype designs for the 60 kWh prototypes. Altech and Fraunhofer have meticulously validated all electrical specifications and tolerances of the CCS, and the electrical isolating material has demonstrated reliable performance.

Battery Casing

König Metall GmbH has produced and delivered two casings for the 60 kWh battery houses. Fraunhofer IKTS, situated in Dresden, will furnish the testing racks for charge and discharge cycling to assess the battery performance. Simultaneously, the battery housings are undergoing heating cycles to evaluate the heat loss parameters of the vacuum-insulated casings. Specialised software has been developed to facilitate access to the parameters that the CERENERGY® BatteryPack will furnish during testing. The assembly of cells into the battery housing will be undertaken once all cells are finalised and is expected by the middle of 2024.

Figure 4: Delivery of the battery casing and heat loss testing at Fraunhofer IKTS Dresden

Collaboration with Potential Customers

Once the prototypes are completed, Altech will provide access to the prototypes to select potential customers. This collaboration is aimed at demonstrating the practical applications and benefits of the ABS60 series in various industries, whilst also securing offtake agreements.

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Authorised by: Iggy Tan (Managing Director)

Altech's Interactive Investor Hub

Altech's interactive Investor Hub is a dedicated channel where management interacts regularly with shareholders and investors who wish to stay up-to-date and to connect with the Altech Batteries leadership team. Sign on at our Investor Hub https://investorhub.altechgroup.com or alternatively, scan the QR code below.

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About Altech Batteries Ltd (ASX:ATC) (FRA:A3Y)

CERENERGY® Batteries Project

Altech Batteries Ltd is a specialty battery technology company that has a joint venture agreement with world leading German government battery institute Fraunhofer IKTS ("Fraunhofer") to commercialise the revolutionary CERENERGY® Sodium Chloride Solid State (SCSS) Battery. CERENERGY® batteries are the game-changing alternative to lithium-ion batteries. CERENERGY® batteries are fire and explosion-proof; have a life span of more than 15 years and operate in extreme cold and desert climates. The battery technology uses table salt and is lithium-free; cobalt-free; graphite-free; and copper-free, eliminating exposure to critical metal price rises and supply chain concerns.

The joint venture is commercialising its CERENERGY® battery, with plans to construct a 120 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 cerenergy®
Sodium Chloride Solid State Batteries

Silumina Anodes™ Battery Materials Project

Altech Batteries has licenced its proprietary high purity alumina coating technology to 75% owned subsidiary Altech Industries Germany GmbH (AIG), which has finalised a Definitive Feasibility Study to commercialise an 8,000tpa silicon alumina coating plant in the state of Saxony, Germany to supply its Silumina Anodes™ product to the burgeoning European electric vehicle market.

This Company's game changing technology incorporates high-capacity silicon into lithium-ion batteries. Through in house R&D, the Company has cracked the "silicon code" and successfully achieved a 30% higher energy battery with improved cyclability or battery life. Higher density batteries result in smaller, lighter batteries and substantially less greenhouse gases, and is the future for the EV market. The Company's proprietary silicon product is registered as Silumina Anodes™.

The Company is in the race to get its patented technology to market, and recently announced the results of a Definitive Feasibility Study for the construction of a 8,000tpa Silumina Anodes™ material plant at AIG's 14-hectare industrial site within the Schwarze Pumpe Industrial Park in Saxony, Germany. The European silicon feedstock supply partner for this plant will be Ferroglobe. The project has also received green accreditation from the independent Norwegian Centre of International Climate and Environmental Research (CICERO). To support the development, AIG has commenced construction of a pilot plant adjacent to the proposed project site to allow the qualification process for its Silumina Anodes™ product. AIG has executed NDAs with German and North American automakers and battery material supply chain companies.

Silumina Anodes™