



21 June 2016

## **FORECAST SURGE IN HPA DEMAND DRIVEN BY LITHIUM-ION BATTERIES**

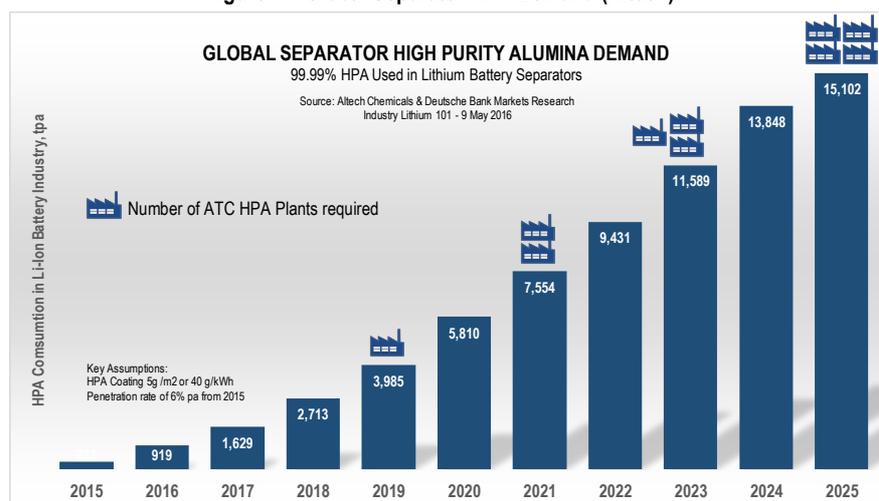
### **Highlights**

- HPA demand for lithium-ion battery manufacture forecast to increase at 30% per year to 2025
- Demand forecast to increase from ~1,000tpa in 2016 to ~15,000tpa in 2025
- Equivalent to four (4) of Altech’s proposed HPA plants required to satisfy 2025 demand
- Electric vehicle manufacturers requiring lithium-ion batteries with HPA coated separators

Following its 3 June 2016 announcement regarding the strong interest shown in Altech Chemicals Limited (Altech/the Company) (ASX: ATC) as an emerging high purity alumina (HPA) producer during the 12<sup>th</sup> China International Battery Fair, the Company is pleased to present its 10-year forecast of global demand for HPA used in the lithium-ion battery manufacturing sector.

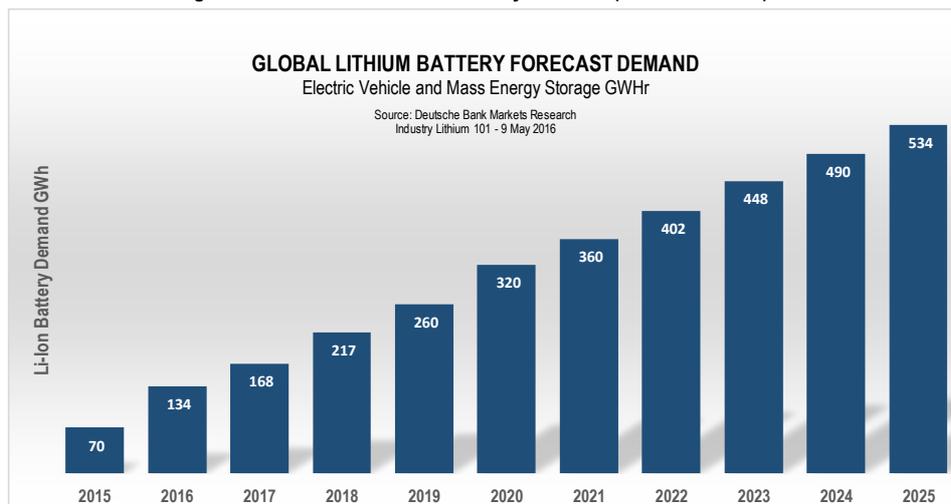
The Company has estimated that demand for HPA from lithium-ion battery manufacturers will grow significantly over the next decade from forecast usage of ~1,000tpa in 2016 to ~15,000tpa in 2025; this represents annual year-on-year demand growth of approximately 30% per year. In order to meet this demand, additional HPA production capacity equivalent to four (4) of Altech’s proposed 4,000tpa HPA plants in Malaysia would need to be constructed and commissioned during the forecast period, as illustrated in Figure 1 below.

**Figure 1 – Global Separator HPA Demand (Altech)**



The HPA demand forecast has been calculated based on lithium-ion battery manufacturing data recently published by Deutsche Bank. The data predicts annual global demand for lithium-ion batteries will rise from 70 gigawatt-hours (GWh) per year in 2015 to 535GWh per year by 2025 (see Figure 2). The Company has applied reported HPA usage per kilowatt-hour in lithium-ion battery separators (a vital battery component) to calculate forecast global HPA demand for the lithium-ion battery manufacturing sector.

Figure 2 – Global Lithium-ion Battery Demand (Deutsche Bank)

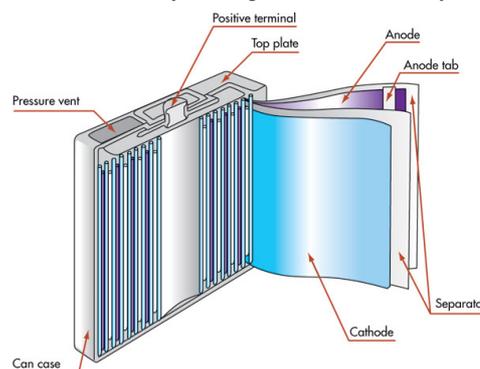


### HPA and lithium-ion batteries

The major application of HPA in lithium-ion batteries is as a coating on the ceramic separator sheet that divides the cathode and anode electrodes within the battery. HPA-coated separators withstand unusually high temperature incursions, increase battery separator shrinkage temperatures and reduce flammability during thermal runaways, and thus make lithium-ion batteries much safer.

HPA-coated battery separators also increase a battery's discharge rate; lower self-discharge; and lengthen battery life cycles. Electric vehicle manufacturers are increasingly demanding lithium-ion batteries with 99.99% (4N) HPA-coated separators.

American automotive company Tesla recently announced the 2018 launch of its lithium-ion battery manufacturing facility called "Gigafactory" in the USA. The name Gigafactory comes from the factory's planned annual battery pack output capacity of 50GWh. In co-operation with Panasonic and other strategic partners, the Gigafactory will reportedly produce batteries for significantly less cost using economies of scale, innovative manufacturing, reduction of waste, and the simple optimisation of locating most manufacturing processes under one roof. Tesla expects to drive down the per kilowatt hour (kWh) cost of the battery pack by more than 30%. By 2020, the Gigafactory will reportedly reach full capacity and produce more lithium-ion batteries annually than were produced worldwide in 2013.



Altech estimates that at its full production rate the Tesla Gigafactory will require around 2,020tpa of HPA for separator coatings, which is equivalent to half the output of the Company's proposed Malaysian HPA plant.

Altech managing director Mr Iggy Tan said, "HPA demand growth in the LED sector has long been acknowledged and understood; this growth is however now complemented by HPA demand growth in the lithium-ion battery industry, specifically from battery separator sheet manufacturers.

"The timing for construction of Altech's proposed HPA plant in Malaysia appears perfect, with two parallel streams of near-term HPA demand growth now apparent. The important point is that we are entering a market showing high demand growth, Altech's proposed production capacity should be easily absorbed without the need to fight for market share", Mr Tan concluded.

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For more information, please contact:

**Corporate**

Iggy Tan  
Managing Director  
Altech Chemicals Limited  
Tel: +61 8 6168 1555  
Email: [info@altechchemicals.com](mailto:info@altechchemicals.com)

Shane Volk  
Company Secretary  
Altech Chemicals Limited  
Tel: +61 8 6168 1555  
Email: [info@altechchemicals.com](mailto:info@altechchemicals.com)

**About Altech Chemicals (ASX: ATC)**

**Altech Chemicals Limited** (Altech/the Company) is aiming to become one of the **world's leading suppliers of 99.99% (4N) high purity alumina (HPA) (Al<sub>2</sub>O<sub>3</sub>)**.

HPA is a high-value, high margin and highly demanded product as it is the critical ingredient required for the production of artificial sapphire. Artificial sapphire is used in the manufacture of substrates for LED lights, semiconductor wafers used in the electronics industry, and scratch-resistant artificial sapphire glass used for wristwatch faces, optical windows and smartphone components. There is no substitute for HPA in the manufacture of artificial sapphire.

Global HPA demand is approximately 19,040tpa (2014) and demand is growing at an annual rate of 28%, primarily driven by the growth in worldwide adoption of LEDs. As an energy efficient, longer lasting and lower operating cost form of lighting, LED lighting is replacing the traditional incandescent bulbs. HPA demand is expected to at least double over the coming decade.

Current HPA producers use an expensive and highly processed feedstock material such as aluminium metal to produce HPA. Altech has completed a Bankable Feasibility Study (BFS) for the construction and operation of a 4,000tpa HPA plant at Tanjung Langsat, Malaysia. The plant will produce HPA directly from kaolin clay, which will be sourced from the Company's 100%-owned kaolin deposit at Meckering, Western Australia. Altech's production process will employ conventional "off-the-shelf" plant and equipment to extract HPA using a hydrochloric (HCl) acid-based process. Production costs are anticipated to be considerably lower than established HPA producers.

The Company is currently in the process of securing project financing with German KfW IPEX-Bank.



**Forward-looking Statements**

This announcement contains forward-looking statements which are identified by words such as 'anticipates', 'forecasts', 'may', 'will', 'could', 'believes', 'estimates', 'targets', 'expects', 'plan' or 'intends' and other similar words that involve risks and uncertainties. Indications of, and guidelines or outlook on, future earnings, distributions or financial position or performance and targets, estimates and assumptions in respect of production, prices, operating costs, results, capital expenditures, reserves and resources are also forward looking statements. These statements are based on an assessment of present economic and operating conditions, and on a number of assumptions and estimates regarding future events and actions that, while considered reasonable as at the date of this announcement and are expected to take place, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies. Such forward-looking statements are not guarantees of future performance and involve known and unknown risks, uncertainties, assumptions and other important factors, many of which are beyond the control of our Company, the Directors and management. We cannot and do not give any assurance that the results, performance or achievements expressed or implied by the forward-looking statements contained in this announcement will actually occur and readers are cautioned not to place undue reliance on these forward-looking statements. These forward looking statements are subject to various risk factors that could cause actual events or results to differ materially from the events or results estimated, expressed or anticipated in these statements.