Altech Chemicals
Limited

QUARTERLY REPORT

September 2022

To Commercialise 100MWh Sodium Alumina Solid State Batteries for Grid Storage

- Majority ownership (75%) of a joint venture with Fraunhofer IKTS
- 100 MWh Sodium Alumina Solid State (CERENERGY®) battery project in Saxony
- IKTS developed the technology over 8 years and is ready to commercialize
- €35 million spent on R&D and €25 million on operating pilot plant
- CERENERGY® batteries are fire and explosion proof
- Operates in extreme cold and desert climates
- Ultra-long life sometimes twice the lifespan of lithium-ion batteries
- Uses common salt instead of expensive lithium
- Lithium-free, graphite-free, copper-free, and cobalt free
- Pure solid-state technology for the electrolyte

Silumina Anodes™ Project Update

- Pilot plant implementation is well underway
- Procurement of pilot plant equipment is well advanced
- Long lead equipment already ordered
- Required building modifications and panel installation commenced in July 2022
- German Federal Chancellor Olaf Scholz visited Schwarze Pumpe site
- Altech's Silumina Anodes™ project was briefly introduced to the Chancellor
- Altech to present Silumina Anodes™ technology to Chancellery in Berlin

Strategic Partnership with Fraunhofer IKTS for Silumina Anodes™ Qualification

- Fast track Silumina Anodes™ product qualification with Fraunhofer IKTS
- Fraunhofer IKTS is a world-renowned battery materials and battery performance research centre in Germany
- Independent performance testing and qualification of Silumina Anodes™ product will assist early market entry
- Fraunhofer IKTS has expressed potential for Silumina Anodes™ battery material

Expansion of Research Laboratories for Pouch Cell Batteries

- Expansion of Altech's Research and Development Laboratories in Perth
- Capability of manufacturing full-sized pouch cells batteries
- Scale-up anode material production with an additional tube furnace

Update of High Purity Alumina Project

- KfW IPEX-Bank continues to be in full support of the Company's Malaysia HPA project
- German Government Export Credit Agency Euler Hermes extends US$170m loan cover
- EPC contractor SMS group reiterates support of the HPA project
- Work continues on US$144m Green Bond offer
- Project level equity funding is being advanced by US based DelMorgan

Annual General Meeting

- The Company's AGM is being held on 30 November 2022 and all shareholders are invited to attend
- Documentation in relation to the AGM was despatched to shareholders in the week commencing 24 October 2022

ALTECH CHEMICALS LIMITED
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To Commercialise 100MWh Sodium Alumina Solid State Batteries for Grid Storage

Altech announced that it has executed a Joint Venture Shareholders' Agreement with world-leading German battery institute Fraunhofer IKTS ("Fraunhofer") to commercialize Fraunhofer's revolutionary CERENERGY® Sodium Alumina Solid State (SAS) Battery. Altech, inclusive of associated entity Altech Advanced Materials AG, will be the majority owner at 75% of the JV company, which will commercialize a 100 MWh project to be constructed on Altech's land in Schwarze Pumpe, Germany. The SAS CERENERGY® battery uses common table salt and ceramic solid-state technology.

SAS CERENERGY® BATTERIES

Altech believes that Sodium Alumina Solid State (SAS) 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 nickel - is lithium-free; cobalt-free; graphite-free; and copper-free, eliminating exposure to critical metal price rises and supply chain concerns.

For more information on the advantages of CERENERGY® batteries watch the following YouTube video **https://youtu.be/UBwxxgEJHvo**

The SAS technology has been developed by Fraunhofer IKTS over the last eight years and has revolutionized previous technology, allowing higher energy capacity and lower production costs. SAS-type batteries, in terms of capacity, have already been successfully tested in stationary battery modules. The Fraunhofer SAS batteries are in the final phase of product testing and ready to commercialise. Fraunhofer has spent in the region of EUR 35 million on research & development and operates a EUR 25 million pilot plant in Hermsdorf, Germany. The final CERENERGY® battery modules are specially designed for the grid storage market and have been undergoing extensive performance testing in Germany. These modules are designed to fit in racks housed in sea containers that can be deployed for grid storage.

For more information on the Fraunhofer CERENERGY® pilot facility and final battery modules watch the following YouTube video **https://youtu.be/UBwxxgEJHvo**

Fraunhofer was seeking an entrepreneurial partner that has German land available, has access to funding, is a builder of projects, has battery background, and has technology in alumina used in ceramics. Altech fitted the criteria, and the Joint Venture Shareholders' Agreement was executed. Altech group will own 75% of the project with IKTS 25% free carried. The intellectual property will be licensed exclusively to the joint venture.

The joint venture partners have elected to develop a 100 MWh SAS battery plant (Train 1) on Altech's site in Saxony, Germany. The target market for this project will specifically focus on the grid (stationary) energy storage market which is expected to grow by 28% CAGR (Compound Annual Growth Rate) in the coming decades. 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, the market is expected to grow from 20 GW in 2020 to over 3,000 GW by 2050. Altech believes that SAS batteries can provide high security, at low acquisition and operating costs, for the stationary energy storage market.

Fraunhofer has estimated that the total cost of production for CERENERGY® batteries will be 40%-50% cheaper than lithium-ion batteries.

The joint venture partners have commenced the planning process for the Bankable Feasibility Study required for the commercialisation process. Once the Train 1 (100 MWh) plant is built and operating, the longer-term vision for the joint venture is to construct additional trains or a Gigawatt battery facility.

Challenges with Lithium-ion batteries Fire and Explosion Issues

One of the significant drawbacks of lithium-ion batteries is the risk of thermal runaway, fire, and explosion which have been largely in the news recently. Today's lithium-ion battery contains flammable liquid electrolyte and plastic separators which is the major contributing problem to fire risk. Thermal runaway is a chain reaction within a battery cell that can be very 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, and overcharging.

Narrow Operating Temperature Range

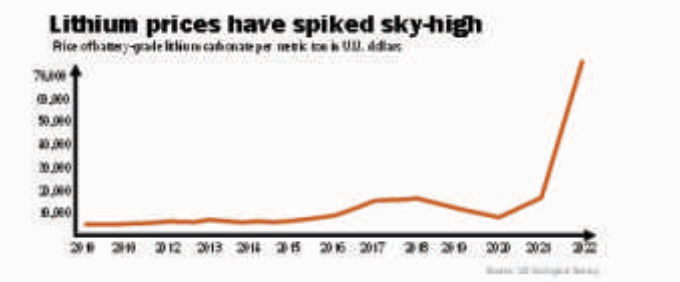
The other drawback of lithium-ion batteries is that they are required to operate in a relatively narrow temperature range which is between +15°C to +35°C. At lower temperatures, the liquid electrolyte in the battery becomes more viscous which slows the lithium transfer and reactions. A lithium battery at 0°C will reduce a typical battery capacity down to 70%. At higher temperatures, the battery is prone to overheating and requires external cooling to maintain battery efficiency. This makes the application of lithium-ion batteries in cold and desert climates extremely challenging.

Lithium-ion Battery Lifespan

Thirdly, the life of lithium-ion batteries is still limited to between 7-10 years depending on applications. Lithium-ions degrade 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. For electric vehicles (EVs), manufacturers will guarantee a battery for around 8 years when the capacity of the battery drops below 70%. For grid storage batteries, a life span of 7-10 years can be expected. There is still an expectation in the market for a longer battery life span which will help lower the overall long-term unit storage costs in grid storage.

Lithium Costs and Availability

The global market for the alkali metal lithium is growing rapidly. The price of lithium, which is the most critical component of a lithium-ion battery, has risen six-fold since the start of the year. Lithium prices have spiked sky high, 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. There is a real concern that there aren't enough mines and production capacity being developed to meet the forecast demand for both EVs as well as the stationary energy storage market.



Cobalt Supply Chain and Ethical Concerns

Cobalt is key for boosting energy density and battery life in lithium-ion batteries because it keeps the cathode layered structure stable during lithium migration and battery operation. Cobalt is considered the highest material supply chain risk for electric vehicles (EVs) in the short and medium term. EV batteries can have up to 20 kg of cobalt in every 100 kilowatt-hours (kWh) pack. The Democratic Republic of Congo (DRC) produces about 70 percent of global cobalt and the LIB industry is exposed to precarious supply chain issues. Stories of the harsh and dangerous working conditions, child labour, and human rights abuses in the DRC have caused ethical concerns about cobalt supply.

Graphite Geo-political Risk

Graphite is thus considered indispensable to the global shift towards electric vehicles. It is also the largest component in lithium-ion batteries by weight, with each battery containing 20-30% graphite. But due to losses in the manufacturing process, it takes 30 times more graphite than lithium to make the batteries. The graphite deficit has started as demand for EV battery anode ingredient exceeds supply, resulting in price increases. Today, China produces 90% of the world graphite anode material which represents a concerning geo-political risk to the industry.

Copper Crunch

Copper is mainly used as the current collector on the anode part of a lithium-ion battery. Copper is looming as the biggest worry, with the biggest driver of scarcity being the energy transition and increased EV demand. A recent report (Future of Copper) notes: “The 2050 climate objectives will not be achieved without a significant ramp-up in copper production in the near and medium term, which will be very challenging.” An electric vehicle battery requires 2.5 times more copper than a standard ICE vehicle. The report notes that there simply aren't enough copper mines being built or expanded to provide all the copper needed to produce the 27 million EVs that S&P Global has forecast to be sold annually by 2030. Copper could rival oil as a national energy security concern for some countries.

The Ideal Battery?

Based on the above challenges facing lithium-ion batteries and the increasing prices of the critical materials and metals used in these batteries, the industry has been searching for a battery technology that resolves these problems. A battery that is fire and explosion proof, has a lifespan of more than 15 years, and operates in cold and desert climates. A battery technology where it is lithium free, cobalt free, graphite free and finally copper free, which limits the exposure to critical materials prices rises and supply chain concerns. Altech believes that SAS CERENERGY® batteries resolve some of the biggest problems and challenges facing lithium-ion batteries today. SAS CERENERGY® batteries are not designed to replace the successful lithium-ion batteries, but provide an ideal alternative for the stationary storage market.

ALTECH
cerenergy®
Sodium Alumina Solid State Batteries

SAS cell with positive and negative terminal individual cell rated at 2.58 V each

FIRE PROOF ✓

SAS Batteries are Fire and Explosion Proof

SAS batteries are totally fire and explosion proof and are not prone to thermal runaway - one of the biggest advantages over lithium-ion batteries. Firstly, SAS batteries do not contain flammable liquid electrolyte or plastic separators; the electrolyte is a solid inflammable ceramic tube that allows sodium ions to transfer through it. Secondly, the battery, due to its chemistry does not contain oxides nor generate oxygen at the cathode like a lithium-ion battery does during thermal runaway. Being a much safer battery, it is ideal in indoor industrial and commercial energy storage installations. The battery is totally safe and does not react with water and is highly sort after for sensitive environments e.g. areas subject to flooding, where lithium-ion batteries are banned from these applications.

LARGE TEMPERATURE RANGE ✓

Large Operating Temperature Range - Cold and Desert climates

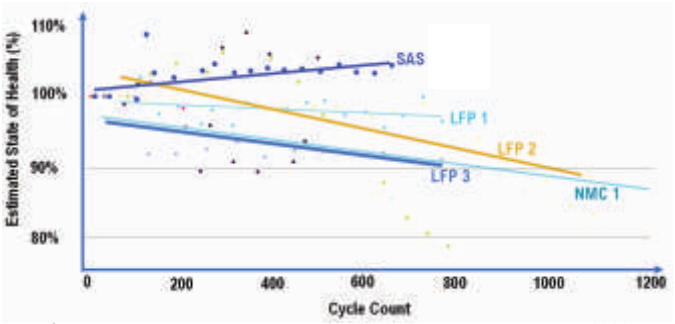
SAS batteries can operate efficiently between minus 20°C to +60°C range and guarantee high performances and durability regardless of the ambient temperature. Because the SAS battery has no liquid electrolyte (instead solid ceramic electrolyte), ambient temperature does not adversely affect the performance of the battery. In addition, the SAS batteries are internally high temperature batteries (operates at 270-350°C) but are fully insulated so the external of the battery module is at touch temperature. The core temperature of the battery is self-sustaining and does not require cooling like lithium-ion batteries. They are ideal grid energy storage for cold and desert climates which is the main disadvantage of the lithium-ion batteries. For this reason, the SAS battery has its own specific market without any competition from lithium-ion batteries.

>15 YEARS LIFE ✓

SAS Battery Life Span

Unlike lithium-ion batteries, there is no sodium ion degradation with each charge and discharge. There is no first cycle loss, no detrimental side reactions, no 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 an SAS battery is beyond 15 years. In a recent study by ITP Renewables, the SAS type battery did not show any deterioration in estimated state of health in the first 700 cycles of testing, compared with the normal deterioration in LFP and NMC lithium-ion batteries. SAS type batteries have been reported with lifetimes of over 2,000 cycles and twenty years has been demonstrated with full-sized batteries, and over 4,500 cycles and fifteen years with 10 and 20-cell modules.

Life span testing of various batteries including SAS-type batteries



Source: ITP Renewables Public Report 11 Lithium-ion Battery Testing 2021

LITHIUM FREE ✓

Lithium Free Battery

SAS batteries do not contain lithium but use sodium ions from common table salt. In fact, the cathode consists of common salt (sodium chloride) and nickel. Sodium is the next reactive alkali metal on the periodic table under lithium (Li is -3.05 V whilst Na is -2.7 V) and is equally ideal for energy storage in batteries. Salt is not a critical element, is many times cheaper than lithium and is readily available everywhere. SAS technology is different from sodium-ion batteries or sodium sulphur batteries. SAS batteries are not exposed to rising lithium prices and potential supply constraints of lithium globally.

COBALT FREE ✓

Cobalt Supply Chain and Ethical Concerns

No cobalt is used in an SAS battery. As mentioned previously, the cathode consists of salt and nickel in a sodium aluminium chloride medium. Due to the chemistry of the battery, there is no requirement for a cathode layered structure like lithium-ion batteries so there is no requirement for cobalt. SAS batteries have no exposure to cobalt's ethical or supply chain issues. SAS batteries have excellent specific energy of 110-130 Wh/kg compared to LFP lithium-ion battery of 90-160 Wh/kg.

GRAPHITE & COPPER FREE ✓

Graphite and Copper Supply Risks

The other unique feature of the SAS battery is that it does not contain any graphite or copper in the anode side of the battery. In fact, there is no anode in the SAS battery. The anode only forms during the charging process as a molten sodium film between the steel electrode and outer edge of the ceramic electrolyte. Similarly, the molten sodium anode dissolves during the discharging process of the battery. Instead of copper as the negative collector in the lithium-ion battery, a steel canister acts as the negative electrode in a SAS battery. The SAS battery is graphite-free and copper-free.

Ceramic solid-state electrolyte at Fraunhofer IKTS pilot facility - SAS cells in battery module

What is a CERENERGY® battery?

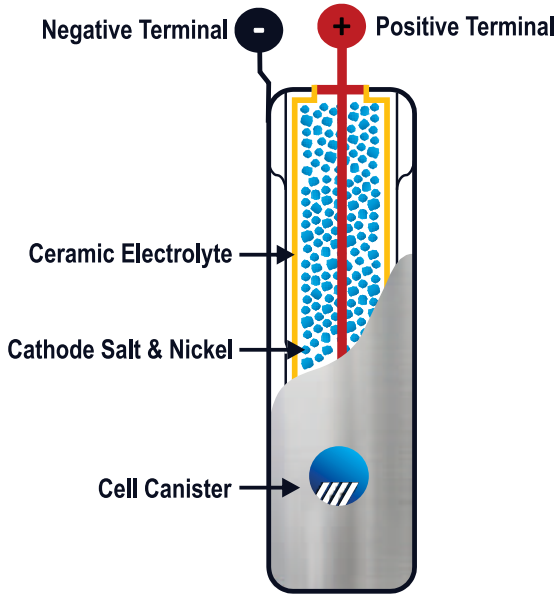
A CERENERGY® battery consists of a ceramic tube (conductive to sodium ions but insulator for electrons) with a positive terminal in the center of it. The solid ceramic tube (solid state technology) performs the same function as a liquid electrolyte in a lithium-ion battery, allowing sodium ions to transfer through it. Fraunhofer has developed solid-state technology to produce these large solid ceramic tubes with micro-structures that 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 a sodium aluminium chloride medium.

The ceramic tube is housed in a steel canister which acts as the negative terminal. The positive and negative terminal tabs are installed at the top of the cell for electrons transfer and connection to other cells. Each cell operates at 2.58V and cells are installed in a refractory insulated module casing. The technology highlights for CERENERGY® batteries are high specific energy; excellent performance and cycle life in harsh operating environments; ultra-long battery life span and low environmental impact.

How the Battery Works

When the CERENERGY® battery is being charged, electrons flow from the positive terminal to the negative terminal. Sodium ions from the salt (sodium chloride) migrate through the solid ceramic electrode towards the negative canister terminal. The remaining chloride ions attach themselves to the nickel to form nickel chloride in the cathode medium. The sodium forms a molten anode layer on the outside of the ceramic tube, contacting the steel canister, and the battery is fully charged. During discharge, electrons flow back, molten sodium is oxidized into Na+ ions, and transferred back through the solid-state ceramic tube forming sodium chloride. Nickel chloride is reduced back to metallic Nickel.

The electrochemical reaction of the battery is as follows:



Components of CERENERGY® battery

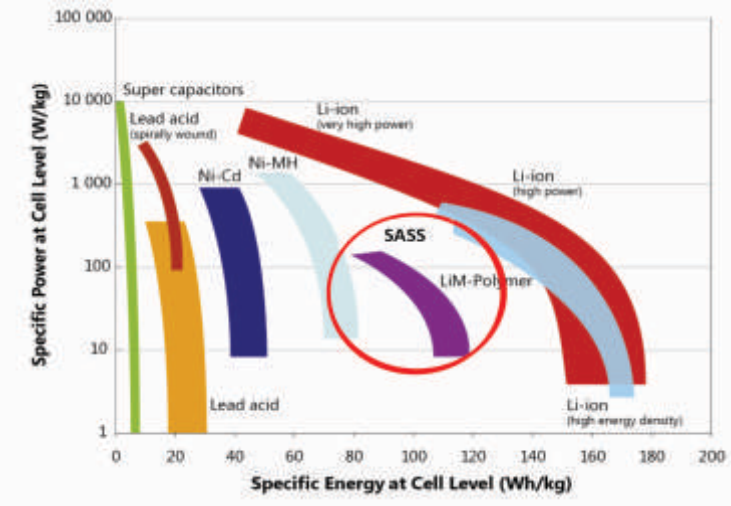
Cross section of CERENERGY® Battery

For more information on how the Fraunhofer IKTS CERENERGY® works watch the following you tube video **https://youtu.be/Qb22Ccji-B0**

Energy Density

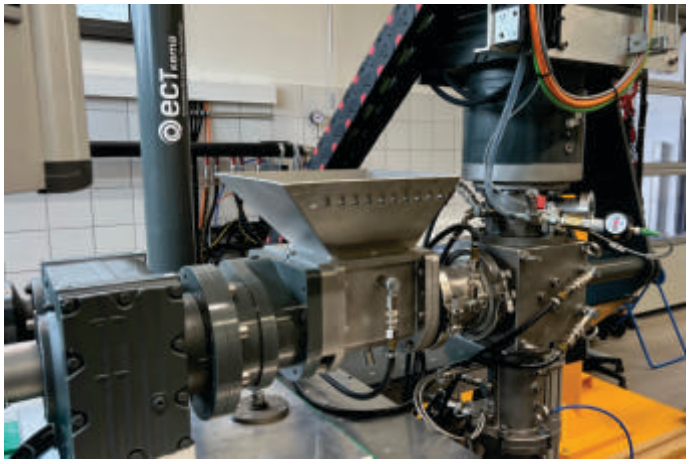
The CERENERGY® batteries provide excellent performance in terms of energy and power density. The energy capacity is around 110-130 Wh/kg and comparable to LFP lithium-ion batteries (90–110 Wh/kg). CERENERGY® batteries charge over 4-6 hours and discharge over similar times which is ideal for the grid storage market. Contrary to electric vehicle applications, batteries for stationary storage do not suffer from mass or volume constraints. However, due to the large amounts of energy and power implied, the cost per power or energy unit is crucial. The joint venture believes that the CERENERGY® battery is ideally suited for the grid storage or long-duration energy sector where very high power in a short period (like high power EVs) is not required. The battery can be configured to meet greater than 600 V that is required in grid storage.

Energy and power curve showing how CERENERGY® batteries are ideally suited to grid storage

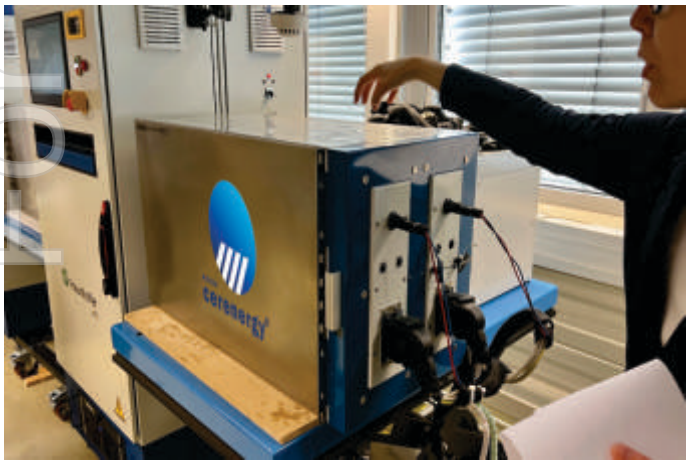


Ceramic solid state electrolyte

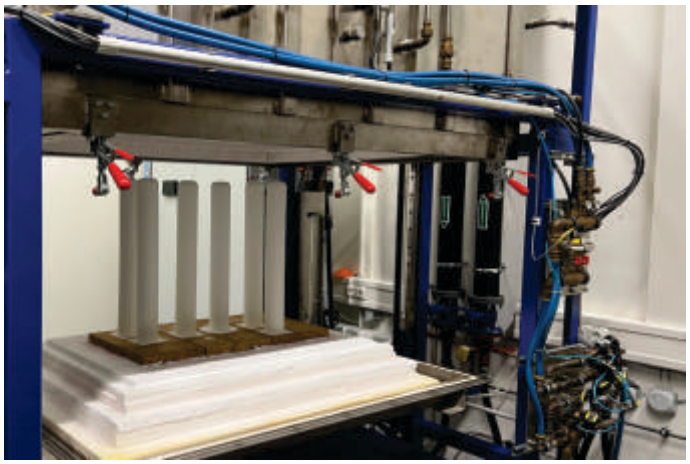
Pilot plant equipment at Fraunhofer



CERENERGY® battery module at outside touch temperature



Pilot plant ceramic tube kiln



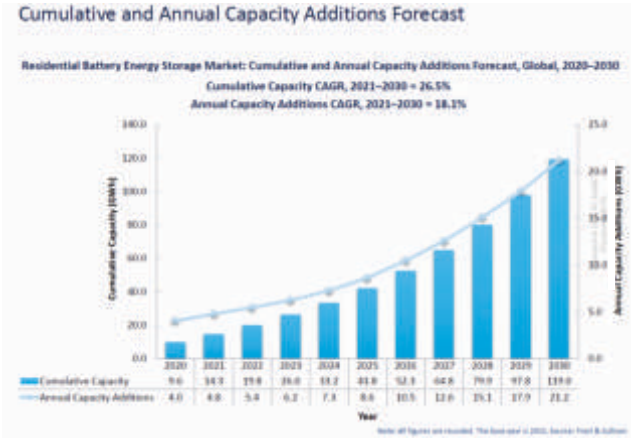
Grid Storage Market

Grid energy storage (also called large-scale energy storage) is a collection of methods used for energy storage on a large scale within an electrical power grid. Electrical energy is stored during times when electricity is plentiful and inexpensive (especially from intermittent power sources such as renewable electricity from wind power, tidal power, and solar power) or when demand is low, and later returned to the grid when demand is high, and electricity prices tend to be higher. Developments in battery storage have enabled commercially viable projects to store energy during peak production and release it during peak demand, and for use when production unexpectedly falls giving time for slower responding resources to be brought online.

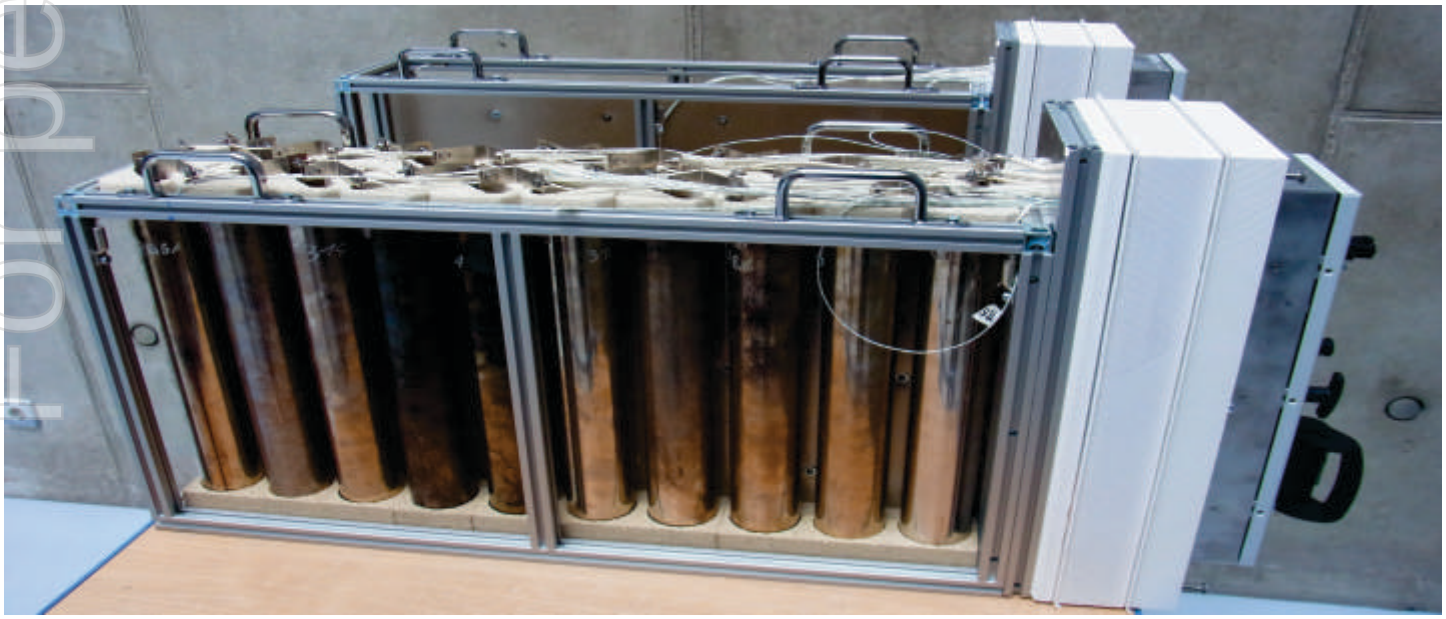
Altech's CERENERGY® batteries are targeted to supply this grid energy storage market which is expected to grow by a 28% compound annual growth rate in the coming decades. The global grid energy storage market is expected to grow from USD 4.4 billion in 2022 to USD 15.1 billion by 2027. Or further out, growth is expected from 20 GW in 2020 to over 3,000 GW by 2050.

There are several deployments of battery energy storage systems for large-scale grid applications. One example is the Hornsdale Power Reserve, a 100 MW/129 MWh lithium-ion battery installation, the largest lithium-ion grid storage in the world, which has been in operation in South Australia since December 2017.

Residential Battery Energy Storage Market

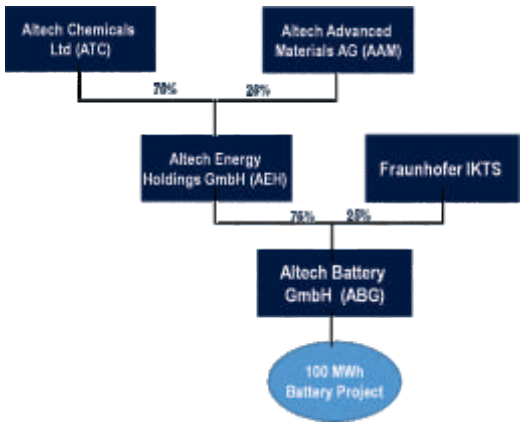


The Hornsdale Power Reserve provides two distinct services; energy arbitrage; and contingency spinning reserve. The facility can bid 30 MW and 119 MWh of its capacity directly into the market for energy arbitrage, while the rest is withheld for maintaining grid frequency during unexpected outages until other, slower generators can be brought online (AEMO 2018). In 2017, after a large coal plant tripped offline unexpectedly, the Hornsdale Power reserve was able to inject several megawatts of power into the grid within milliseconds, arresting the fall in grid frequency until a gas generator could respond. By arresting the fall in frequency, the facility was able to prevent a likely cascading blackout.



Details of Joint Venture Agreement

- Altech Energy Holdings GmbH (AEH) and Fraunhofer entered into a JV Shareholders' Agreement to commercialize a 100 MWh sodium alumina solid state (CERENERGY®) battery project in Saxony, Germany.
- The JV Company, Altech Batteries GmbH (ABG) has been founded and will be registered in Dresden, Germany.
- The ownership of the JV Company (ABG) is 75% owned by AEH and 25% by Fraunhofer.
- Altech Energy Holdings GmbH ("AEH") is a holding company owned by Altech Chemicals Limited (ATC) (75 %) and Altech Advanced Materials AG (25%) and will be registered in Dresden, Germany. See structure diagram below.
- Upon incorporation of ABG, ABG will execute Licence and Intellectual Property Transfer Agreements ("License") with Fraunhofer where ABG will be granted the exclusive worldwide use of the intellectual property (IP) and know-how associated with CERENERGY® Batteries.
- As part of the agreement, Fraunhofer will provide access to the pilot plant, trials and technical expertise associated with the CERENERGY® technology.
- ABG will also have the exclusive right to use the CERENERGY® trademark.
- ABG will execute a Research & Development Agreement (Service Agreement) with Fraunhofer for a period of 4 years, to progress a DFS, funding, construction, commissioning and start-up of a commercial 100 MWh CERENERGY® Battery plant.



- In exchange for the exclusive license, Fraunhofer will be awarded a 25% "free carried" interest of the 100 MWh project (Train 1) with no royalties payable.
- The Altech Group will provide land for the 100 MWh battery project at Schwarze Pumpe, Saxony at market conditions and on an arms' length basis.
- Upon final payment of the Service Development Agreement, Fraunhofer shall transfer the rights to all CERENERGY® IP to ABG.
- From then on, ABG will be the owner of all CERENERGY® Battery technology, IP and trademark.
- At any time, ABG may proceed to expansion of the project to Train 2 or a Gigawatt battery facility subject to appropriate feasibility studies and funding.
- Should ABG decide to proceed to Train 2 or a Gigawatt battery facility, Fraunhofer has the right, but not the obligation, to maintain its 25% interest in the expanded project.
- Fraunhofer has the option to convert its 25% interest in the expanded project to a 1.5% royalty of all future battery module sales.

Fraunhofer IKTS Background

The Fraunhofer-Gesellschaft based in Germany is the world's leading applied research organisation. Prioritizing key future-relevant technologies and commercializing its findings in business and industry, it plays a major role in the innovation process. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research units with over 30,000 employees throughout Germany.

Fraunhofer Institute for Ceramic Technologies and Systems IKTS is one of the 76 institutes which 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. The annual budget of IKTS is € 83 million and it has 800 employees. As a research and technology service provider, Fraunhofer IKTS develops advanced high-performance ceramic materials, industrial manufacturing processes as well as prototype components and systems in complete production lines up to the pilot-plant scale.

Silumina Anodes™ Project Update

The Company announced late last year its game-changing technology of incorporating high-capacity high-purity alumina coated silicon and graphite in lithium-ion batteries, and recently completed a Preliminary Feasibility Study for the construction of a 10,000tpa Silumina Anodes™ plant in Saxony, Germany, that includes a NPV of US$507M.The Company is in the race to get its patented technology to market. To support the development, Altech has commenced construction of a pilot plant adjacent to the proposed project site to enable the qualification process for its Silumina Anodes™ product.

The pilot plant will produce 120kg per day of the Silumina Anodes™ product, which will then be provided to selected potential end users for product testing.

The pilot plant implementation is well underway and progressing to the expected timeframe. Procurement of pilot plant equipment is well advanced, with all long lead equipment already ordered. The pilot plant will be housed in an existing building in Dock3 at Schwarze Pumpe, and required building modifications and panel installation commenced in July 2022 in preparation for pilot plant construction to commence in October 2022. Detailed design is drawing to a close, with the Kuttner Engineering team focusing on the development of commissioning and operational documentation. The Company is pleased with the progress to date and preparing for pre-commissioning of the wet circuit when key equipment arrives.

In anticipation of the pilot plant commissioning, Altech have commenced the Silumina Anodes™ 10,000 tpa Definitive Feasibility Study (DFS) ahead of schedule. The DFS will run in parallel with the pilot plant construction, with the Kuttner Engineering detailed design team transferring to the DFS study. The mass and energy balance from the PFS is currently being validated, with minor changes to the process design simplifying the process in certain areas. Once the final process design is finalised, process flow diagrams (PFDs) and piping and instrument diagrams (PIDs) will be established. Equipment specifications will be finalised and contact with specialized suppliers for firm and final quotes will begin. The Kuttner Engineering DFS team is in place and performing well.

Other Site Update – Visit by German Chancellor

German Federal Chancellor HE Olaf Scholz visited the Schwarze Pumpe site in Saxony, Germany, heading a special delegation to boost economic development in this region. Schwarze Pumpe is the site of Altech's Silumina Anodes™ battery materials project. The delegation included three State Prime Ministers, being Mr Michael Kretschmer of Saxony, Mr Dietmar Woidke of Brandenburg, Mr Reiner Haseloff of Saxony-Anhalt, as well as the special State Minister for Eastern States Industrial / Economic Development Mr Carsten Schneider. Altech's Silumina Anodes™ project was briefly introduced to the Chancellor by Altech's German Managing Director Mr Uwe Ahrens.

German Federal Chancellor HE Olaf Scholz (centre) at Altech's Silumina Anodes™ site in Schwarze Pumpe

German Federal Chancellor HE Olaf Scholz wished Altech's German Managing Director Mr Uwe Ahrens well with the project

During the delegation meeting, Chancellor Olaf Scholz met with the State Ministers of Saxony, Saxony-Anhalt and Brandenburg. The visit to the Dock3 incubator centre in the Schwarze Pumpe Industrial Park, where Altech's Silumina Anodes™ project is situated, was in relation to an interim assessment of structural strengthening within the east German coal regions, and to develop the Government's continuing support for these regions. Following his meeting with the State Ministers, Chancellor Scholz drew a positive interim assessment of structural strengthening within these regions over the next two years. Chancellor Scholz was impressed by the results achieved so far and by the projects being developed within the regions. The exchange with the Chancellor, State Ministers and the East Representative of the Federal Government, Mr Carsten Schneider, was significant for Altech. The Company's Silumina Anodes™ project relates to higher battery efficiency for the German electric vehicle industry. For Chancellor Scholz, reliable and safe energy production in Germany is of the utmost importance for the future. Energy security remains a significant concern within Germany and represents a key focus of the Government.

The Federal Government, and German politics as a whole, is responsible for the promised investments of EUR40 billion to these regions and industries. This represents the largest federal investments in Germany, said Mr Schneider, East Representative of the Federal Government.

Altech is currently progressing with applications for various federal and state grants under the battery development program, as well as other infrastructure and regional financial support programs, in relation to the Silumina Anodes™ project, within the framework of the European Battery Alliance, Structural Development Funds and other special programs initiated by the Federal State of Germany.

Altech's Silumina Anodes™ game changing technology is considered as a key project for industrial development for the State of Saxony, as well as Germany at large. The growing interest in Altech's Silumina Anodes™ product by the European battery and car industry has led to higher political interest, and more importantly, political and economic support.

Altech has been invited to present its technology and Silumina Anodes™ project to the Federal Government of Germany through its Special Task Force of the Chancellery, led by Mr. Carsten Schneider, Minister of State and Federal Government Commissioner for East Germany.

Altech's German Managing Director Mr Uwe Ahrens stated *"With the blessing of the German Chancellor, as well as with the State Minister, Altech looks forward to significant support for the Silumina Anodes™ project in Schwarze Pumpe. It is pleasing to be able to present Altech's projects to the Chancellery in Berlin, and I am very much looking forward to it and am optimistic for the outcome."*

Federal Chancellor HE Olaf Scholz of Germany (centre), State Prime Ministers Mr Dietmar Woidke of Brandenburg (far left), Mr Reiner Haseloff of Saxony-Anhalt (second from left), Mr Michael Kretschmer of Saxony (second from right) and Special State Minister Mr Carsten Schneider (far right)

Strategic Partnership with Fraunhofer IKTS for Silumina Anodes™ Qualification

Altech has announced that it had executed a framework agreement with leading German institute Fraunhofer IKTS as a strategic partner to expedite the testing and qualification process for the Company's Silumina Anodes™ product. Fraunhofer boasts labs, technical centres with outstanding equipment at its sites in Dresden (Saxony), Hermsdorf (Thuringia) and several other sites in Germany. Fraunhofer is considered as one of, if not the leading know-how and research centre for battery materials in the world. Fraunhofer recently opened their Battery Innovation and Technology Center (BITC) in Arnstadt.

The main objective of the strategic partnership is for Fraunhofer to independently test the long-term performance of Altech's Silumina Anodes™ battery material in various battery applications. Fraunhofer, through its extensive lithium-ion battery research and network of partners, will be able provide extensive performance testing of various types of battery applications that will assist the qualification process of the Silumina Anodes™ product for potential customers.

Altech is well funded to complete a pilot plant adjacent to its industrial site in Saxony, Germany, in order to supply commercial samples to potential downstream customers and for the qualification process.

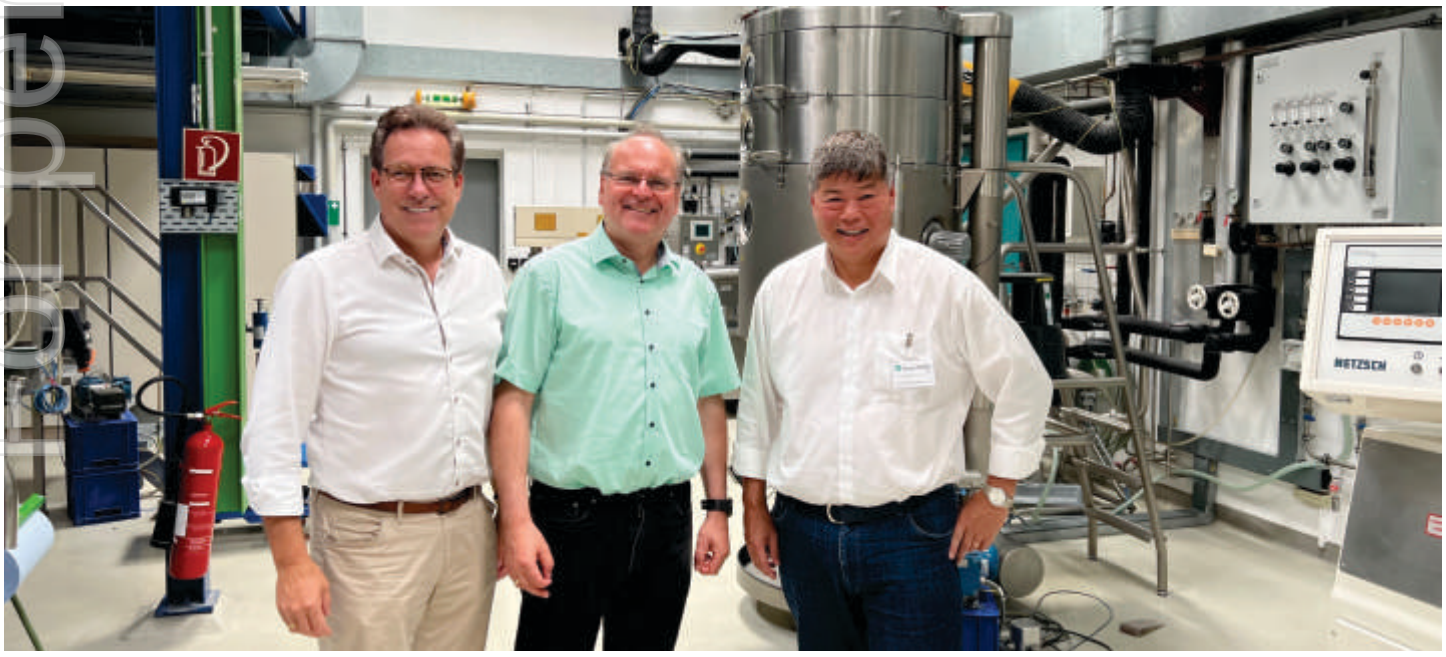
Altech recently completed a pre-feasibility study for a 10,000 tpa Silumina Anodes™ plant in Germany. The Company's silicon graphite composite product not only achieves a much higher energy capacity than the conventional graphite anode, it is also stable during the life of the battery. The Company announced in late 2021 that it had achieved a 30% higher energy battery with improved cyclability or battery life, and is now in the process of commercial development.

With a capital investment of only US$95 million, the pre-feasibility study for the project returns a net present value of US$507 million, with yearly net free cash generated of US$63 million. The internal rate of return of the project is estimated at a very attractive 40%. Altech is quickly advancing the project to the next stage of development.

The Company is well positioned to dramatically reduce supply risks by positioning its operation in Germany and sourcing its graphite and silicon feedstock from European suppliers.

During the recent crisis in Europe forcing supply chain pressures and rising energy prices, it has demonstrated the importance of European material supply for European battery and EV makers. The manufacturing supply risks are becoming increasingly evident, and more focus will be placed on European supply.

Uwe Ahrens (Altech), Prof Alexander Michaelis (IKTS), Iggy Tan (Altech) at IKTS test facilities in Dresden



Expansion of Research Laboratories for Pouch Cell Batteries

Altech has expanded its Research and Development Laboratories in Perth, Western Australia to allow the production of pouch cell size batteries to proceed to the next stage of the Silumina Anodes™ Project.

Altech announced in November last year that it had achieved the game-changing breakthrough and produced a lithium-ion battery with 30% more energy capacity than a conventional graphite only lithium-ion battery. The Company was able to successfully incorporate alumina-coated silicon into the graphite anode of lithium-ion batteries and achieve higher energy capacity, as well as increased cyclability. The battery performance testing was conducted with the industry standard coin cell rechargeable lithium-ion batteries.

Coin battery cells provide a very useful comparison, but they have limitations, because of their design and construction. When developing new active material for lithium-ion batteries, the cell chemistry is first optimised in smaller format coin cells and then progressively scaled up to full-sized pouch cells to provide more information on electrochemical performance, energy density, and safety. To assess anode material against EV application targets, a scale-up from coin cell to pouch cell is necessary.

The pouch cell, a common design of a lithium-ion battery, is in a vacuum-packed thin plate shape in which are arranged many layers of thin cathode and anode electrodes. 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.

By having an in-house pouch cell production and testing facility, electrical abuse scenarios, whereby the cell is required to operate outside nominal voltage and current limitations, can be tested. Physical and environmental abuse scenarios, whereby the cell is subjected to temperature extremes or mechanical deformation, can also be tested. The energy content of a coin cell is usually too low to induce a response to typical abuse tests.

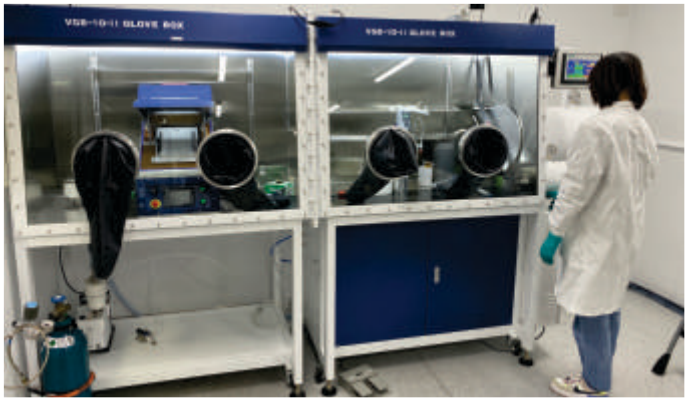
Expansion of R&D Lab

Manufacturing a pouch cell with multiple layers requires more anode material and additional cell-making equipment. During the first quarter of 2022, Altech installed and commissioned a larger-scale tube furnace in its R&D Laboratories in Perth. The furnace has the capability of calcining 1kg samples per batch.

Proposed Testwork

Altech plans to assemble lithium-ion pouch cells for high-power applications. Electrochemical tests will apply on both coin cells and pouch cells with the same electrode to know whether the performance measured in coin cells is representative of full-sized cells. It is also important to understand the different contributions of mechanical and thermal factors to the degradation process in each cell format. Once optimized in electrochemical properties, Altech will also undertake a safety test on pouch cells using its Silumina Anodes™ material in-house, or collaborate with external laboratories.

New double glove box for pouch cell making



Update of High Purity Alumina Project

Altech provides an update on its Malaysian high purity alumina (HPA) project, and its continuing efforts to close project finance.

Managing director Iggy Tan, accompanied by executive management, completed a visit to Europe during the year. The visit included a meeting with German government owned KfW IPEX-Bank, during which the bank was briefed on the status of Altech's secondary project finance initiatives – a US$144m green bond offer and the US$100m project level equity funding initiative. KfW IPEX-Bank confirmed its continued support for the project, and its commitment to the senior loan facility of US$190m. Importantly, Euler Hermes, the German government export credit agency, has renewed the US$170m export credit cover (guaranteed) for the KfW IPEX Bank senior loan facility. Both KfW IPEX-Bank and Euler Hermes acknowledged the headwinds facing project finance close from disruptions caused by the pandemic in the last few years as well as the current market uncertainty exacerbated by the Ukraine crisis in Europe.

A meeting was also held with Altech's long-standing strategic engineering partner and metallurgical consultant SMS group GmbH ("SMS"). SMS is contracted to construct the Malaysian HPA plant, and like KfW IPEX-Bank and Euler Hermes, SMS reiterated that it continues to be supportive of the Company's HPA project and looks forward to re-starting work on site. Altech and SMS agreed to extend the long stop date on the HPA plant's EPC contract.

Altech continues to work with London based structuring agent Bedford Row Capital Plc and Perth based Bluemount Capital (WA) Pty Ltd to finalise a US$144m green bond offering. Detailed presentations and discussions with interested parties are ongoing, and these are expected to continue.

In parallel with the bond offering, Altech is continuing with its endeavours to secure commitments for a project equity investment of US$100M. US Based global investment bank DelMorgan & Co. has advanced several leads and potential investors in relation to this. Presentations by Altech and detailed discussions with interested parties are ongoing.

Whilst headwinds in the current equity and financial markets are challenging, management remains committed to the project finance process, and for a positive project finance outcome.

In Malaysia, the HPA plant site within the Tanjung Langsat Industrial Complex remains in sound condition. Regular site maintenance work is undertaken and permanent site security is in place. The already constructed maintenance workshop, electrical substation and storm water management infrastructure remain in as-constructed condition.

Altech Chemicals Limited

QUARTERLY REPORT

June 2022

Company Snapshot

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

FINANCIAL INFORMATION
(as at 30 September 2022)

Share Price:	$0.09
Shares:	1,427m
Options:	-
Performance Rights:*	30.1m
Market Cap:	$128m
Cash:	$8.5m

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

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*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 September 2022:

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 CHEMICALS LTD

ABN	Quarter ended ("current quarter")
45 125 301 206	30 September 2022

Consolidated statement of cash flows		Current quarter $A'000	Year to date (3 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	(545)	(545)
	(e) admin, corporate and R&D costs	(811)	(811)
1.3	Dividends received (see note 3)	-	-
1.4	Interest received	25	25
1.5	Interest and other costs of finance paid	-	-
1.6	Income taxes paid	-	-
1.7	Government grants and tax incentives	-	-
1.8	Other (provide details if material)	-	-
1.9	**Net cash from / (used in) operating activities**	**(1,331)**	**(1,331)**

2.	**Cash flows from investing activities**		
2.1	Payments to acquire or for:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	(1,062)	(1,062)
	(d) exploration & evaluation	(5)	(5)
	(e) investment in Altech Advanced Materials AG	-	-
	(f) other non-current assets		-

Consolidated statement of cash flows		Current quarter $A'000	Year to date (3 months) $A'000
2.2	Proceeds from the disposal of:		
	(a) entities	-	-
	(b) tenements	-	-
	(c) property, plant and equipment	-	-
	(d) investments	-	-
	(e) other non-current assets	-	-
2.3	Cash flows from loans to other entities	-	-
2.4	Dividends received (see note 3)	-	-
2.5	Other (provide details if material)	-	-
2.6	**Net cash from / (used in) investing activities**	**(1,067)**	**(1,067)**

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	-	-
3.6	Repayment of borrowings	-	-
3.7	Transaction costs related to loans and borrowings	-	-
3.8	Dividends paid	-	-
3.9	Other (Lease repayments)	(14)	(14)
3.10	**Net cash from / (used in) financing activities**	**(14)**	**(14)**

4.	**Net increase / (decrease) in cash and cash equivalents for the period**		
4.1	Cash and cash equivalents at beginning of period	10,913	10,913
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(1,331)	(1,331)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(1,067)	(1,067)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	(14)	(14)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (3 months) $A'000
4.5	Effect of movement in exchange rates on cash held	(1)	(1)
4.6	**Cash and cash equivalents at end of period**	**8,500**	**8,500**

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	8,470	10,883
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)**	**8,500**	**10,913**

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	(207)
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)	(1,331)
8.2	(Payments for exploration & evaluation classified as investing activities) (item 2.1(d))	(5)
8.3	Total relevant outgoings (item 8.1 + item 8.2)	(1,336)
8.4	Cash and cash equivalents at quarter end (item 4.6)	8,500
8.5	Unused finance facilities available at quarter end (item 7.5)	-
8.6	Total available funding (item 8.4 + item 8.5)	8,500
8.7	**Estimated quarters of funding available (item 8.6 divided by item 8.3)**	6.36

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:

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:

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: 31 October 2022

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.