

Altech Chemicals Limited

ASX: ATC FSE:A3Y

Internationale Delmetall-Rohstoffmesse
Munich, Germany

Iggy Tan
Managing Director



Altech Chemicals
Limited

World leading producer of high purity alumina (HPA)



4,500 tonnes pa

Our Vision



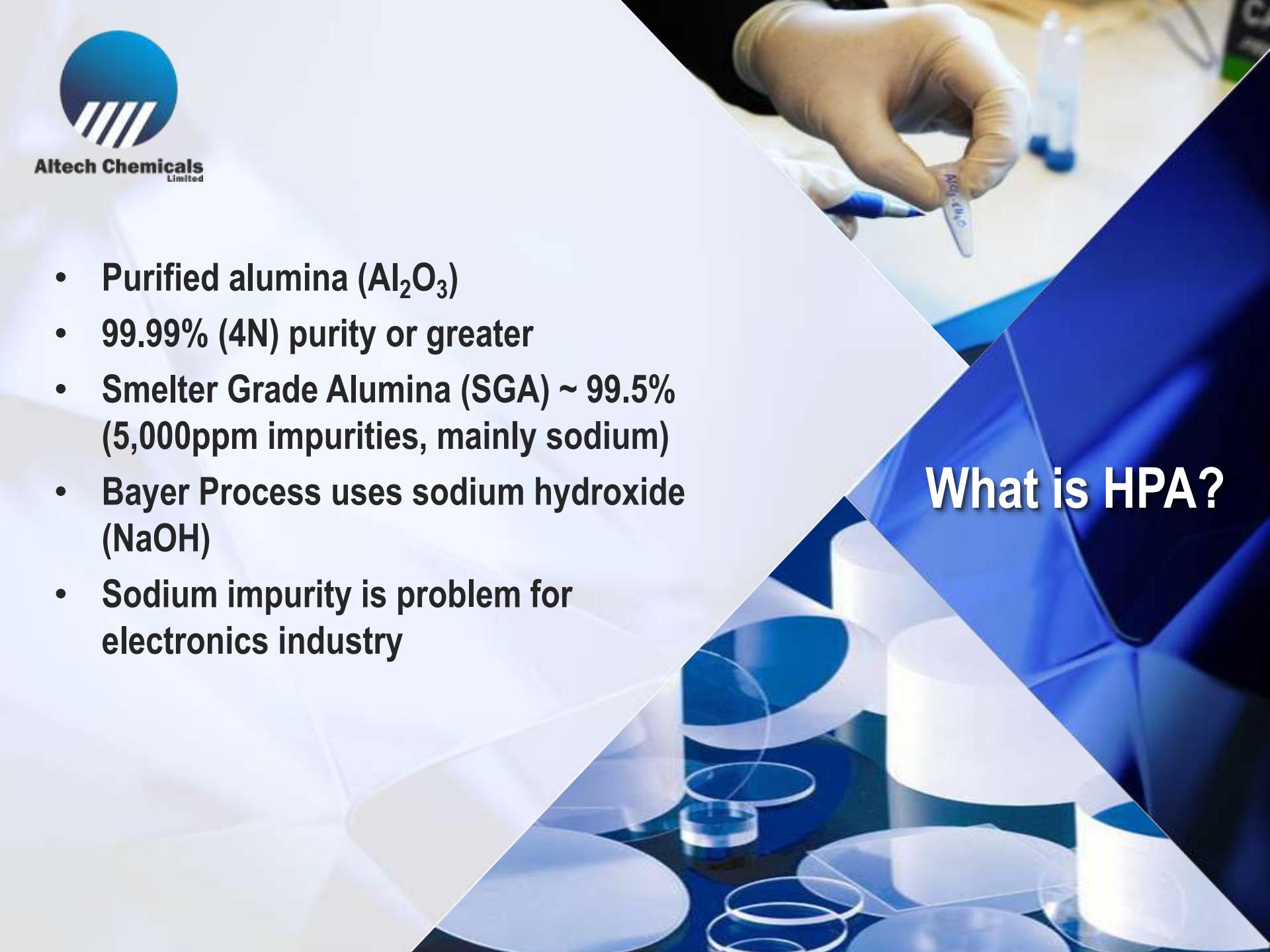
- **Sapphire & Ruby**
- **Natural form of high purity alumina (HPA) Al_2O_3**
- **Formed by mother nature like diamonds**
- **Colour from impurities**
- **Nearly as hard as diamond (Mohs 9)**

**Sapphire
Gemstone**



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- Purified alumina (Al_2O_3)
- 99.99% (4N) purity or greater
- Smelter Grade Alumina (SGA) ~ 99.5%
(5,000ppm impurities, mainly sodium)
- Bayer Process uses sodium hydroxide
(NaOH)
- Sodium impurity is problem for
electronics industry



What is HPA?



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Smelter Grade
Alumina
SGA 99.5%
US\$400 per t



High Purity
Alumina
HPA 99.9% (3N)
US\$6,000 per t



High Purity
Alumina
HPA 99.99% (4N)
US\$27,000 per t



High Purity
Alumina
HPA 99.999% (5N)
US\$50,000 per t

Our Target Business

High price
for purity

HPA substrate for LEDs

4N HPA produces synthetic sapphire glass



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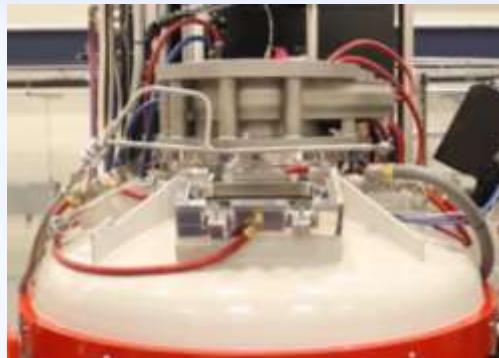
High Purity Alumina



High Purity
Alumina



Battery Separators / Cathode / Anode



Sapphire Furnace (2,000 °C)



Sapphire Crystal Boule

Synthetic
Sapphire



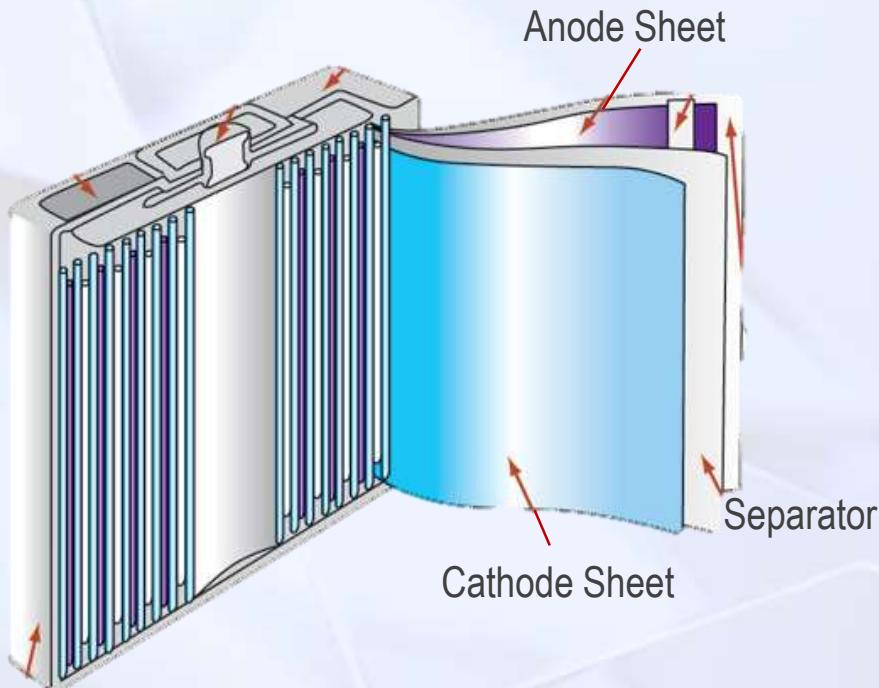
Lithium-Ion
Batteries

Lithium-Ion
Batteries



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Lithium-ion Battery Separator



HPA is used in lithium-ion battery
separator coatings



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Sapphire Applications



Sapphire Cores



Sapphire Wafer / Substrate



Sapphire Glass



Light Emitting Diodes LED



Smartphone and Lenses

LEDs

Glass

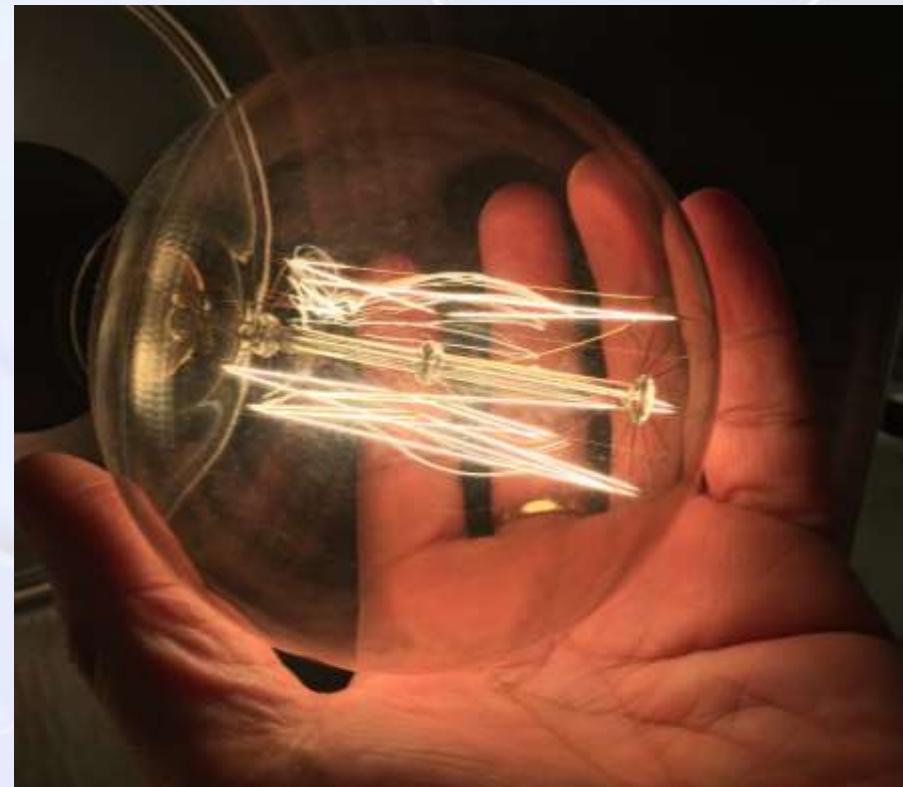


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LEDs – lighting of the future



Conventional LEDs



New LED products



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Sapphire Glass



HTC U Ultra (128Gb)

- February 2017
- Sapphire crystal display



iPhone

- Sapphire crystal lens
- Finger print recognition



Vertu TI luxury smartphone

Smartphone
sapphire screen



Sapphire Glass Scratch Test



Stone wall



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- **Global HPA demand 25,315tpa in 2016¹**
- **Expected to increase to 86,831tpa by 2024¹**
- **Growing at a CAGR of 17%¹**
- **Driven by LED growth & lithium-ion batteries**
- **Entering a fast growing market**
- **Altech production 4,500 tpa**

Demand for HPA

¹ Source: Persistence Market Research "High Purity Alumina Market – Global Industry Analysis and Forecast 2016-2024"

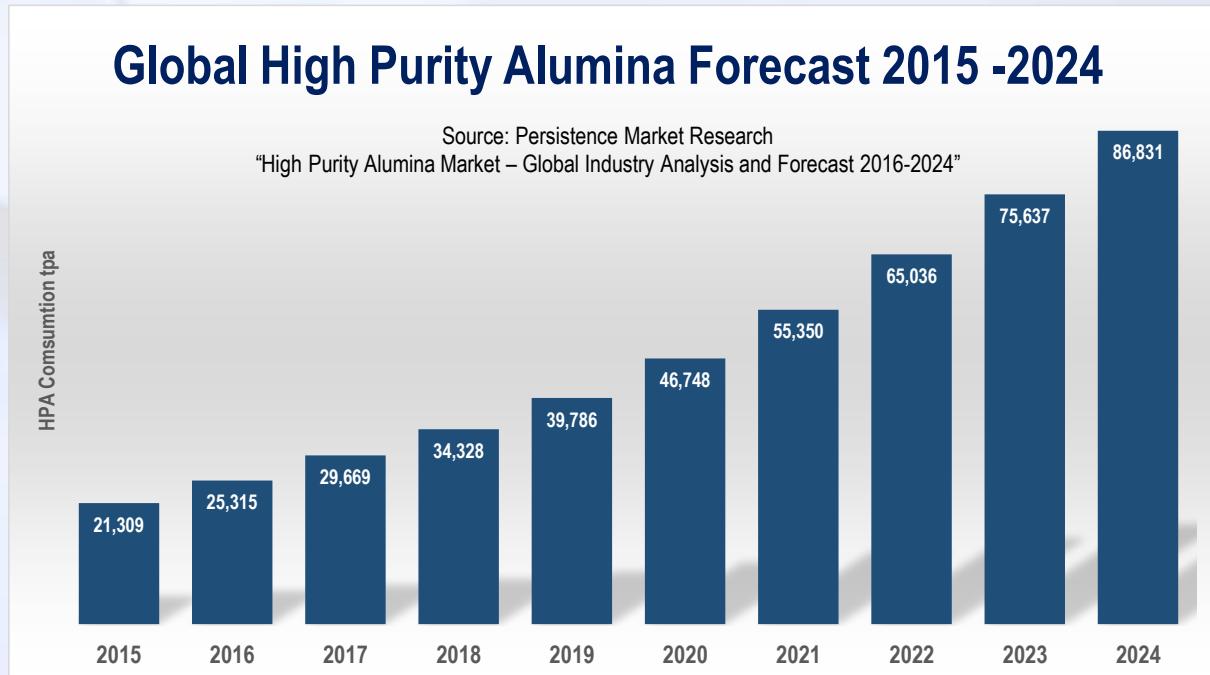


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Global High Purity Alumina Forecast 2015 -2024

Source: Persistence Market Research

"High Purity Alumina Market – Global Industry Analysis and Forecast 2016-2024"



Demand for HPA

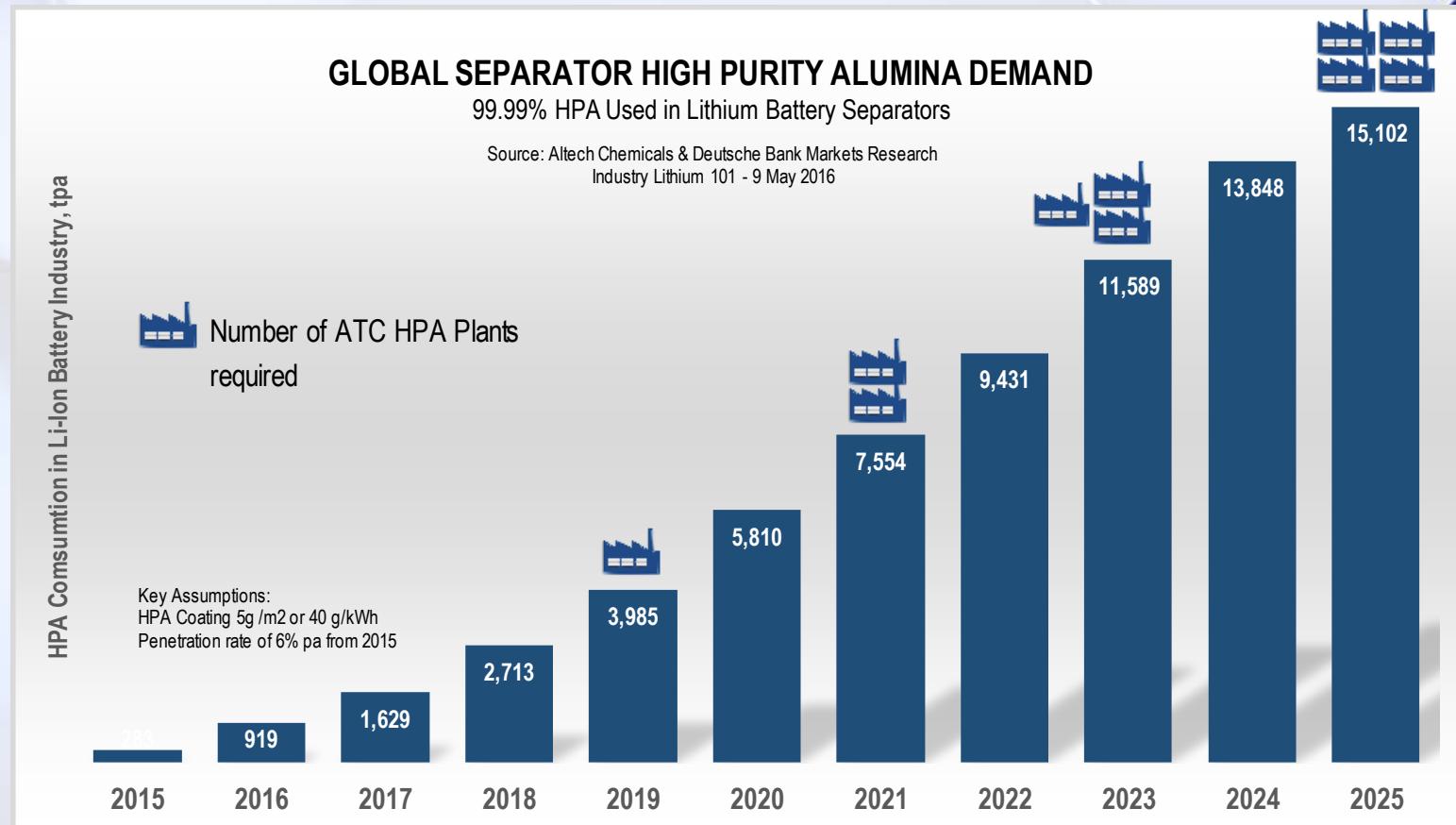
- Global LED light demand forecast to increase to 4.1 billion by 2024 (2015: 864 million)

Source: Navigant Research "LED Lighting: Global Outlook"



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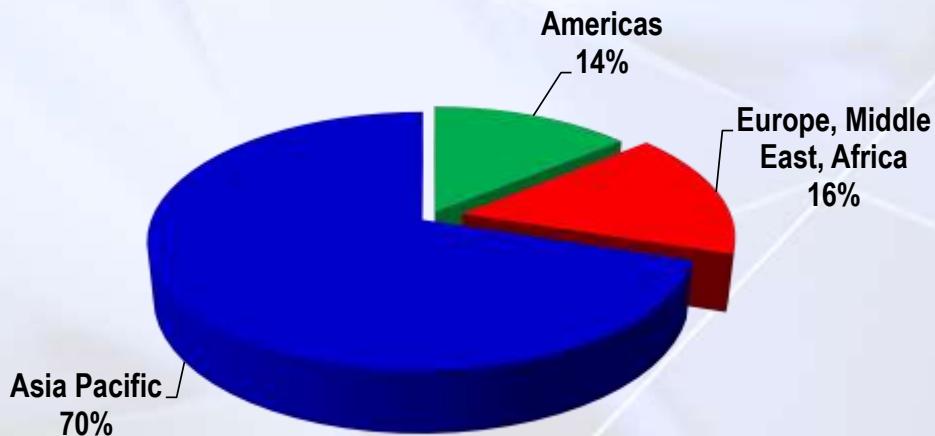
HPA Battery Separator Forecast





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- 70% of HPA demand Asia Pacific (APEC)
- World's manufacturing hub
- Malaysian HPA plant location well-positioned
- Transport, customer service, technical credibility

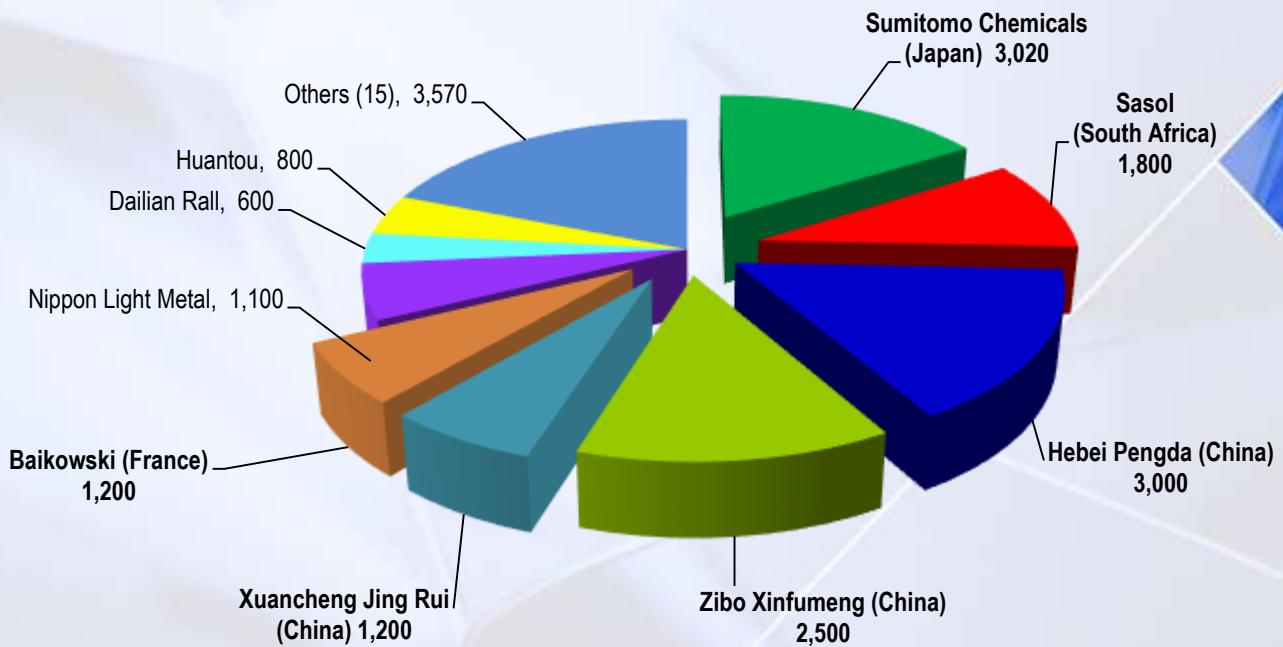


HPA Geographic Demand





- Six largest HPA producers:
China (3), Japan (1), South Africa (1) France (1)



Current HPA Producers



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Altech's Differentiation



Bauxite

Alumina
Refinery



Smelter Grade Alumina
99.5%

Current HPA Producers

Alumina
Smelter



Aluminium Metal
~US\$3,000 per tonne

Aluminium
Dissolution



99.99% (4N)
HPA



Kaolin
(aluminous clay)

ALTECH HPA PLANT

One Single Process Step



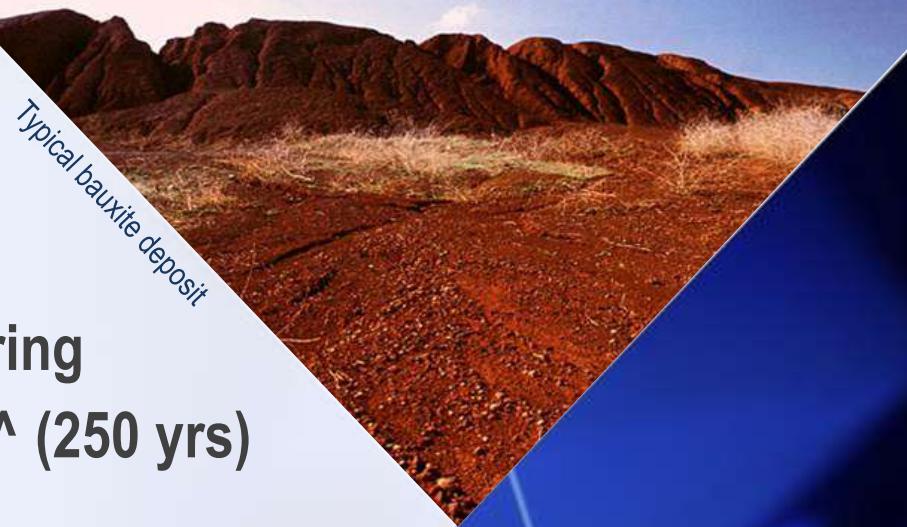
99.99% (4N)
HPA



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- Very low iron (Fe) due to weathering
- 12.7Mt JORC Mineral Resources[^] (250 yrs)
 - Measured Resources 1.5Mt @ 30% Al_2O_3
 - Indicated Resources 3.3Mt @ 30% Al_2O_3
 - Inferred Resources 7.9Mt @ 29.1% Al_2O_3
- Deposit in Western Australia

%	Bauxite Darling Range*	Canadian HPA Project	Altech HPA Project
Al_2O_3	34.5	22.77	30.5
SiO_2	21.5	53.29	56.3
Fe_2O_3	21.2	8.36	0.7
TiO_2	2.00	0.98	0.7
K_2O	0.24	3.41	0.1
NaO	0.005	1.42	0.1



* Typical Mean Analysis

[^] JORC (2012) Mineral Resources (refer ASX Announcement 11 October 2016); the Company is not aware of any new information or data that materially affects the information included in this announcement and confirms that all material assumptions and technical parameters underpinning the estimates continue to apply and have not materially changed.



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- Altech owns 100% of kaolin deposit in WA
- Low environmental impact
- 130kms from Fremantle Port
- Mining lease (M70/1334) granted
- Ore Reserve 1.2Mt @ 30% Al_2O_3 for 30 year (stage 1) mine-life

Meckering Kaolin Deposit





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- Lower quartile costs
- Kaolin feedstock shipped from WA
- Chemical-zoned industrial park (Tanjung Langsat)
- Sea container ports
- Plant site secured
- Malaysian government incentives

HPA Site
Location
Johor





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- Established HCl leach process
- Developed in 1980's by alumina industry
- Couldn't compete with Bayer SGA costs
- But great at producing HPA (no sodium-ions)
- However little demand for HPA in 1980s
- Demand for HPA is here today



Altech HPA
Process



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New HPA Demand + Established Process
+ Unique Deposit + Experienced People
→ Shareholder Value



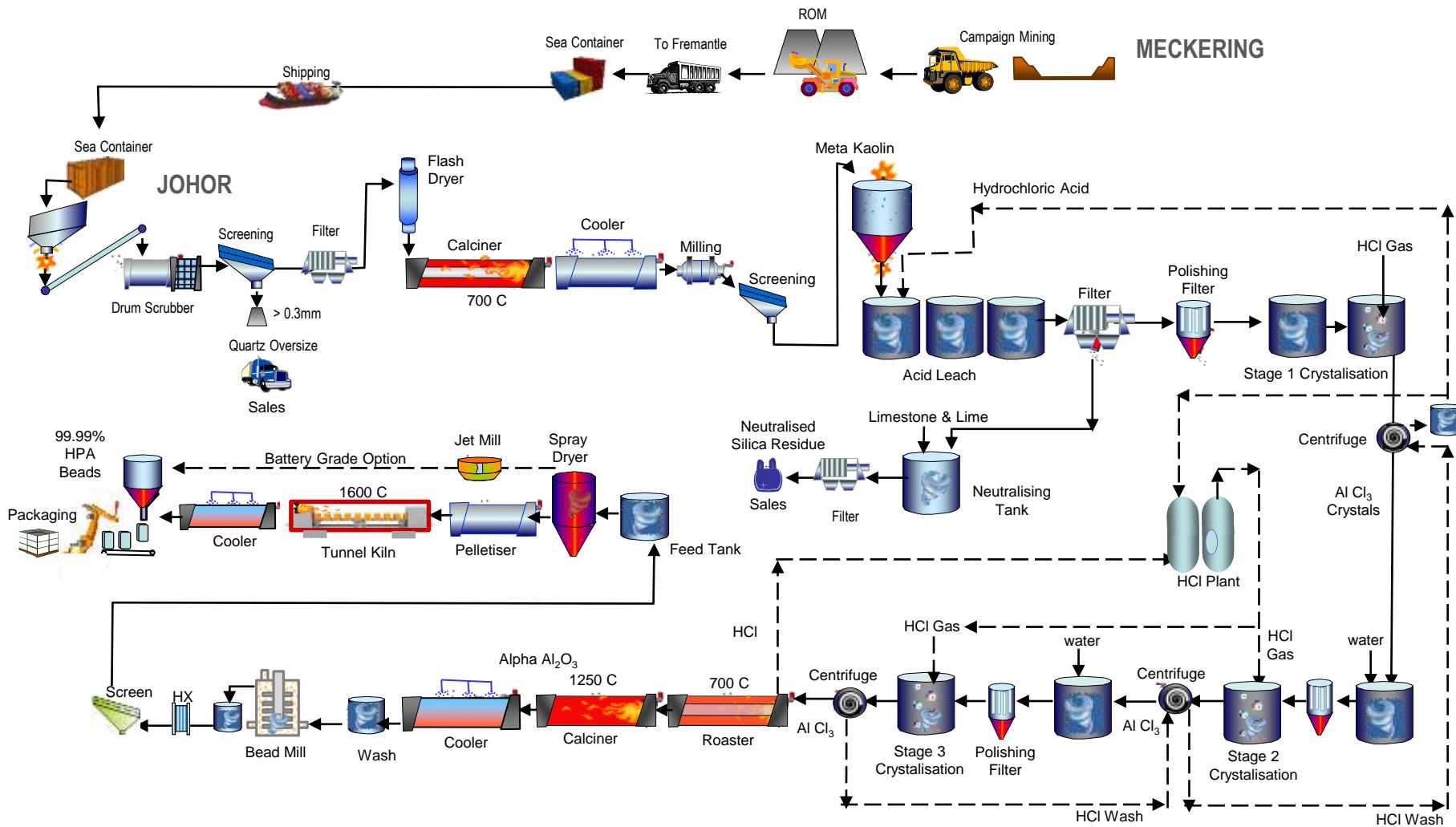
Business
Strategy

*“the last piece of the
puzzle is in place”*



Altech HPA Process

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- Work started early 2011
- Extensive lab and pilot plant test work
- Successfully produced 4N 99.99% HPA
- Off-the-shelf plant and equipment
- Completed successful BFS
- Final Investment Decision approved

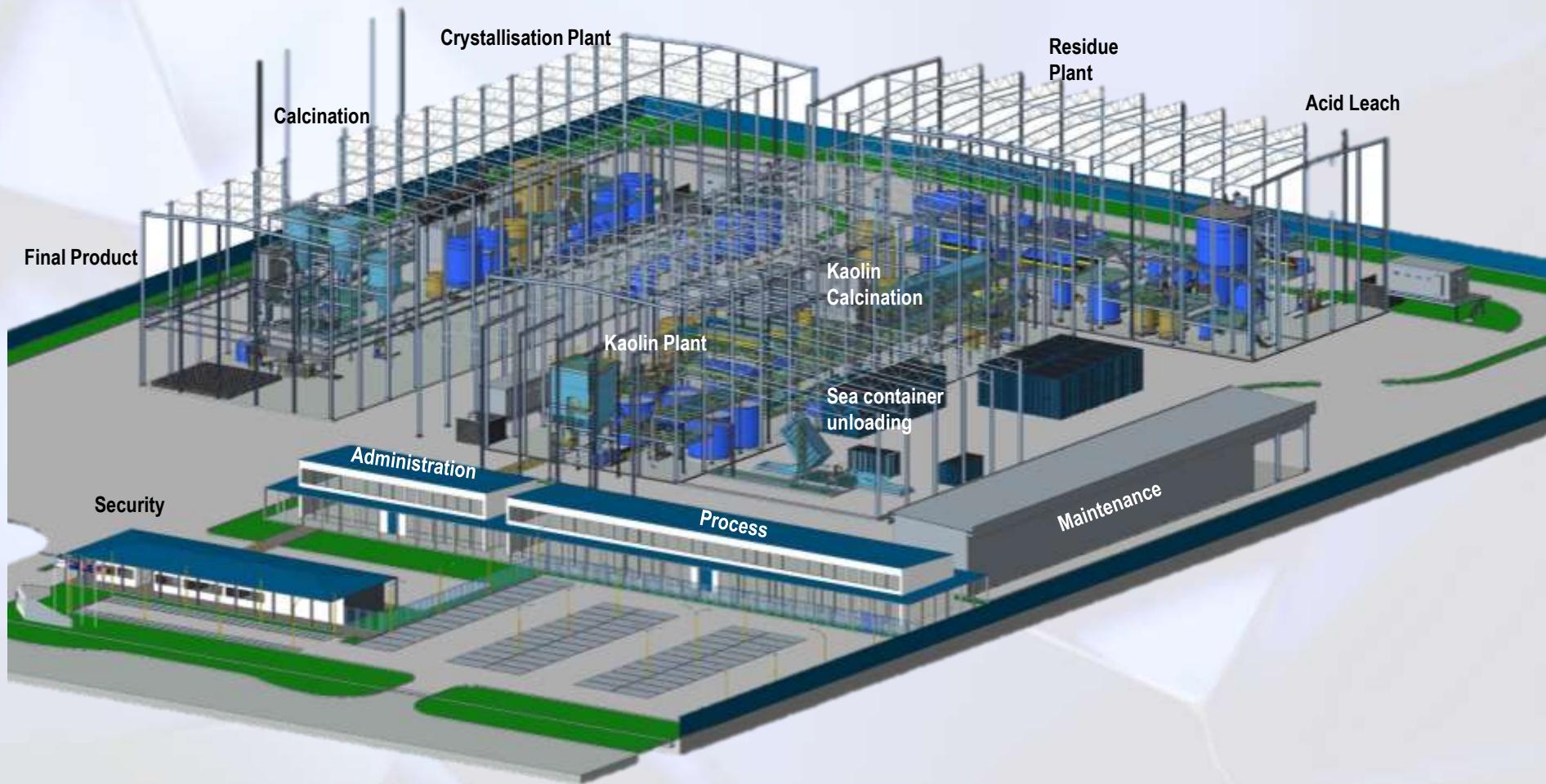


Going
Commercial



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Altech's HPA Plant – Malaysia

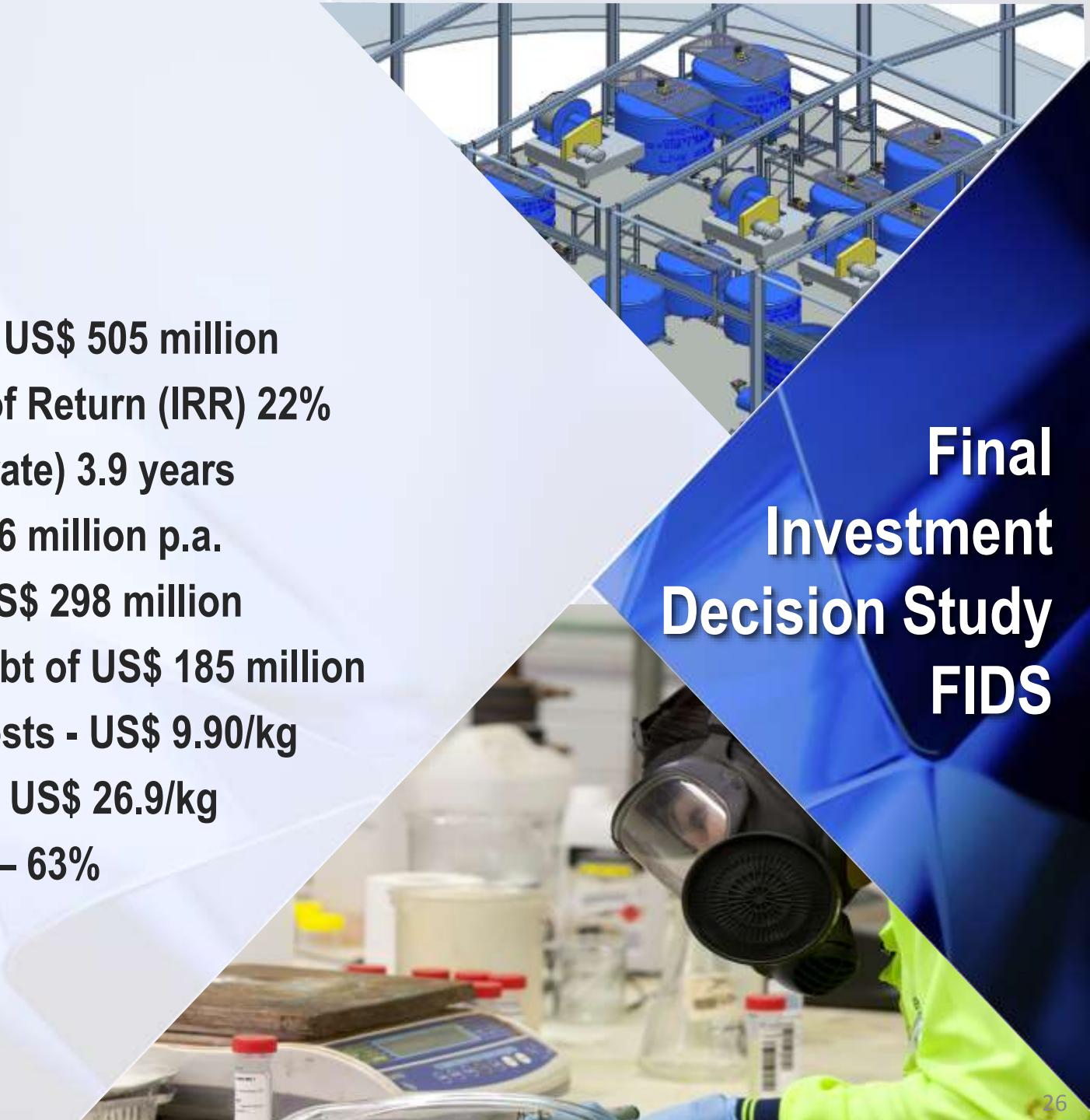




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- Pre-tax NPV_{7.5} US\$ 505 million
- Internal Rate of Return (IRR) 22%
- Payback (full rate) 3.9 years
- EBITDA US\$ 76 million p.a.
- Capital cost US\$ 298 million
- Total target debt of US\$ 185 million
- Production Costs - US\$ 9.90/kg
- LT Sale Price - US\$ 26.9/kg
- Gross Margin – 63%

Final Investment Decision Study FIDS





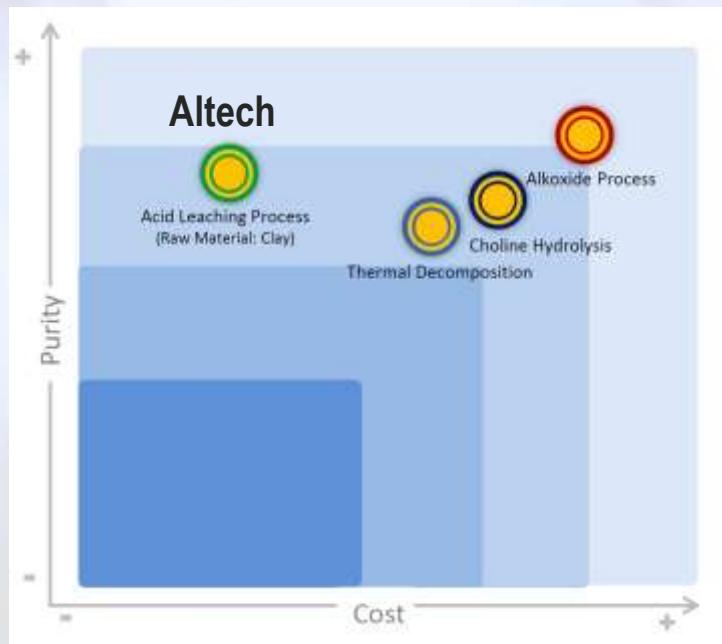
- Current price in Japan - US\$ 40.0/kg
- Pre-tax NPV_{7.5} US\$ 1.1 billion
- Internal Rate of Return (IRR) 33%
- Payback (full rate) 2.2 years
- EBITDA US\$ 133 million p.a.
- Production Costs - US\$ 10.50/kg
- Sale Price - Gross Margin – 74%

High Case Economics



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- Competitors US\$14 - 17,000/t (Breakaway Research)
 1. We own our feedstock
 2. Main reactant HCl re-used
 3. Plant in low cost country (Malaysia)



Bottom
Quartile
for Op Costs



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- Off-take sales agreement with Mitsubishi
- First 10 years of HPA operations
- Secures sales for 100% of 4,000tpa HPA plant production
- Exclusive global distributor
- Experienced with HPA
- Strategic priority: lithium-ion batteries

Mitsubishi
signs
off-take





- Target total debt of US\$ 185 million
- US\$ 165 million export credit finance
- Debt funding with KfW IPEX-Bank
- 50% of plant – German suppliers
- Low interest, long tenure
- ECA approval date 14 Dec 2017

Final Stage of
Debt Funding
Approval



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- SMS group German EPC contractor
- Lump sum turn key contract
- Completion and cost risk
- Process & throughput guarantee
- Equity investment contribution
- Detailed design at advanced stage
- Completing EPC cost estimate



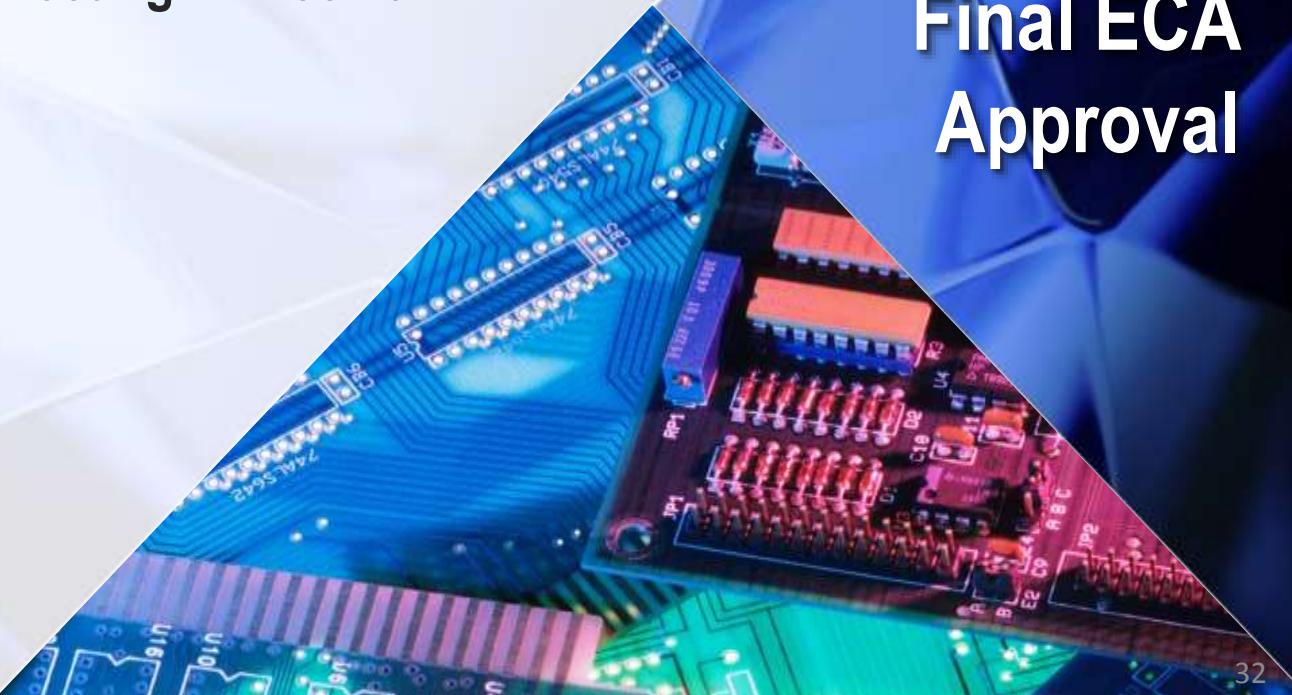
**Lump Sum
Turn Key
Contract**

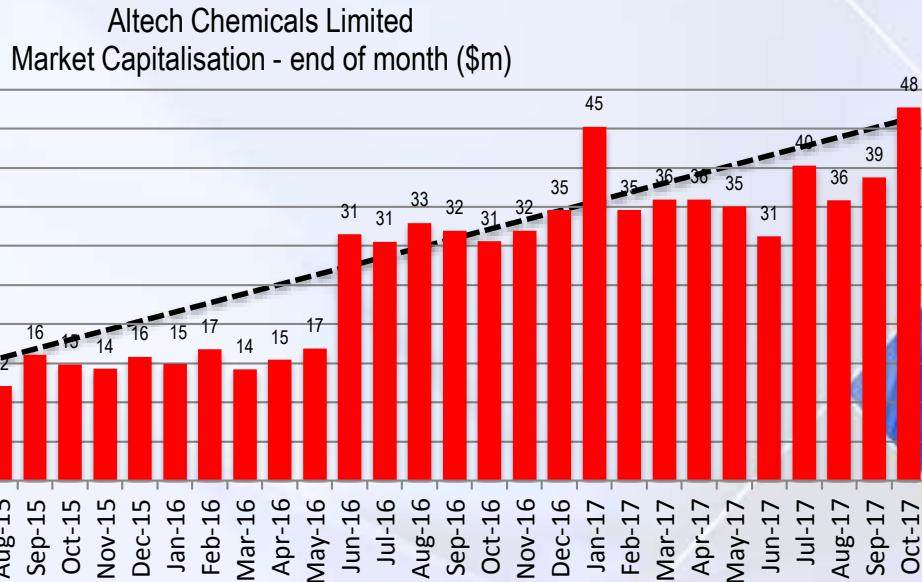




- All consultants report completed
- Expert opinion report 9 Nov 2017
- IMA ECA approval meeting 14 Dec 2017

Target
Final ECA
Approval



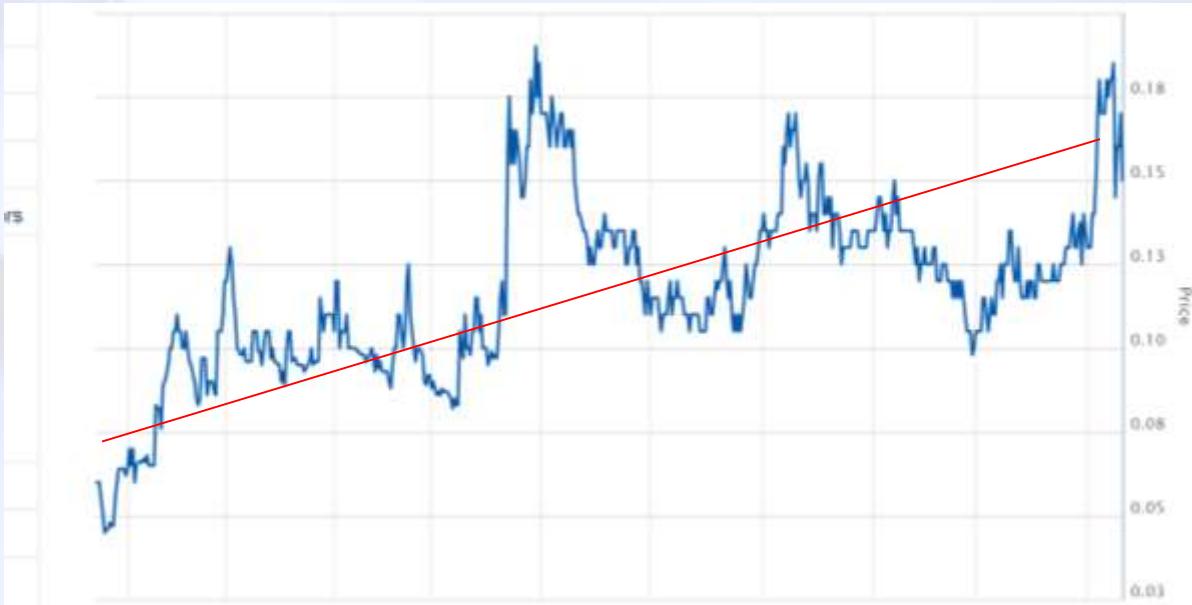


Altech
growth
performance

- Steady market cap growth
- Ave trade value \$2k/day to \$50k/day
- 640 shareholders to 1,850 shareholders



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Altech 3 Year Share Price Trend

- 300% growth in share price in 3 years
- Still early in valuation stage



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*Right Place
Right Time
Right Feedstock
Right Technology*



Thank you



Forward-looking Statements

The Company reports that the ECA application process is set for end 2017 and there is no certainty that the export credit and debt finance will be approved. The Company makes no representation or warranties whatsoever as to the outcome of the ECA approval process

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.

Competent Persons Statements – Meckering Kaolin Deposit

The information in this announcement that relates to Mineral Resources and Ore Reserves is extracted from the report entitled "Maiden Ore Reserve at Altech's Meckering Kaolin Deposit" released on 11 October 2016; the report is available to view on the Company's website www.altechchemicals.com. The Company confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement and, in the case of estimates of Mineral Resources and Ore Reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed. The Company confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.