



Altech Chemicals
Limited

ASX ANNOUNCEMENT AND MEDIA RELEASE

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ALTECH – LAUNCH OF CERENERGY® 60KWh BATTERY PACK (ABS60) DESIGN FOR RENEWABLE ENERGY STORAGE MARKET

Highlights

- Launch of ABS60 60 KWh sodium alumina solid state battery pack design
- Rated at 620 Volts and 100 Ah
- Specially designed for renewable energy and grid storage market
- Each ABS60 battery pack contains 240 cells
- Totally weatherproof design for outdoor installation
- Larger ABS60 pack will reduce module assembly and connecting costs

Altech Chemicals Limited (Altech/the Company) (ASX: ATC and FRA: A3Y) is pleased to advise that, in relation to its battery joint venture with Fraunhofer, it has designed and launched the CERENERGY® Sodium Alumina Solid State (SAS) 60 KWh battery pack (ABS60) designed for the renewable energy and grid storage market. Based on preliminary discussions with potential off-takers for the 100MWh CERENERGY® battery project, the proposed battery module for 10 kilowatt-hours (KWh) has been superseded by a 60 kilowatt-hour (KWh) battery pack (ABS60) rated at a higher voltage of 620 volts and 100 amp hour (Ah). A video of the battery design can be seen on Altech web site www.altechchemicals.com or on You tube <https://youtu.be/OHPdGvaOImI>



**ABS60
60 KWh
620 Volts
100 Ah**

On 14 September 2022, Altech announced a JV Agreement with world-leading German battery institute Fraunhofer IKTS ("Fraunhofer") to commercialise Fraunhofer's revolutionary CERENERGY® Sodium Alumina Solid State (SAS) Battery. Altech, together with associated Altech Advanced Material AG, will be the majority owner at 75% of the JV company, which will commercialise a 100 MWh project to be constructed on Altech's land in Schwarze Pumpe, Germany. CERENERGY® batteries are the game-changing grid storage 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 Altech-Fraunhofer joint venture is developing a 100 MWh SAS battery plant (Train 1) on Altech's site in Saxony, Germany specifically focussed on the grid (stationary) energy storage market

The ABS60 battery pack will consist of 240 CERENERGY® cells (rated at 2.5 V each) arranged in 4 rows of 12 cells, and 5 cell modules high. The battery packs will have a dimension of 2.6m high, 0.4m long and 1.0m in width. The packs are designed for Ingress Protection (IP) 65 standard (levels of sealing effectiveness of electrical enclosures) which means that they will be dust and weatherproof. The battery packs can be installed outdoors in all weather conditions. Since the CERENERGY® batteries can operate at a very wide temperature range, minus (-) 40 deg C to plus (+) 60 deg C, the battery pack will be ideal for the cold European climates. In addition, being fire-proof, the ABS60 battery packs will be safe to installed indoors where lithium-ion batteries are prohibited.

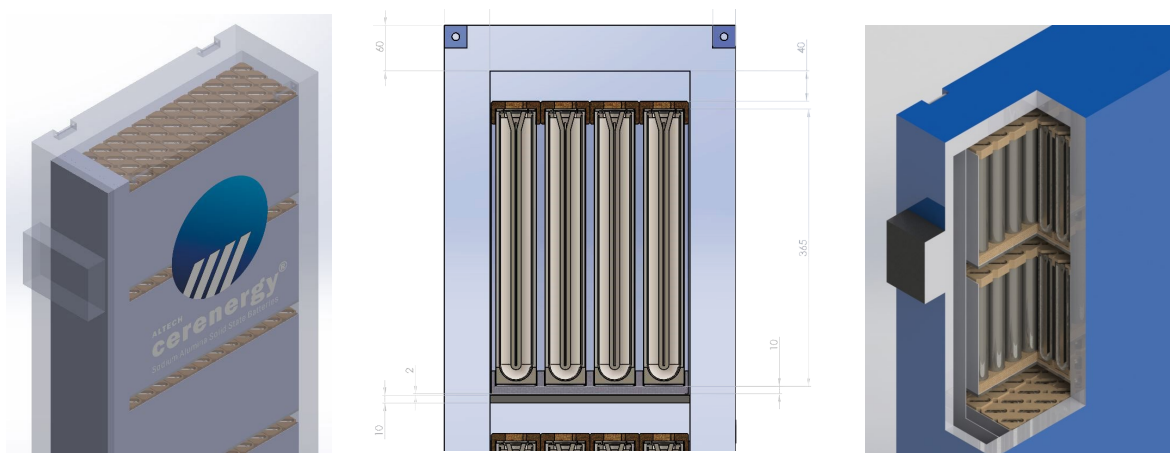


Figure 1 – Cross section of the ABS60 battery pack showing cell configuration

The benefit of the larger ABS60 battery pack is that it will allow more efficient installation in renewable energy storage and grid storage applications. The larger packs will reduce module assembly casing and connecting costs. There is a cost advantage of using one Battery Management System (BMS) processor versus six BMS processors for the previously envisaged individual 10 KWh modules. The fuse and disconnectors will also be reduced by the same factor for a larger 60 KWh battery.

The battery plant will now be designed to produce ABS60 battery packs as a standard product to meet Europe's renewable energy and grid storage market. Fraunhofer have previously estimated that the cost of producing CERENERGY® batteries should be in the region of 40% cheaper than lithium-ion batteries, primarily due to not requiring lithium, graphite, copper or cobalt. This will be confirmed in the Bankable Feasibility Study that Altech is currently undertaking.

Renewable Energy and Grid Storage Applications

Renewable energy is being deployed around the globe. A new report shows renewable energy sources were used to meet the rise in global electricity demand in the first half of 2022. Forecast reports also show that the grid storage market is expected to grow by 28% CAGR in the coming decades. The global battery energy storage systems 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. SAS batteries can provide high security at low acquisition and operating costs for stationary energy storage market.

Combining wind and solar with battery storage offers many advantages. The Wheatridge Renewable Energy Project in Oregon is a typical example of how combining renewable energy sources with battery storage can help provide reliable, sustainable energy as utility companies look to reduce carbon emissions. In these kind of applications, large battery systems are installed close to solar and wind farms. Typically, lithium-ion batteries have largely been used by utilities to store renewable energy when the sun sets or the wind stops blowing. However, existing utility-scale storage can only discharge energy for up to four hours at a time, meaning that systems aren't able to provide widespread power for a longer period of time (eg: over the night period). There is a need for middle and long-duration batteries that provide sustained power for longer periods.



ABS60 CERENERGY® Battery Packs ideally suited for Renewable Energy Storage

Altech's CERENERGY® ABS60 battery packs are designed to fill this gap. The newly designed Altech ABS60 battery packs are expected to take approximately 6 hours to charge and discharged over a similar period. However, they have the capacity to discharge quicker, in less than 3 hours if required. These battery packs' charging and discharge characteristics match closely the power generation patterns of the sun. The Altech design team will be advancing heat transfer modelling and optimising insulation design next.

Altech Chemicals 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.altechchemicals.com>

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

CERENERGY® Batteries Project

Altech Chemicals Ltd is a specialty battery technology company that has a joint venture agreement with world leading German battery institute Fraunhofer IKTS ("Fraunhofer") to commercialise the revolutionary CERENERGY® Sodium Alumina Solid State (SAS) 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 100MWh 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.



Silumina Anodes™ Battery Materials Project

Altech has licenced its proprietary high purity alumina coating technology to 75% owned subsidiary Altech Industries Germany GmbH (AIG), which has commenced a definitive feasibility study for the development of a 10,000tpa silicon/graphite alumina coating plant in the state of Saxony, Germany to supply its Silumina Anodes™ product to the burgeoning European electric vehicle market.

This Company recently announced its game changing technology of incorporating 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 graphite 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 preliminary feasibility study (PFS) for the construction of a 10,000tpa Silumina Anode™ material plant at AIG's 14-hectare industrial site within the Schwarze Pumpe Industrial Park in Saxony, Germany. The European graphite and silicon feedstock supply partners for this plant will be SGL Carbon and 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 two German automakers as well as a European based battery company.



HPA Production Project

Altech is also further aiming to become a supplier of 99.99% (4N) high purity alumina (Al₂O₃) through the construction and operation of a 4,500tpa high purity alumina (HPA) processing plant at Johor, Malaysia, and has finalised Stage 1 and Stage 2 construction of its HPA plant in Johor, Malaysia. Feedstock for the plant will be sourced from the Company's 100%-owned near surface kaolin deposit at Meckering, Western Australia and shipped to Malaysia. The HPA project is significantly de-risked with a bankable feasibility study completed, senior lender project finance from German government owned KfW IPEX-Bank approved, and a German EPC contractor appointed – with initial construction works at the site completed. In addition to the senior debt, conservative (bank case) cash flow modelling of the HPA plant shows a pre-tax net present value of USD 505.6million at a discount rate of 7.5%. The project generates annual average net free cash of ~USD76million at full production. Altech is in the final stages of project finance with a potential raising of US\$100m of secondary debt via the listed green bond market. In addition, US\$100m of project equity is being sought through potential project joint venture partners.