

Altech Chemicals Limited (ASX:ATC)

**North America Roadshow
Company Presentation**

**Iggy Tan
Managing Director**



Altech Chemicals
Limited



To be a world leading producer of
high purity alumina (HPA)



Our vision





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- **Sapphire - natural form of high purity alumina (HPA)**
- **Formed by mother nature like diamonds**
- **Extremely hard – no. 9 on Mohs scale (third hardest mineral behind diamond)**
- **Scratch-resistant artificial sapphire glass made from HPA**

**Sapphire
gemstone**





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- **Purified alumina or aluminum oxide (Al_2O_3)**
- **Greater than 99.99% (4N) purity**
- **Maximum allowable impurities of 100ppm**
- **Smelter Grade Alumina (SGA) ~ 99.5% (5,000 ppm impurities)**
- **Bayer Process, sodium contamination**
- **Lots of work to upgrade SGA (99.5%) → 4N 99.99% HPA**
- **Heat resistance, electrical insulation, abrasion & corrosion resistance, extreme hardness**



What is HPA?



Smelter Grade
Alumina
SGA 99.5%
\$0.4 per Kg



High Purity
Alumina
HPA 99.9% (3N)
\$1 -10 per Kg



High Purity
Alumina
HPA 99.99% (4N)
\$10-50 per Kg



High Purity
Alumina
HPA 99.999% (5N)
\$50-150 per Kg

Our Target Business

HPA in Sapphire Crystal Glass

HPA substrate for LEDs

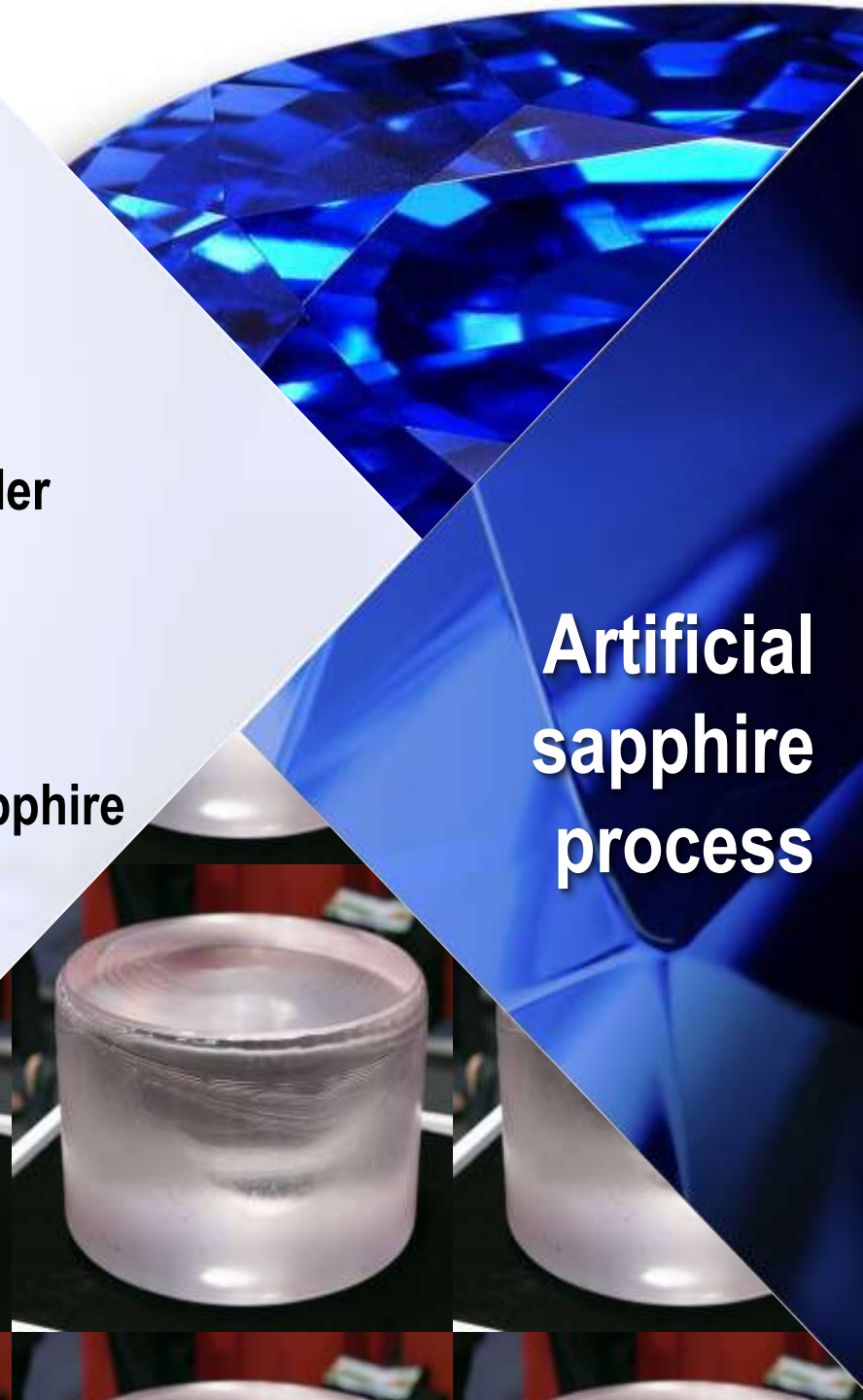
**High price
for purity**



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- HPA is placed in an autoclave
- Heated to $>2,000^{\circ}\text{C}$ melting point under intense pressure
- Forms single crystal sapphire (boule)
- Allowed to cool slowly – 22 day cycle
- Diamond cutting equipment to cut sapphire shapes
- Heat & scratch resistant

**Artificial
sapphire
process**



Welcome to the world of HPA





**High Purity
Alumina
Applications**

LEDs

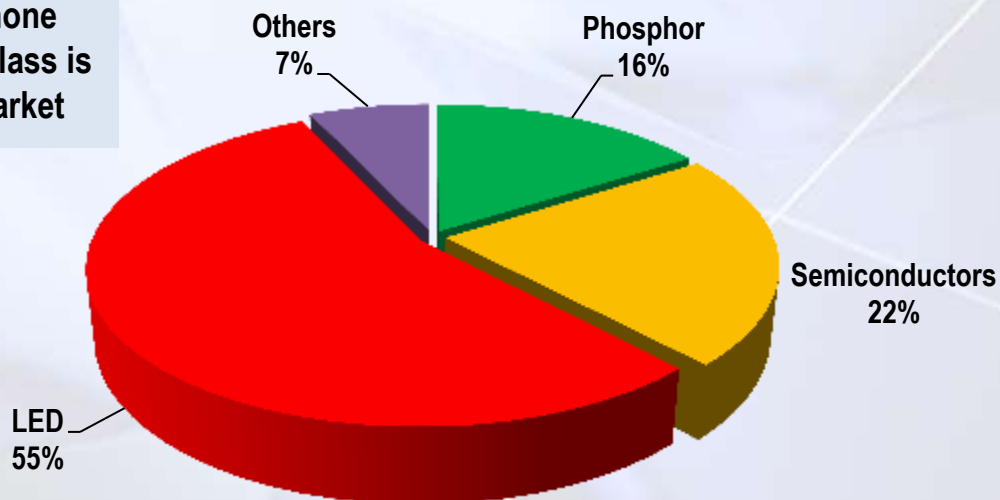
**Semi
conductors**

**Phosphor
Based
Applications**

**Other
Applications**

Uses of HPA
99.99% 4N

**Smartphone
sapphire glass is
a new market**



Technavio Research

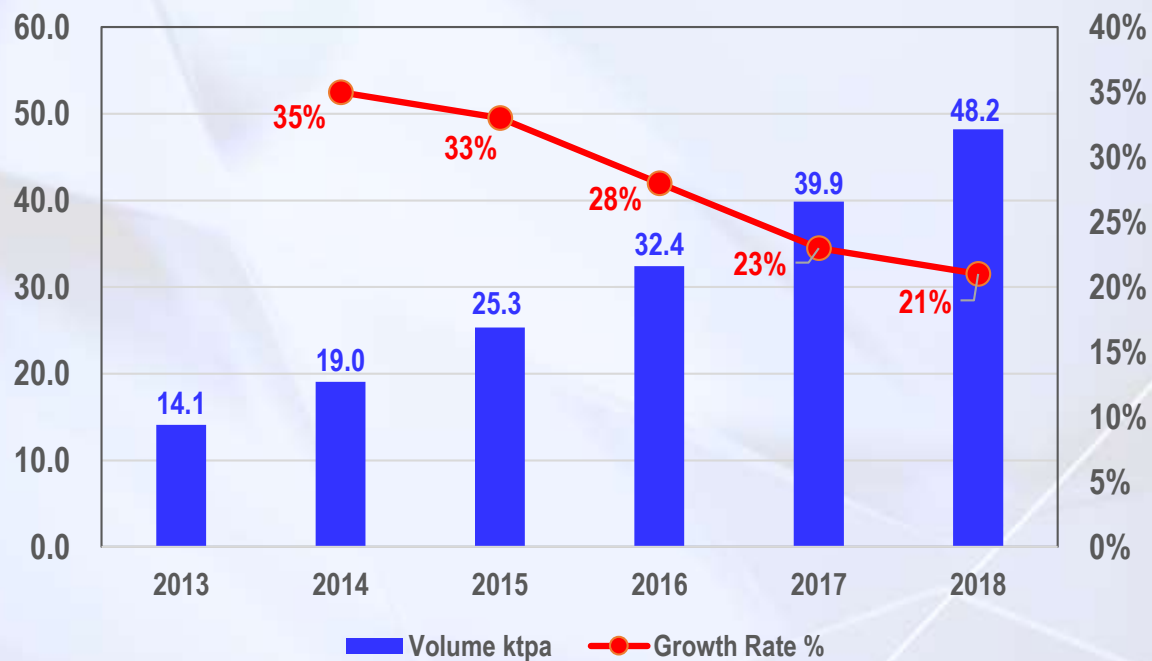
- Global HPA demand 19,040tpa in 2014
- Expected to increase to 48,230tpa by 2018
- Growing at a CAGR of 28%

QY Research

- Global HPA demand 24,550tpa in 2014
- Expected to grow to 36,000tpa in 2017
- Growing at a CAGR of 16%

**Demand
for HPA**

HPA Demand & Growth Forecast



**Demand
for HPA**

- Rapid growth rates
- Estimated supply deficit

- Estimate 30g¹ of HPA in an iPhone sapphire glass screen
- 500 million smartphones sold per year
- If sapphire glass technology was implemented
 - It would require about 15,000tpa of HPA
 - That's four of our proposed 4,000tpa plant
- There will be a HPA supply deficit
- Altech is in the right space!

Sapphire glass in smartphones

Non-scratch sapphire glass

**HPA
demand:
smartphones**

Vertu TI luxury mobile phone

- High end Vertu TI with sapphire crystal screen
- Rest will follow

Huawei beats Apple to sapphire glass smartphone

By *Reuters Staff* on Sep 7, 2014 10:11 PM
Filed under *Mobility*

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High-spec features for limited-edition Aspire.

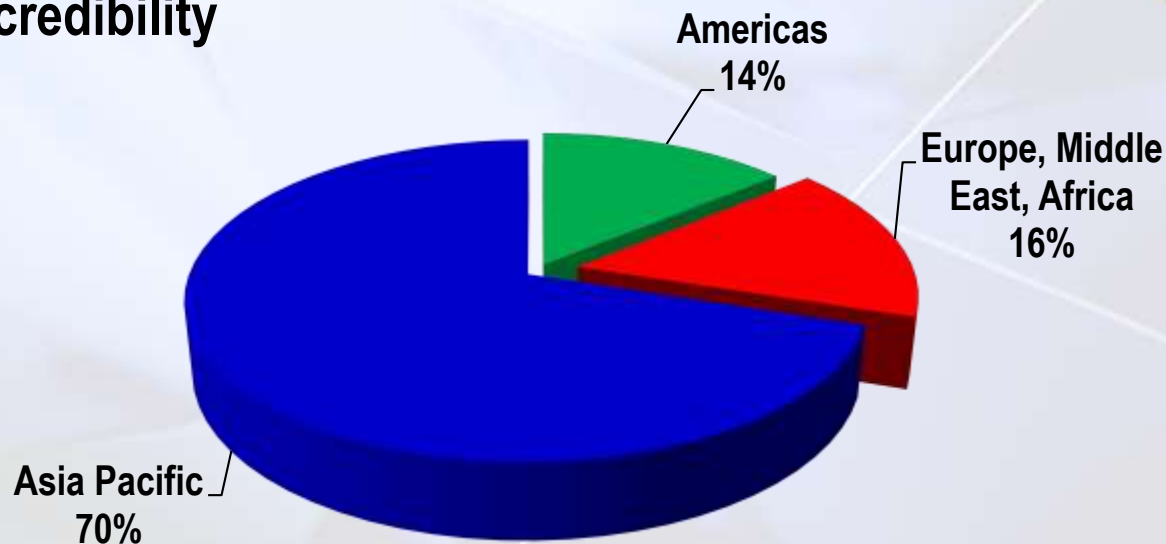
Huawei Technologies has unveiled a slate of new devices meant to showcase the Chinese company's hardware technology, just days before Apple releases its highly anticipated iPhone 6 on 9 September.

Huawei, which began as a telecom equipment company in 1987, has rapidly

Smartphones
sapphire crystal
screen

HUAWEI

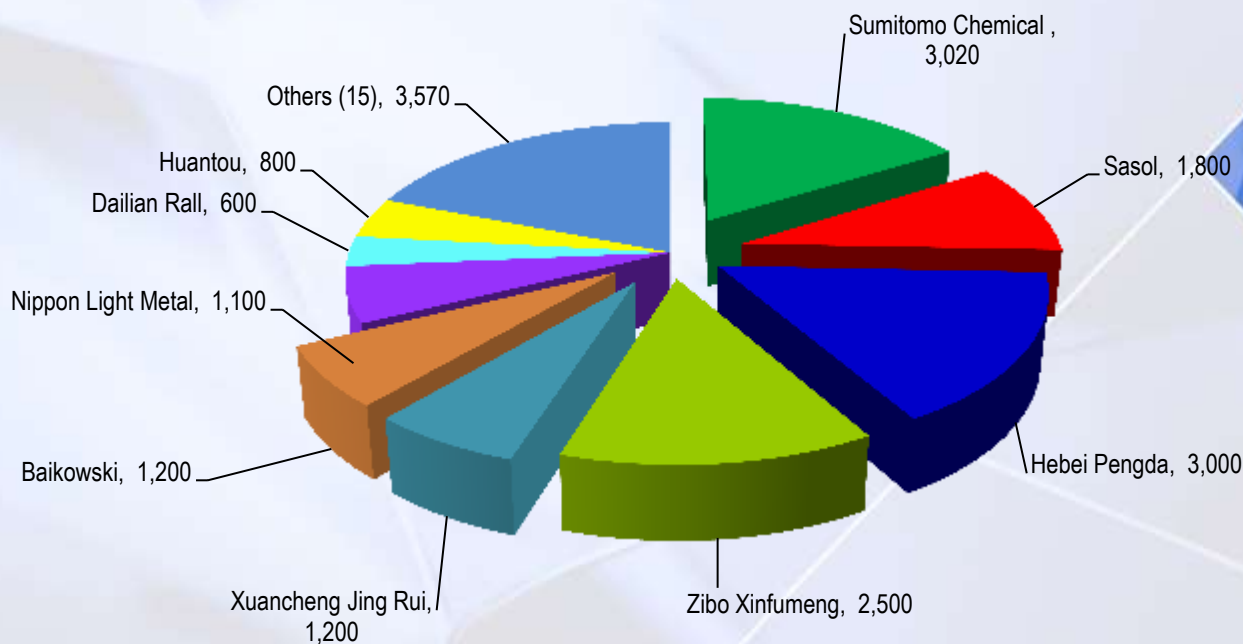
- **70% of HPA demand is in Asia Pacific region (APEC)**
 - **Region for the world's manufacturing**
- **Altech's HPA plant (Malaysia) well-positioned to service in APEC region**
- **Transport, customer service, technical credibility**



**HPA
geographic
demand**

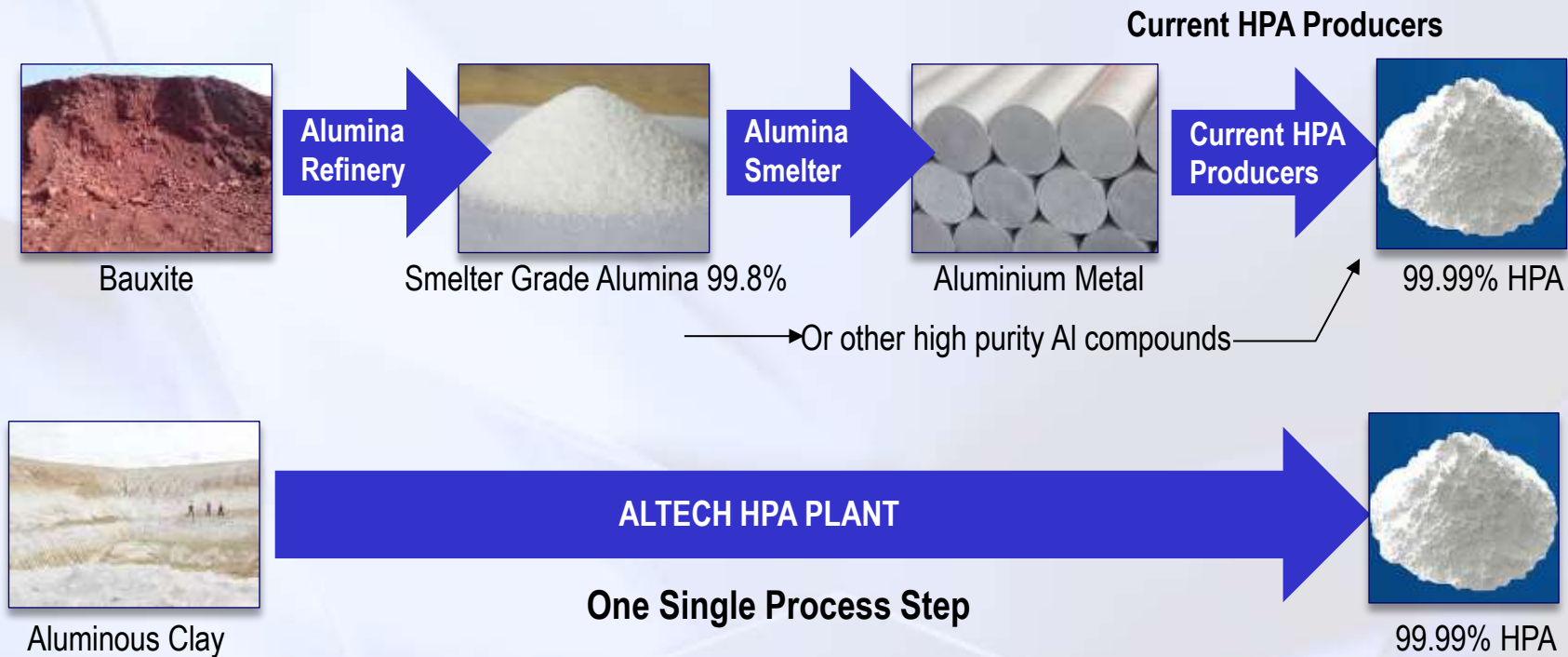


- 6 largest HPA producers
- 3 Chinese, 1 Japanese, 1 Sth African, 1 French



**HPA
Producers**

ALTECH'S DIFFERENTIATION



- Processed and purified by mother nature
- Very low impurities due to weathering
- Iron levels are 0.7% vs 21% in bauxite
- Silica is non reactive – easily removed

	Bauxite Darling Range	Canadian HPA Project	Altech HPA Project
Al ₂ O ₃ (%)	34.5	22.77	30.5
SiO ₂ (%)	21.5	53.29	56.3
Fe ₂ O ₃ (%)	21.2	8.36	0.7
TiO ₂ (%)	2.00	0.98	0.7

Typical Mean Analysis

Typical bauxite deposit

Altech aluminous clay deposit

**Low-impurity
aluminous clay
feedstock**



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- **Majors like Sumitomo, Sasol:**
 - *Aluminum alkoxide from Al metal (1)*
- **Chinese producers:**
 - *Choline – Dissolving Al foil in choline*
- **Chinese producers:**
 - *Aluminium Hydroxide (2) with HCl*
- **All use relatively expensive feedstock**
- **Altech aluminous clay 5 times cheaper than Al metal (3)**

**Current HPA
producers**

Route	HPA Process Method	Feedstock Costs USD/t per 100% Al ₂ O ₃
1	Aluminium Metal	\$1,052 /t
2	Aluminum Hydroxide	\$570 /t
3	Altech Aluminous Clay	\$220 /t



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- **Altech owns 100% of deposit**
- **Landowner agreement in place**
- **No native title**
- **Low environmental impact**
- **Previously mined for kaolin – trial pit**
- **Low stripping ratio**
- **65Mt JORC Resource**
- **130kms from Fremantle Port**



**Meckering
aluminous clay
deposit**



- Use a standard HCl leach process
- Standard metal extraction
- Developed in 1980's by alumina industry
- Couldn't compete with bauxite SGA costs
- Great at producing HPA (no sodium ions)
- No demand of HPA in 1980s
- Conventional & off the shelf equipment
- Simple recovery of acid and recycling

**Altech's
HPA
process**



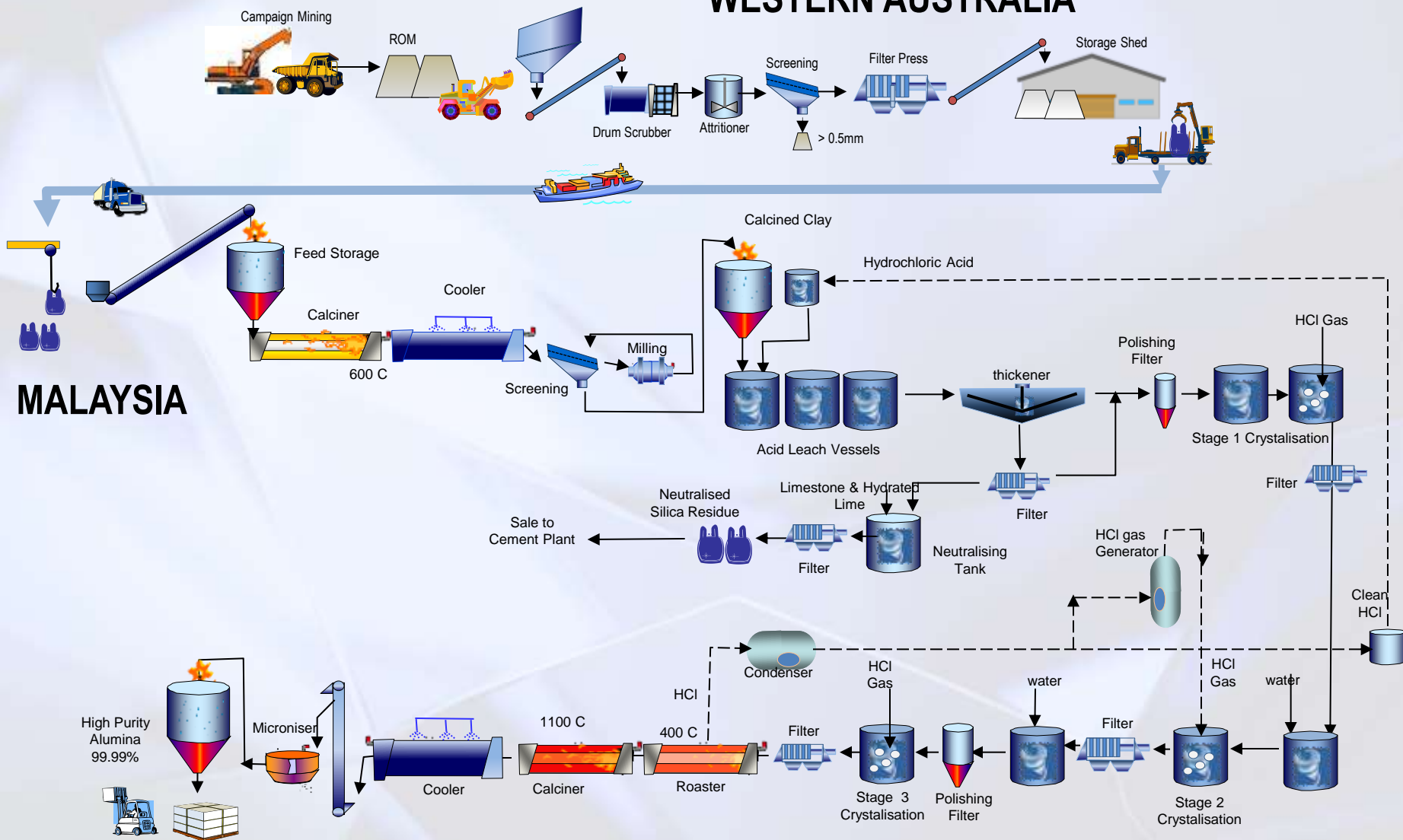
- **Laboratory test work simulates process**
- **Final 99.99% (4N) HPA produced**
- **Integrated Plant Study (IPS) completed**
- **Process works and is robust**
- **Towards larger commercial plant**
- **IPS pilot plant opex around A\$8.6/kg**
- **HPA sells for US\$20-\$25/kg**



**Our success
so far**



MALAYSIA

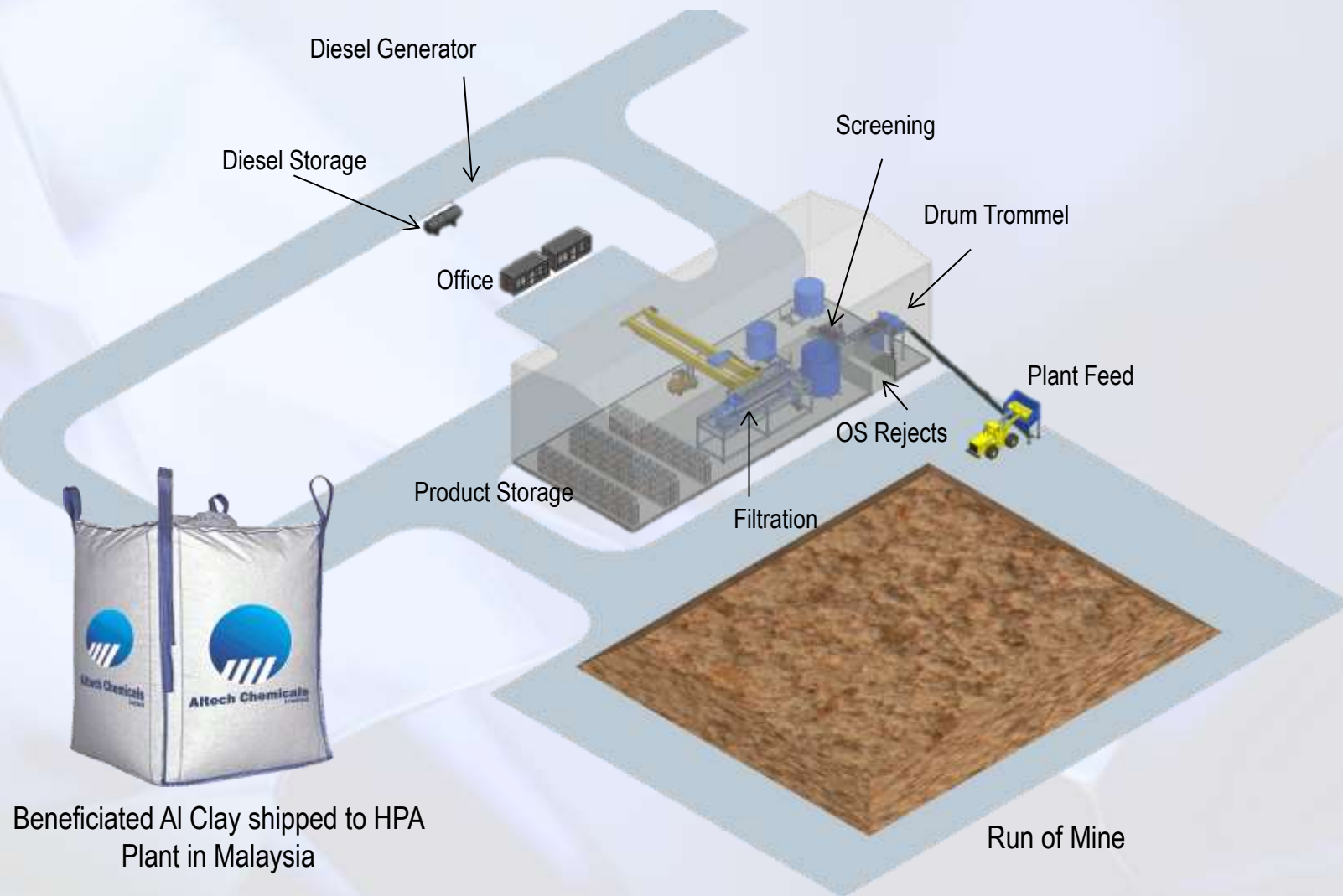


- **Target: to be a top HPA producer in the world**
- **Launched BFS for 4,000tpa HPA**
 - **BFS completion: end Q3 2015**
- **In parallel, progress necessary approvals, funding, off- take agreements etc.**
- **Subject to funding:**
 - **In position to order long lead capital items**
 - **Then detailed design, site works, construction**
- **Continuous laboratory pilot plant work**

Bankable Feasibility Study (BFS)



AUSTRALIAN OPERATION





Altech Chemicals
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- **Tanjung Langsat Industrial Park, Johor Bahru (Malaysia)**
- **Al clay feedstock shipped from WA**
- **Operating costs ~40% lower than Australia**
- **Capital costs expected to be 50-60% lower**
- **Anticipates opex in the bottom quartile of the cost curve for international HPA producers**
- **Letter of Intent (LOI) submitted for land**
- **Appointment of JB environmental consultant to progress approvals**

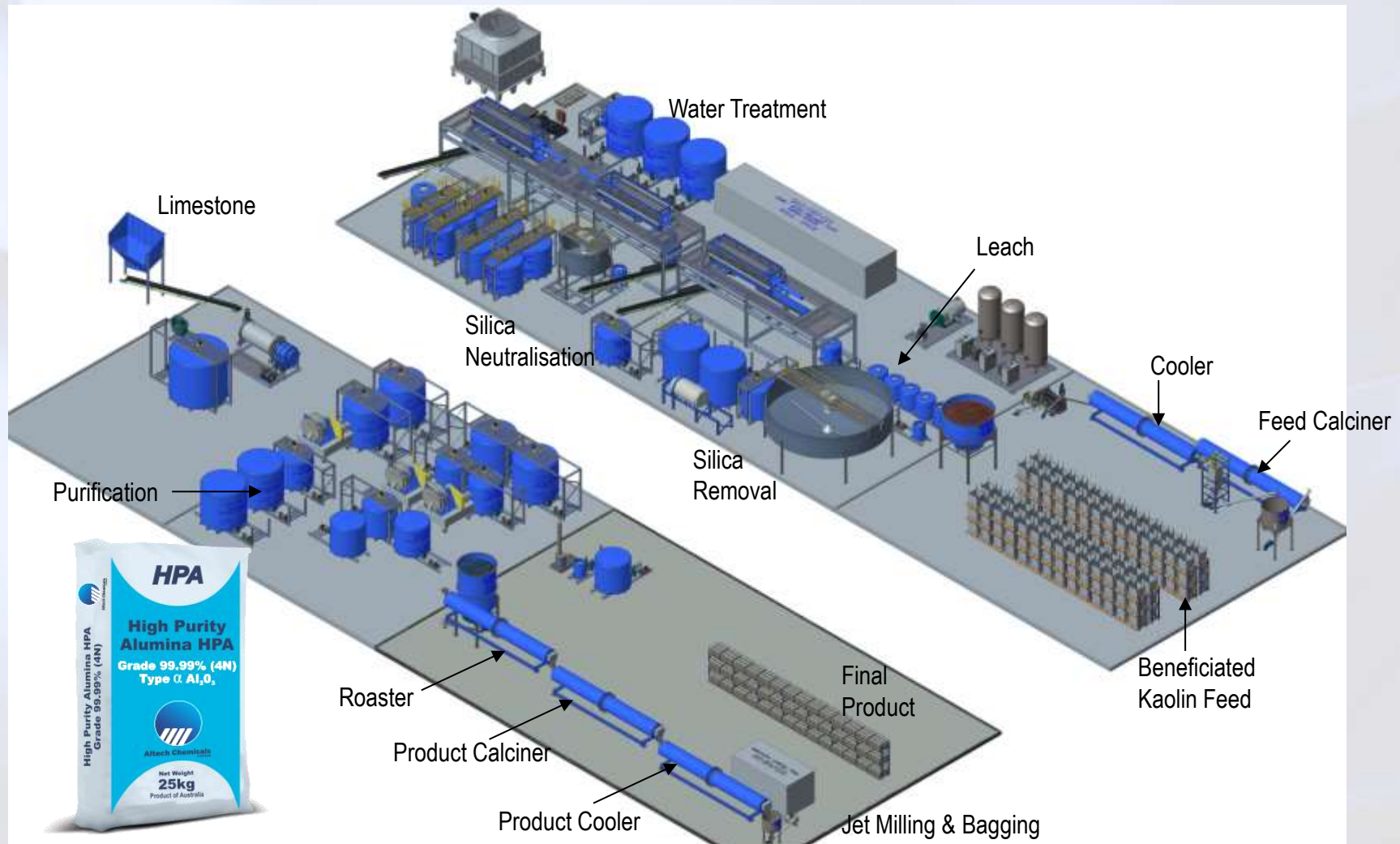
**HPA Preferred
Location**

ALTECH'S PREFERRED SITE LOCATION



- Hydrochloric acid, sulphuric acid, power & natural gas
- Cement plants to purchase silica residue
- Skilled labour, telecommunications
- International container sea-port & Singapore
- Investment incentives

MALAYSIA HPA OPERATION



Highly experienced board:

- Fundraising
- Project building
- Industrial chemical processing
- Alcoa Alumina management
- Sherwin Alumina management
- High purity chemicals



Iggy Tan
Managing Director



Luke Atkins
Chairman



Dan Tenardi
Non Exec Director



Peter Bailey
Non Exec Director

**Experienced
board**

Corporate Snapshot

ASX Code	ATC
Shares on Issue	111.5m
Share Price ¹	A\$0.80
Market Capitalisation (Undiluted)	A\$8.9m
Options on Issue	21.5m

Major Shareholders

Board & Management	36%
Top Twenty Shareholders	25%

Cash Position

\$

Cash	A\$ 1.2m
Debt ²	A\$ 0

ASX Share Price Performance



- ¹Closing price on 17 November 2014 ²As at 17 November 2014 ³As at 17 November 2014.



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- Midpoint Evaluation of \$0.25 / share
- Only 7.5% of full project value – early stage

EV/EBITDA Multiple Valuation

- 7.5 x EV / EBITDA multiple, Price \$20/kg, Opex \$8/kg = \$360m evaluation

DCF Valuation

- Disc @10%, Price \$20kg, Opex \$8/kg = \$260m Evaluation

Breakaway Research Evaluation

Indicative EV/EBITDA Valuation – 4,000tpa 4N HPA Operation

		Total Operating Cost (A\$/tonne)				
		\$7,000	\$8,000	\$9,000	\$10,000	\$11,000
4N HPA Price	\$17,500	\$315m	\$285m	\$255m	\$225m	\$195m
	\$20,000	\$390m	\$360m	\$330m	\$300m	\$270m
	\$22,500	\$465m	\$435m	\$405m	\$375m	\$345m
	\$25,000	\$540m	\$510m	\$480m	\$450m	\$420m
	\$27,500	\$615m	\$585m	\$555m	\$525m	\$495m

Source: Breakaway analysis

***Right Place
Right Time
Right Feedstock
Right Technology***



Thank you



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.

Competent Person Statement

Technical information in this report is based on information compiled by B.Sc. Geology, Altech Chief Geologist and a member of the Australasian Institute of Geoscientists. Mr O'Mara has sufficient exploration experience which is relevant to the styles of mineralisation and types of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' ("JORC 2004"). Mr O'Mara consents to the inclusion in this release of the matters based on his information in the form and context in which it appears.