Altech Chemicals Limited ASX: ATC FRA:A3Y

Company Presentation

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Managing Director
20 August 2018

Altech Chemicals Limited

Altech Chemicals Limited

World leading producer of high purity alumina (HPA)

4,500 tonnes pa

Our Vision

Sapphire Gemstone

- Sapphire gemstone
- 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)

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What is HPA?

- 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 a problem for sapphire and lithium batteries

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High price for purity

HPA substrate for LEDs

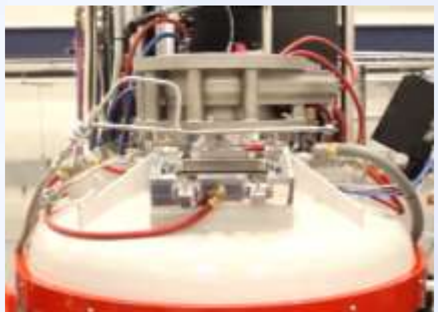
			
Smelter Grade Alumina SGA 99.5% US$400 per t	**High Purity Alumina HPA 99.9% (3N)** US$6,000 per t	**High Purity Alumina HPA 99.99% (4N)** US$27,000 per t	**High Purity Alumina HPA 99.999% (5N)** US$50,000 per t

Our Target Business

4N HPA produces synthetic sapphire glass

LEDs & LITHIUM-ION BATTERIES

Sapphire Furnace (2,000 °C)



Sapphire Crystal Boule

Sapphire Wafer

LEDs

Nano Powder

Separator Coatings

LITHIUM ION BATTERIES

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LED Expansions

Osram opens $440M Malaysian plant amid world's widening clamor for LED chips (UPDATED)

NOVEMBER 24, 2017 BY RAHUL1

Energy Efficient Lighting Market Rising at a CAGR of 13.4% from 2016 to 2024, will reach to US$15 bn by 2024

LED UPSTREAM | LED APPLICATIONS |

ARTICLE COMMENTS (0) RELATED CONTENT

PRINT EMAIL

Sanan Optoelectronics to set up LED production base in southeastern China

Siu Han, Taipei; Adam Hwang, DIGITIMES [Thursday 7 December 2017]

The largest China-based LED epitaxial wafer and chip maker Sanan Optoelectronics has announced it will invest CNY33.3 billion (US$5.03 billion) to set up an LED production base in Quanzhou, southeastern China.

Xiamen Changelight Purchases AIXTRON MOGVD Technology to Expands ROY LED Production

Sapphire Glass Scratch Test

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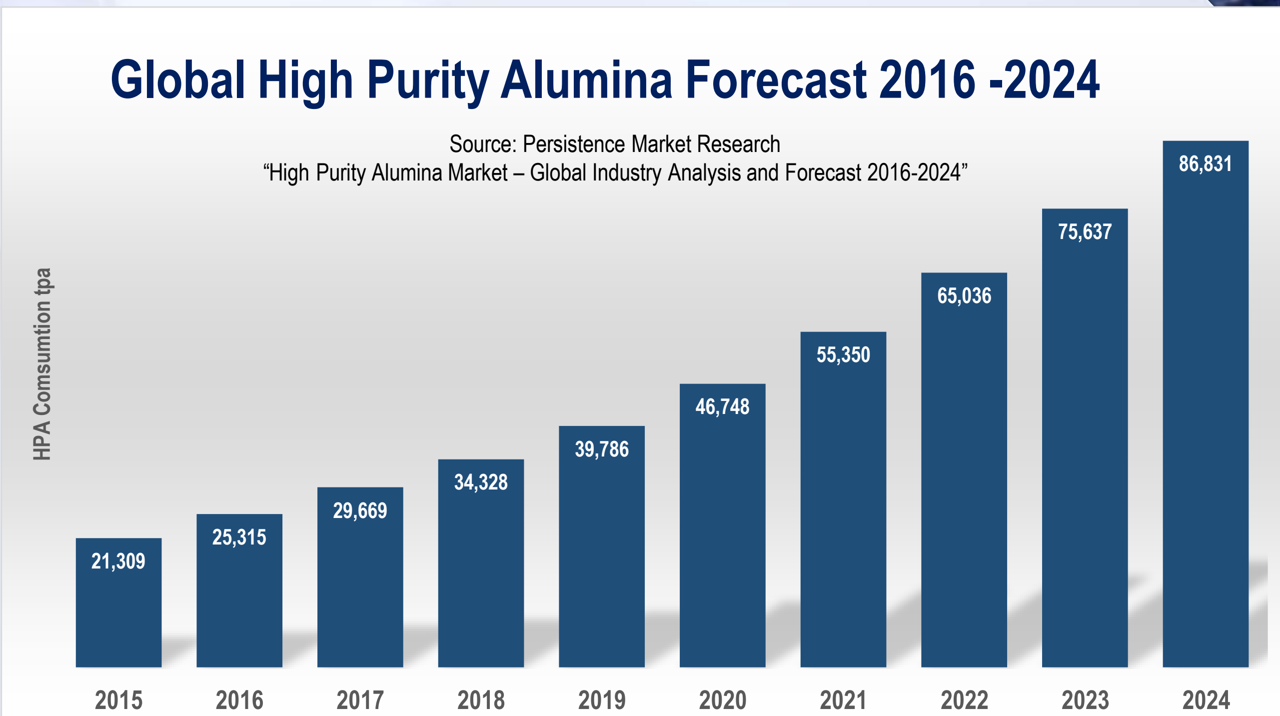
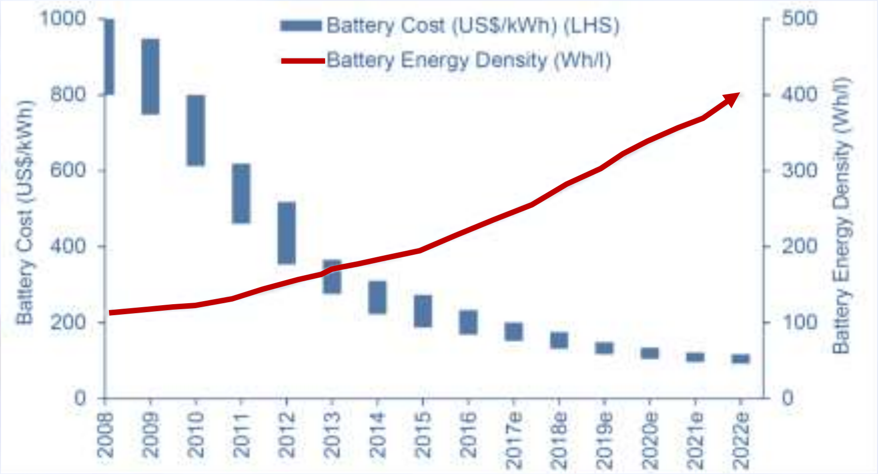
Demand for HPA



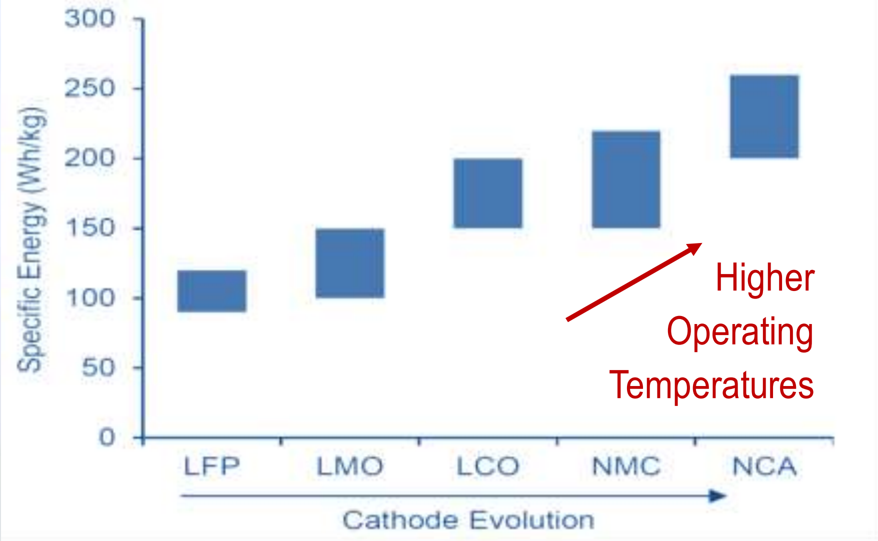
- **13 times ATC's 4,500 tpa required to meet growth**
- **Global LED demand increase to 4.1 B units by 2024 (2015: 864 million)**

Source: Navigant Research "LED Lighting: Global Outlook"

Battery Energy Density vs Temp

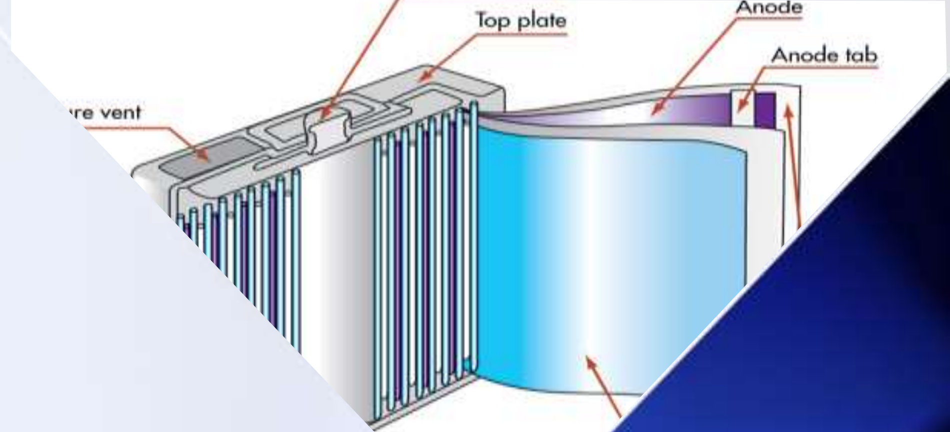


Battery costs are reducing due to increased energy density



Cathode changes increases energy density

Consequence – higher operating temperatures



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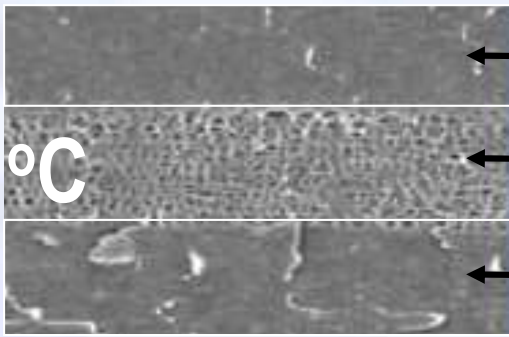
HPA required for higher temps

Normal Polymer Separators

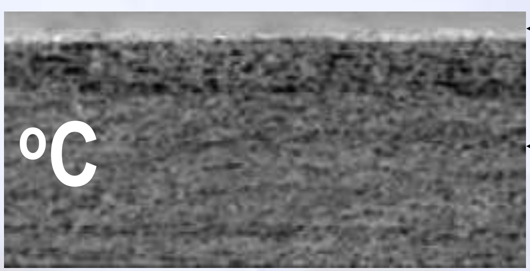


Polypropylene (PP) 155 ^{o}C

Polyethylene (PE) 135 ^{o}C

Polypropylene (PP) 155 ^{o}C

<135 ^{o}C



HPA layer

Polymer membrane

>200 ^{o}C

HPA Coated Separators (HPACS)

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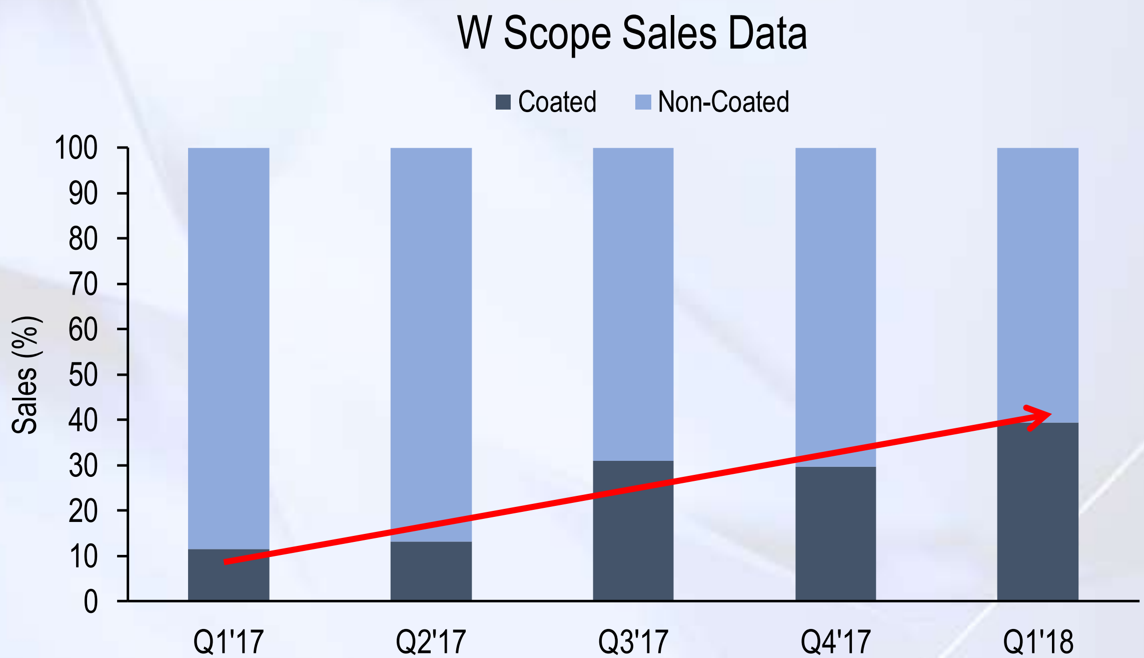
HPA Coated Separators



Japanese separator manufacturer reports
40% HPA coated separators
11% only 12 months ago

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Battery Separator Expansions

JAPAN-UPDATE

Asahi Kasei pours extra $268m into battery separator production

Electric car demand and Chinese rivals spark upgraded investment plans

BUSINESS

W-Scope boosting separator output in South Korea

October 14, 2015 23:24 JST

BUSINESS

Toray to lift South Korean capacity for battery material

Growing demand for electric vehicles seen justifying $300mn investment

BUSINESS TRENDS

Japan's materials makers see gold in fast-changing auto sector

Mitsui Chemical, Asahi Kasei and peers tap expertise in car parts design

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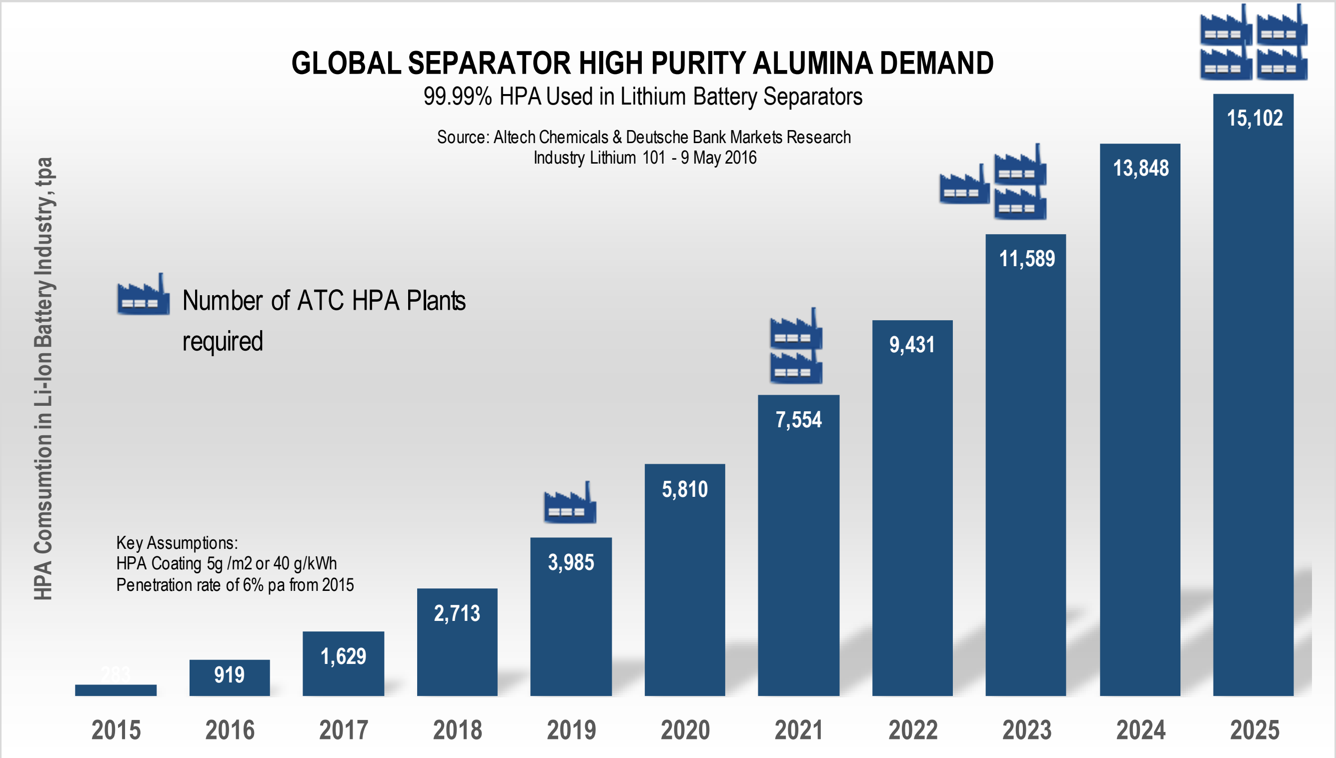
Altech 2016 Separator HPA Forecast

- 1.6 kg HPA for average EV car (40 KWh)
- 6.4 kg HPA for EV Bus (160 kWh)



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Other Separator Forecast 2018

Organisation	Separator HPA Demand Forecast 2025 (tpa)	Equivalent Number of Altech HPA Plants
Altech Chemicals	15,102	3.4 x
Petra Capital (mid case)	37,500	5.1 x
CRU Consulting	76,000	16.9 x
Average	38,034	8.5 x

- CRU most bullish on separator HPA growth
- Ave forecast of 38k tpa HPASC by 2025 (8.5 times ATC plant)

Total HPA Forecast (inc LEDs) 2018

Organisation	Total HPA Demand tpa 2025	Equivalent Number of Altech Plants
Persistence	62,519 tpa	14 x
Petra Capital	122,000 tpa	27 x
CRU Consulting	92,900 tpa	20 x
Average	92,473 tpa	20 x

- Ave forecast of 92 k tpa by 2025 (20 times ATC plant)
- No incumbent expansions announced
- New entrants 4-5 years behind
- Demand will outstrip supply

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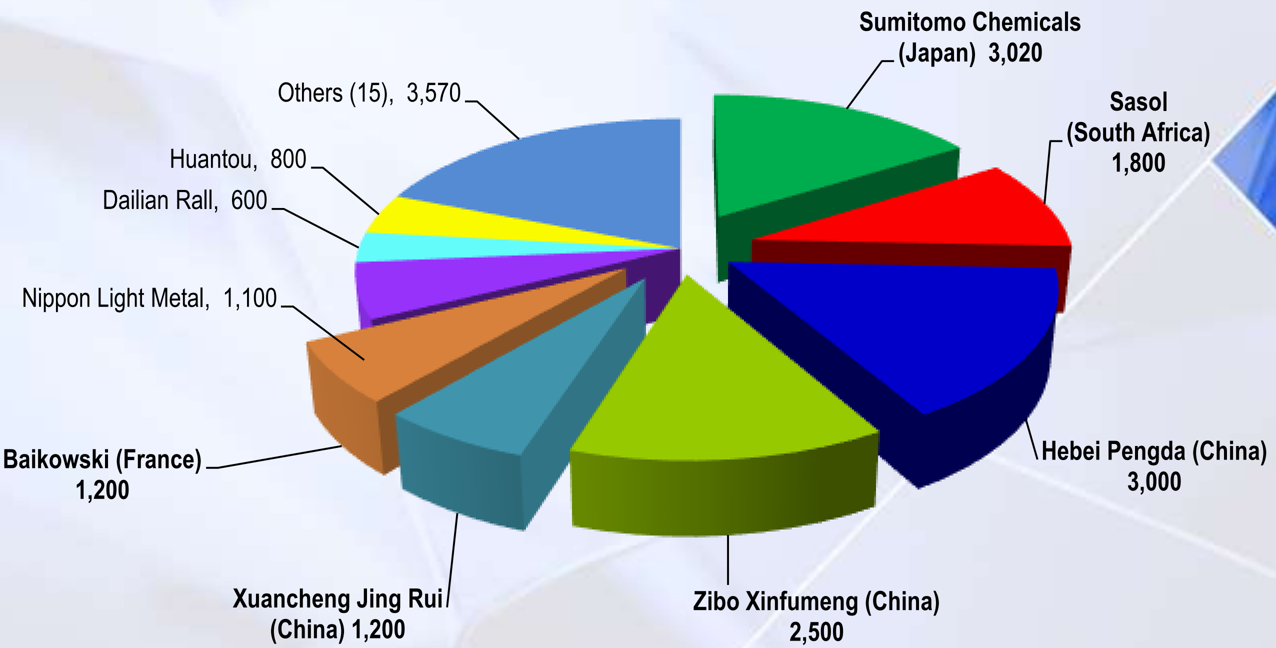
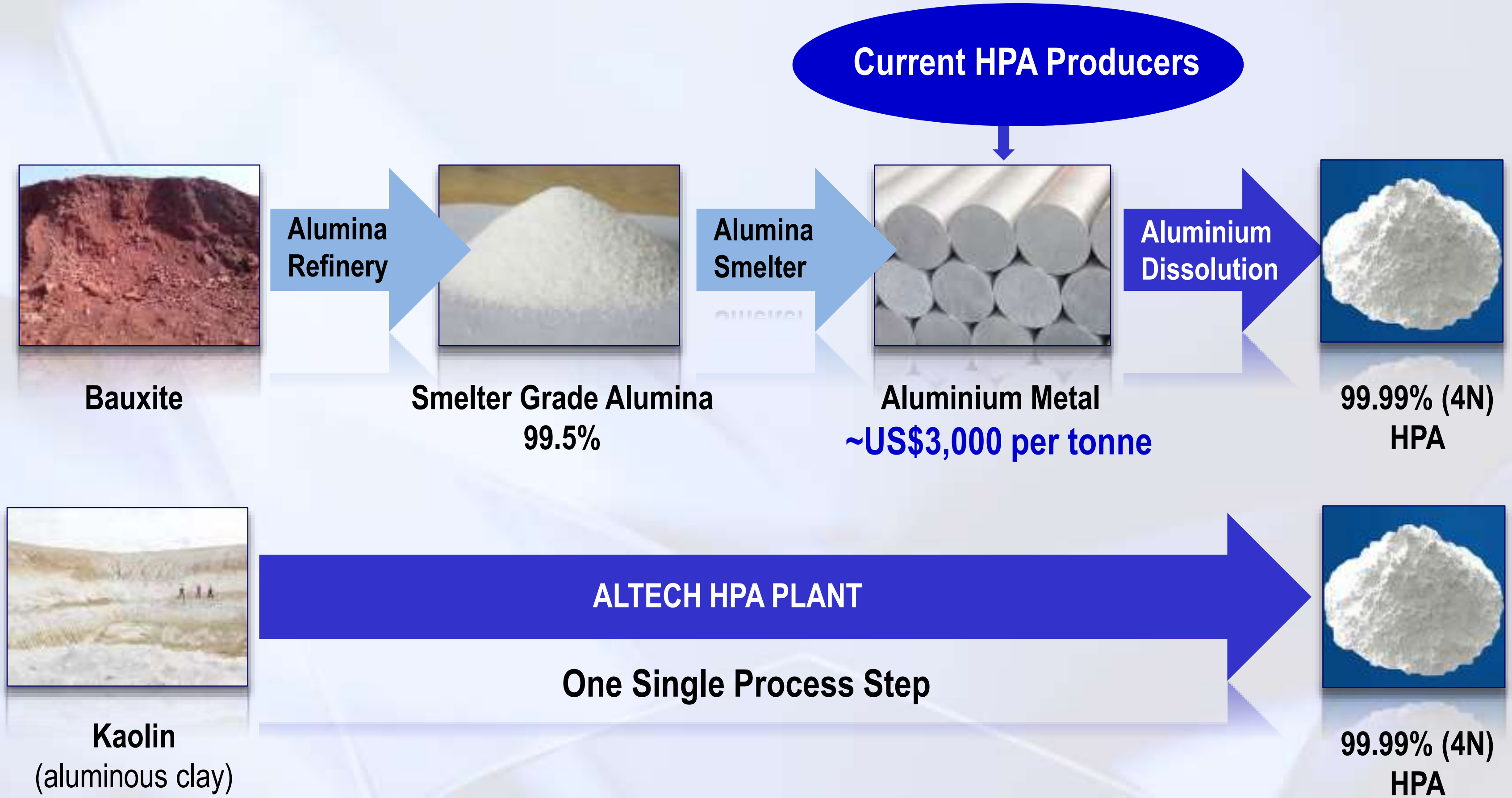
Current HPA Producers

- HPA producers – Chemical companies
  China (3), Japan (2), South Africa (1) France (1)



Source: Technavio Research

Altech's Differentiation



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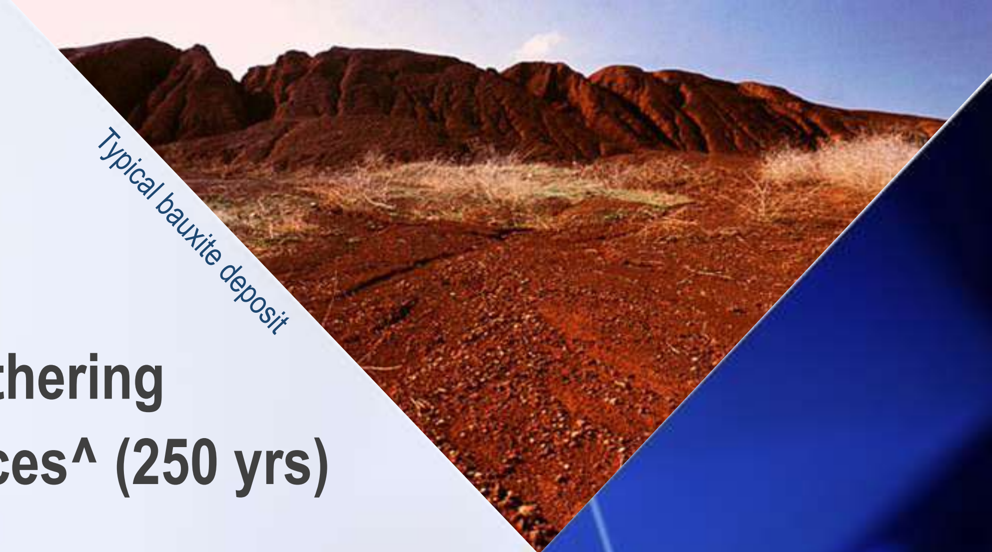

- **Very low iron (Fe) due to weathering**
- **12.7Mt JORC Mineral Resources^ (250 yrs)**
  - Measured Resources 1.5Mt @ 30% Al_2O_3
  - Indicated Resources 3.3Mt @ 30% Al_2O_3
  - Inferred Resources 7.9Mt @ 29.1% Al_2O_3
- **Deposit in Western Australia**

Low-Impurity Kaolin Feedstock

%	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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Meckering Kaolin Deposit in West Aust

- Mining approval granted
- Works approval granted
- Simple free dig mining
- Campaign mining, 2 months - 3 years feed
- Then just sea container loading operation
- Fremantle to Johor easy shipping

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HPA Plant to be in Johor, Malaysia

- Chemical-zoned industrial park
- 60% lower operating costs
- HCl plant nearby
- Services, natural gas, electricity, water
- Access to 17th largest container port
- 5-10 year corporate tax free
- Site clearance completed

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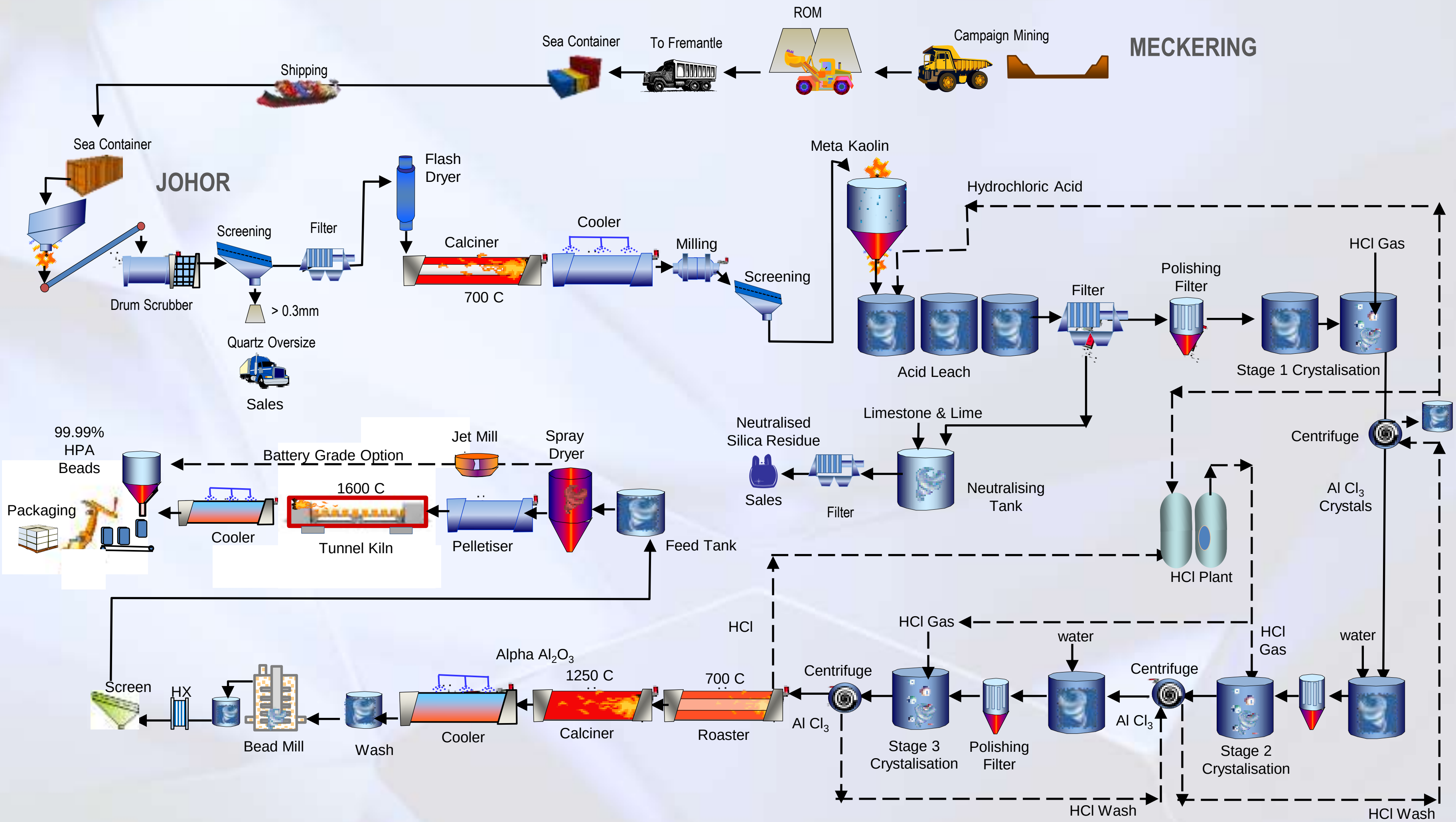
Altech's HPA Process



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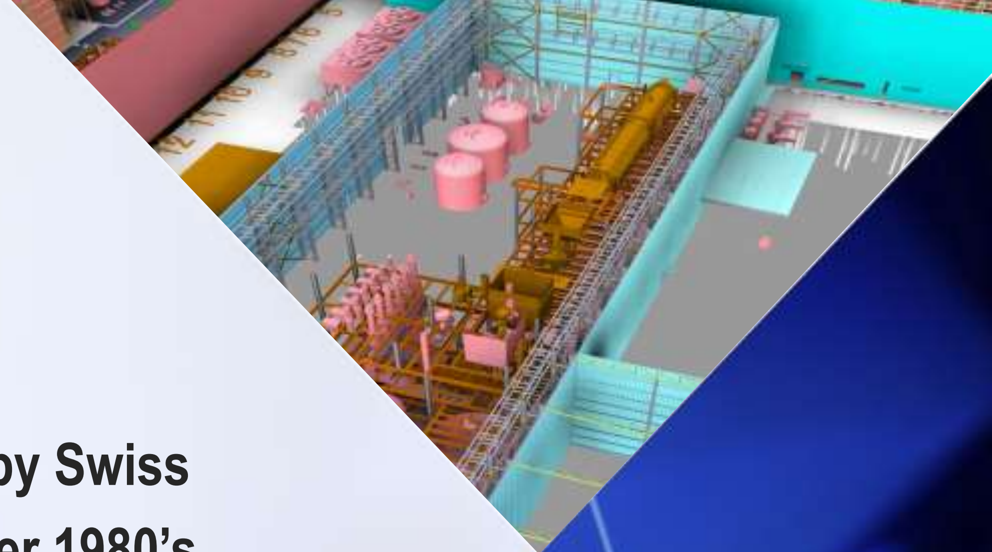
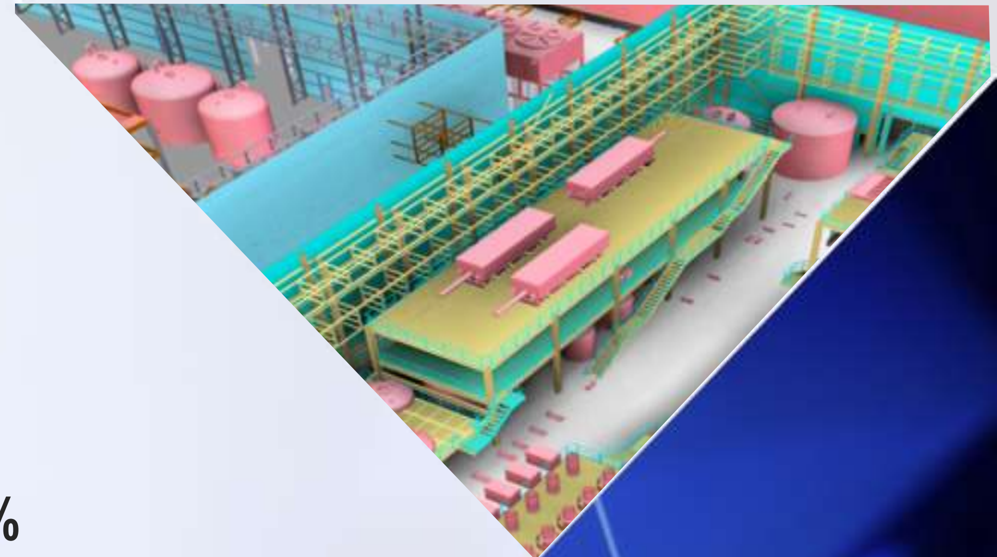


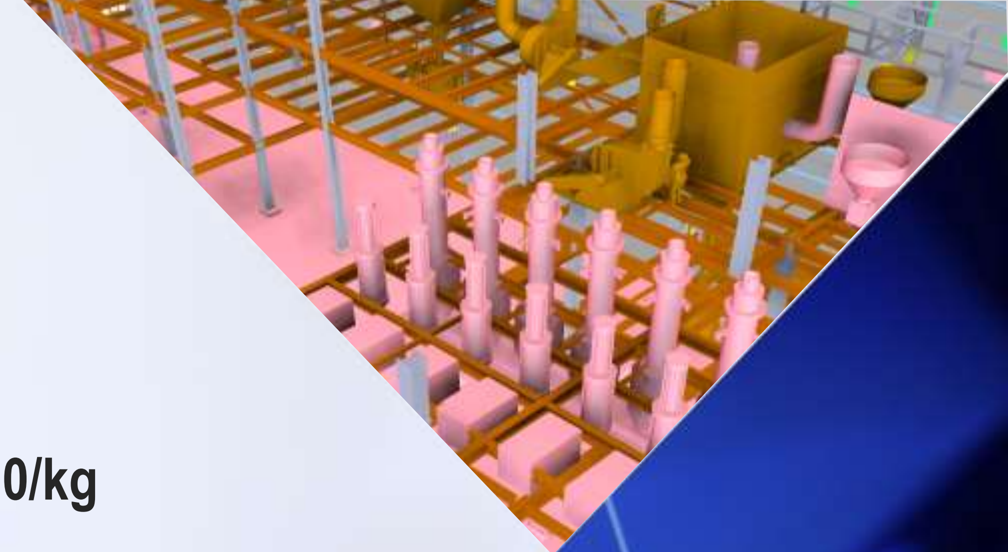
Established Proven Chemistry

- Chemistry established in 1900s by Swiss
- US Gov & Alcoa developed further 1980's
- No demand for HPA in 1980's
- New HPA growth demand (LEDs LIBs)
- Altech applied open chemistry to Meckering
- Very successful, disruptive, lowest cost
- Two patents established for processing technology
- New entrants - possible breach of Altech patents



- 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
- Production Costs - US$ 9.90/kg
- LT Sale Price - US$ 26.9/kg
- Gross Margin – 63%

Conservative Bank Model



Current Case Economics

- 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%

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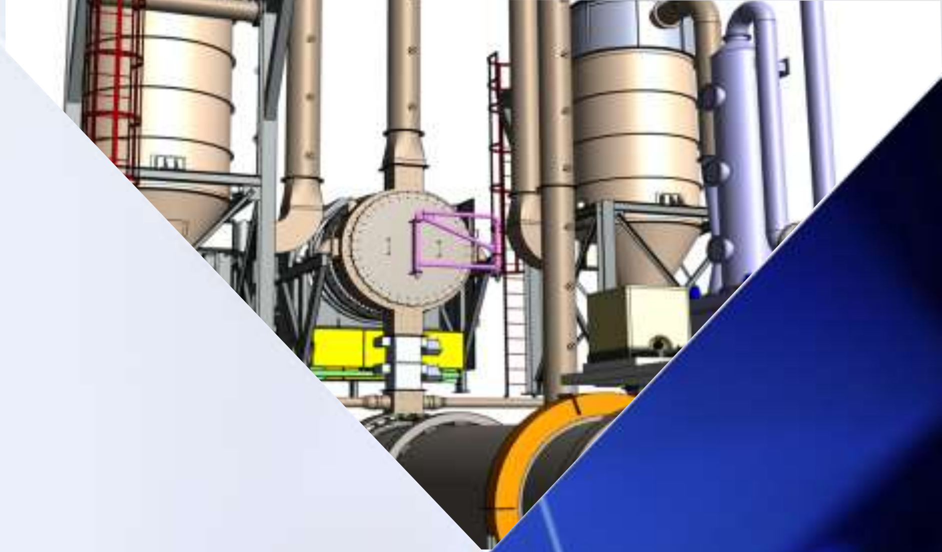
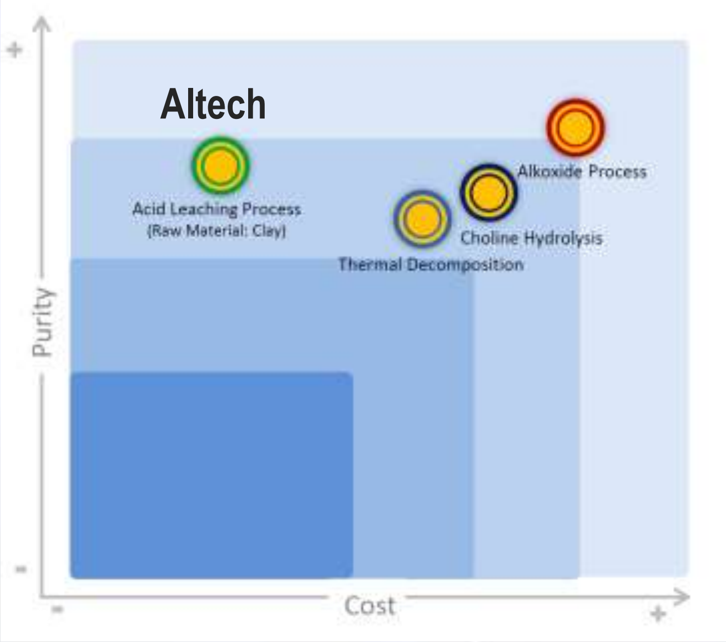


- **Competitors**
  1. **We own our feedstock**
  2. **Main reactant HCl re-used**
  3. **Plant in low cost country (Malaysia)**



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

Bottom Quartile for Op Costs

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

Mitsubishi 10 year off-take

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- SMS group German EPC contractor
- Lump sum turn key contract
- Completion and cost risk
- Throughput guarantee
- Process & quality guarantee
- Third largest user of ECA finance
- Committed US$ 15 mil equity

Lump Sum Turn Key Contract

SMS group

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Managing Technical Risks

Lab Pilot Work

	Typical/Testwork	Current Design
Utilisation	90%	79%
Recovery	90%	60%
Ramp Up	2 Years	3 Years
Feed Rate	34% Al_2O_3	30% Al_2O_3
Eng Design Margin	+15-20%	+20-30%

Conservative design assumptions reduces technical risks and builds robustness

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Debt Funding Successful

- Debt funding with KfW IPEX-Bank
- Total debt of US$ 190 million
- US$ 170 million export credit finance
- 50% of plant – German suppliers
- Low interest, long tenure
- Best debt in the world

Advancing Final Stage Funding

Three work streams

1) Subordinated mezzanine debt

- **Term sheet received of US$90 m**
- **Stream term sheet of US$60m**

Due Diligence

2) Equity work stream

- **Lead - Petra Capital** Raised A$21.4m

3) Possible JV Partner

- **Partial project sell down**

Status of Funding Initiatives

Facility	Financier	Amount	Status
Senior Loan	KFW-IPEX Bank	US$ 190 million	Committed
Mezzanine Loan*	Global Merchant Bank	US$ 90 million	Indicative Term sheet
Stream Finance*	Global Investment Group	US$ 60 million	Indicative Term sheet
Total		US$ 340 million	

- US$ 340 million of financing facilities
- Mezz and Stream proceeding to final DD

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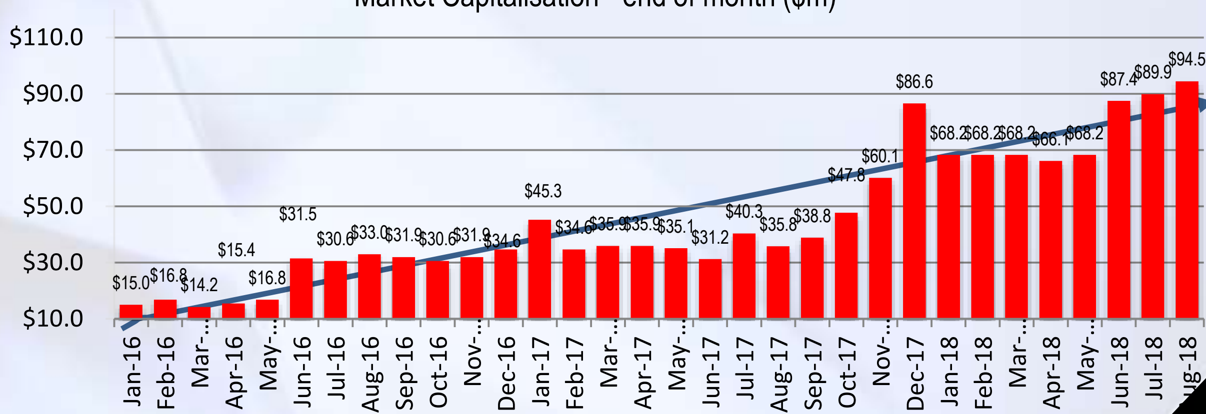

Altech Growth Performance

- 14 x steady market cap growth (4 years)
- Ave trade value $2k/day to $350k/day
- 480% increase in shareholders to 3,500
- Mar Cap $95m - 572 m shares
- Cash - $14 m


• A$ 21 million raised
• Stage 1 construction commenced
• Construction concurrent with debt finance close
• Site clearance completed


Altech Chemicals Sdn Bhd
GRAND OPENING
CEREMONY
8TH AUG 2018
HPA

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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.

The stream finance facility and the mezzanine finance facility referred to in this announcement are indicative in nature; are non-binding; and contain the general terms of a proposed transaction. Any future commitment will be subject to and is contingent upon all internal approvals of the financial institution as well as the completion of due diligence (including but not limited to legal and technical due diligence), legally binding documentation and acceptability to the senior lender (KfW IPEX-Bank). There is no certainty that the wither or both the stream finance facility or the mezzanine finance facility will be approved by the Company, other lenders or the proposed facility providers. There is no certainty that the transactions will be concluded based on what is presented in the facility term sheets. The Company makes no representations or warranties whatsoever as to the outcome of the stream or mezzanine finance processes.

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.