



23 November 2016

ROBUST OUTLOOK FOR GLOBAL HPA DEMAND CONFIRMED

Highlights

- Global HPA demand increased by 19.5% in 2015
- Annual HPA demand forecast of 86,831tpa by 2024 (est. 2016: 25,315tpa)
- Altech’s strategy of focusing on 4N HPA endorsed
- HPA use in lithium-ion batteries offers incremental demand
- Current reported HPA price in Japan is ~US\$30,000/t
- Threat of substitutes for HPA remains low

Altech Chemicals Limited (Altech/the Company) (ASX: ATC) is pleased to provide an update on the outlook for global high purity alumina (HPA) demand from a report entitled “High Purity Alumina Market – Global Industry Analysis and Forecast, 2016 – 2024” by Persistence Market Research (“Persistence”), commissioned as part of the current project debt funding due diligence program.

Demand likely to increase on backdrop of Growing Applications

Persistence has reported global consumption of HPA in 2015 of 21,309 tons, compared to 17,832 in 2014, an increase in annual demand of 19.5% for the period.

Importantly, demand growth for HPA is expected to remain strong, with the global market for HPA forecast to increase from the current estimate of 25,315 tons (2016) to 86,831 tons by 2024, a 343% increase in market size at an annual growth rate of 16.7%.

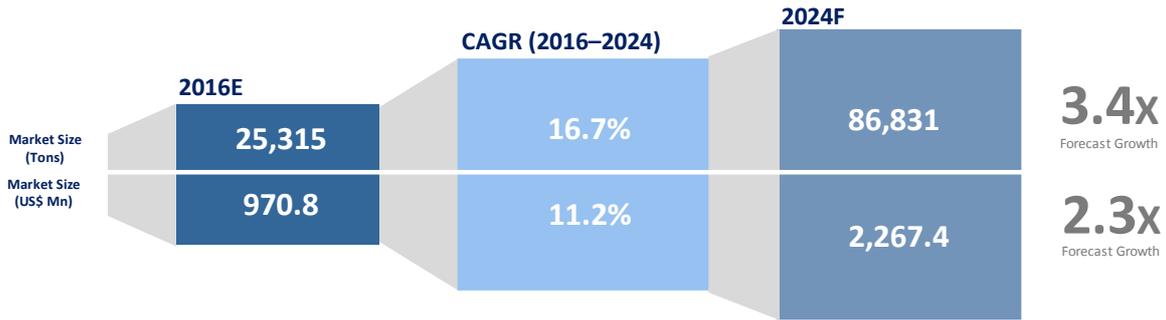
Figure 1: Global High Purity Alumina Market Volume (Tons) and Value (US\$ Mn), 2014–2024



Source: PMR, 2016

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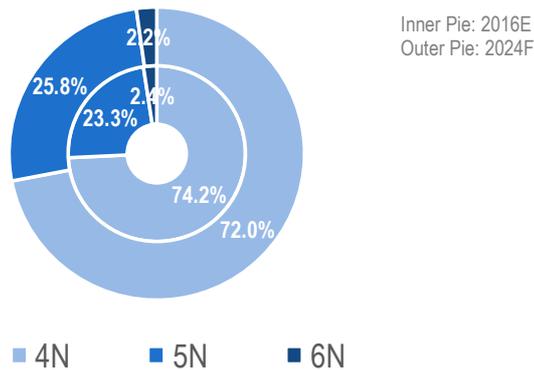
Figure 2: Global High Purity Alumina Market Snapshot



4N HPA demand to dominate

Persistence confirmed that demand for 4N HPA (99.99% Al₂O₃), the market segment that Altech is targeting with the proposed construction of its Malaysian HPA plant, is forecast to continue to dominate the HPA market and account for 72% of overall HPA demand in 2024 (2016: 74.2%). Persistence is in agreement with Altech’s strategy to focus exclusively on the 4N HPA market, due to the size and growth of that market segment.

Figure 3: Global High Purity Alumina Market Volume Share, by Product Type



Specific HPA market comments by Persistence in its report included:

“...the company has planned a HPA production facility of 4,000 tons of 4N HPA, Assuming that Altech’s HPA product offerings adhere to the purity levels which the company claims to achieve consistently, the planned production capacity of 4,000 tons is fairly reasonable and would help the company to establish itself as one of the leading players in the global HPA market.”

“...based on the analysis of current demand and projections till 2024, (Persistence) agrees that the HPA buyer market can absorb 4,000 tons of HPA on a yearly basis. With this production capacity, the company can position itself among the industry leaders . . . “

“Furthermore, industry participants opined that the majority of buyers would prefer sourcing HPA from single large suppliers rather than relying on several small suppliers...Consequently, a gradual transition among large scale buyers towards large scale suppliers has been reported. This shift is likely to amplify over the coming years, as buyers increase emphasis on the quality of the final product.”

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LED sector to outshine all others

Persistence reported that the sustained increase in demand for LEDs is being driven by the global phase out of florescent and incandescent lighting and the transition to LEDs; this will underpin 4N HPA demand growth during the period 2016-24.

In terms of volume, the LED segment is estimated to account for 57.3% of global HPA consumption in 2016, growing to 61% by 2024.



“Regulatory constraints on the use of incandescent bulbs is expected to enter in its final phase in China (wherein imports and sales of 15W and above incandescent lights towards the end of current year - October, 2016 (are phased out)). Similarly, Japan intends to phase out incandescent and fluorescent bulbs by 2020. The Indian government aims to replace 770 million incandescent bulbs with LEDs by 2019 creating substantial demand for LEDs, which is likely to translate into the opportunity for raw material suppliers including HPA producers.” (Persistence)

Lithium-ion battery sector – blue-sky growth

Lithium-ion battery production is expected to witness robust growth during the forecast period, driven primarily by increasing demand for renewable energy storage, electric and hybrid vehicles and consumer electronics requiring more compact and longer lasting rechargeable energy storage.

A significant portion of large format lithium-ion battery separator manufacturers utilise HPA as a separator coating material. HPA-coated separators withstand higher temperatures thus reducing the propensity for battery thermal runaway, increasing battery safety. The expected robust growth in lithium-ion battery production, coupled with the growing adoption of HPA-coated battery separators, provides an opportunity for rapid HPA demand growth in this application during the forecast period. Countries such as Japan and South Korea account for the majority of global demand for HPA used in lithium-ion battery separator production.

Persistence supports Altech’s strategy to target the synthetic sapphire and the lithium-ion battery industries.

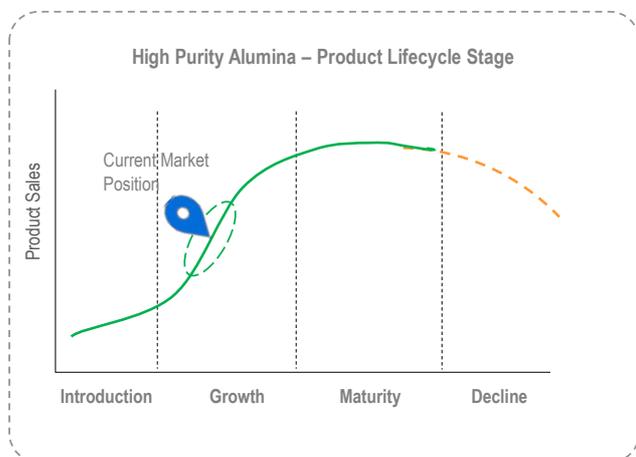
“Altech’s intent of focusing on catering to demand for HPA from LED, lithium-ion battery and sapphire glass applications is reasonable. Also, we agree with Altech’s strategy of not targeting application areas such as phosphor, on the backdrop of relatively slower growth and relatively lower share in overall global HPA consumption.” (Persistence)

Product Lifecycle – it’s still early days for HPA

Although HPA has been commercially produced for over three decades, production volume growth has been significantly low.

However, demand for HPA has increased rapidly over the last few years, primarily due to the proliferation of LEDs for lighting and other electronics applications. The global HPA industry is currently considered to be positioned about the mid-point of the “growth” phase of its lifecycle, with substantially more growth to come.

Figure 4: HPA Product Lifecycle



The above illustration is indicative in nature
Source: PMR Analysis

HPA Pricing

In its report, Persistence noted an exponential growth in the price of HPA, which is subject to grade and quality. However Persistence believes that 4N HPA pricing is expected to consolidate over the forecast period on the assumption that the majority of new HPA producers will adopt the lower cost acid-leach process to be employed by Altech. By 2024 4N HPA prices are seen as settling in a range of US\$33,000 – US\$17,000 per tonne (depending on quality), compared to the current range of US\$44,000 – US\$23,000 per tonne. “Albeit, prices are anticipated to stabilize at around US\$28 per kg, particularly for 4N HPA used in sapphire applications”. Altech has adopted a conservative long-term average price of US\$23,000 per tonne for its 4N HPA. The current reported price of 4N HPA in Japan is round US\$30,000 per tonne.

“...it can be concluded that the assumed price of US\$23 per kg in Altech’s financial model seems to be reasonable, considering that the company will continue to consistently produce HPA with quality as well as specifications mentioned in shared documents. Persistence considers that the assumed price is conservative and once the company achieves said production of 4,000 tons per annum as well as specified quality, the company can aim an estimated market share of 10% in 2019.” (Persistence)

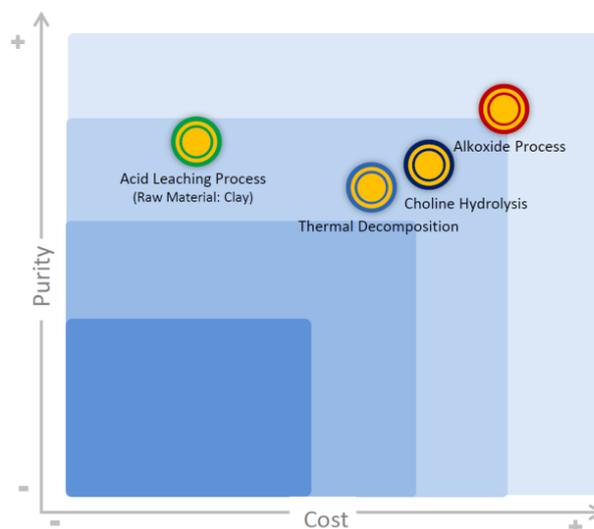
Alternative (Higher Cost) Routes for HPA Production

Persistence also identified that HPA is conventionally produced using processes such as the aluminum alkoxide process, modified-Bayer process, and choline hydrolysis process, among others. The aluminum alkoxide process for HPA production uses a relatively higher priced (around US\$2,500–US\$3,500 per ton) feedstock, namely high purity aluminum (in order to obtain high purity aluminum, bauxite is processed to obtain smelter grade alumina, which undergoes processing and purification, yielding high purity aluminum). In the alkoxide process, pure aluminum is treated with alcohol to obtain aluminum alkoxide. This aluminum alkoxide is further hydrolysed to obtain hydrated alumina. Hydrated alumina, thus obtained, is further calcined and processed to obtain HPA. As such, aluminum alkoxide-based processing for HPA production is both cost and energy intensive.

The Persistence report confirmed Altech’s positioning as a low-cost producer of HPA via the adoption of acid-leach processing of alumina-rich kaolin clay for HPA production. A combination of lower raw material and overall operating costs with the higher level of overall efficiency of the process delivers to Altech a cost of production well below the competing HPA processing techniques.

“...if the process manages to yield comparable grades of HPA, it is likely to significantly drive down the cost of production, thereby emerging as one of the least cost-intensive processes for production of this high priced product.” (Persistence)

Figure 5: HPA Production Process Comparison (cost and purity) and process comparison



“...the company is likely to gain a competitive edge over competitors that use conventional and a relatively cost-intensive process for HPA production”. (Persistence)

APAC region to dominate global HPA consumption

Persistence recognised the strategic advantage of Altech being in the Asia Pacific region, sighting better customer engagement, which is expected to help the Company establish a footprint in the ever-growing HPA market within the region.

“Moreover, another noteworthy fact is that two of the leading three HPA producers that offer higher priced and better quality products for concerned applications, do not have their production facilities in Asia Pacific region. This is thus likely to help Altech develop an edge over the competition”. (Persistence)

Mitsubishi tie-up likely to create value for Altech

Persistence also sees the Mitsubishi 10 year off-take agreement with Altech as a strategic advantage.

“Mitsubishi Australia Ltd., as an exclusive off-taker of HPA produced by Altech Chemicals Ltd., is well positioned to commercialize the product in the market. The level and particulars of the engagement between both parties establishes a firm relation and reduces risk exposure. The off-taker is backed by Mitsubishi Corporation, which also increases its financial credibility. The engagement is projected to translate into a good initial market footprint for Altech Chemicals Ltd.” (Persistence)

“Altech’s tie-up with Mitsubishi will also minimize Altech’s expenditure on product marketing, which is an added advantage to the producer.” (Persistence)

Feedstock security to shield the project from potential risk

Persistence noted that Altech has developed a single-step process that uses a relatively lower cost feedstock, namely kaolin (or aluminous clay), to produce HPA by acid leaching; avoiding the use of high-cost feedstocks such as high purity aluminum. Persistence also noted that Altech has positioned itself as a mining and chemicals company i.e. it is vertically integrated in terms of raw material production and final HPA production. Persistence concludes that this vertical integration is likely to result in consistency and security in raw material supply. Also, no use of aluminum for HPA production process renders the company insulated to aluminum price fluctuations.

Threat of Substitutes is Low

Persistence reported that the impact of ‘Threat of substitutes’ for the HPA market is relatively low. No suitable alternative is available for use in applications requiring HPA. Its analysis also reported that the bargaining power of HPA suppliers is expected to remain high, with relatively few HPA producers globally. The bargaining power of HPA buyers on the other hand was assessed by Persistence as moderate-to-low, primarily due to the large number of businesses consuming HPA versus the relatively low number of HPA producers.

Use of HPA is imperative, especially for the production of sapphire ingots. Also, use of HPA for lithium-ion battery separator coatings as against conventionally used coating materials has been found to impart superior performance characteristics to the end product.



Comments

Commenting on the key findings of the Persistence report, Altech managing director Iggy Tan said “This latest HPA market analysis report confirms the robust outlook for global HPA demand and the HPA pricing assumption used in the financial model for the Company’s proposed Malaysian HPA project. Importantly, the report confirms the low-cost/high purity of the acid-leach processing that Altech has adopted for its Malaysian HPA plant and confirms the continued strong bargaining power of HPA producers and the low level threat of substitute products for HPA.”

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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)** (Al₂O₃).

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 25,315tpa (2016) and demand is growing at an annual rate of 16.7% (2016-2024), 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.

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 the aim of commencing project development in Q2-2017.



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.