

Altech Chemicals Limited ASX: ATC FSE:A3Y

**Germany & USA Roadshow
Company Presentation**

**Iggy Tan
Managing Director**



**Altech Chemicals
Limited**





**World leading producer of
high purity alumina (HPA)**



4,500 tonnes pa

Our Vision





Altech Chemicals
Limited

- **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**



- 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?



**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

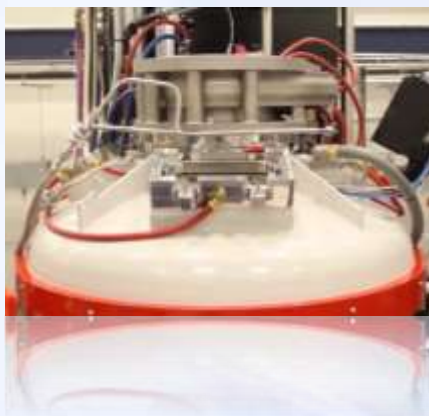
4N HPA produces synthetic sapphire glass

HPA substrate for LEDs

**High price
for purity**

LED's & LITHIUM BATTERIES

Sapphire Furnace (2,000 °C)



Sapphire Crystal Boule



Sapphire Wafer LEDs



Nano Powder



Separator Coatings



LITHIUM ION BATTERIES



Sapphire Applications

Sapphire Cores



Sapphire Wafer / Substrate



Sapphire Glass



LEDs

Light Emitting Diodes LED

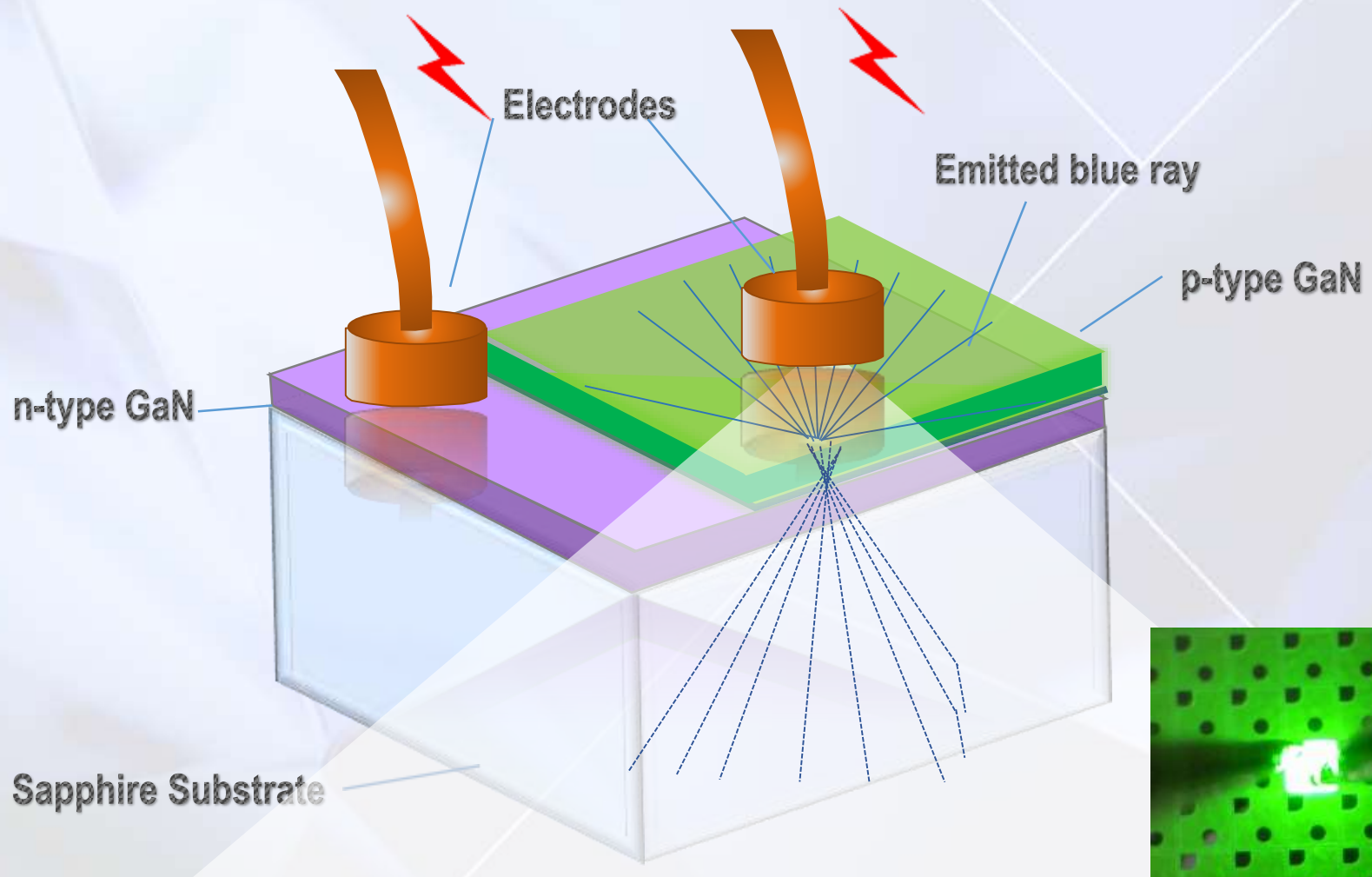


Smartphone and Lenses



Glass

Light Emitting Diode



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

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

Vertu TI luxury smartphone



HTC U Ultra (128Gb)

- February 2017
- Sapphire crystal display



iPhone

- Sapphire crystal lens
- Finger print recognition

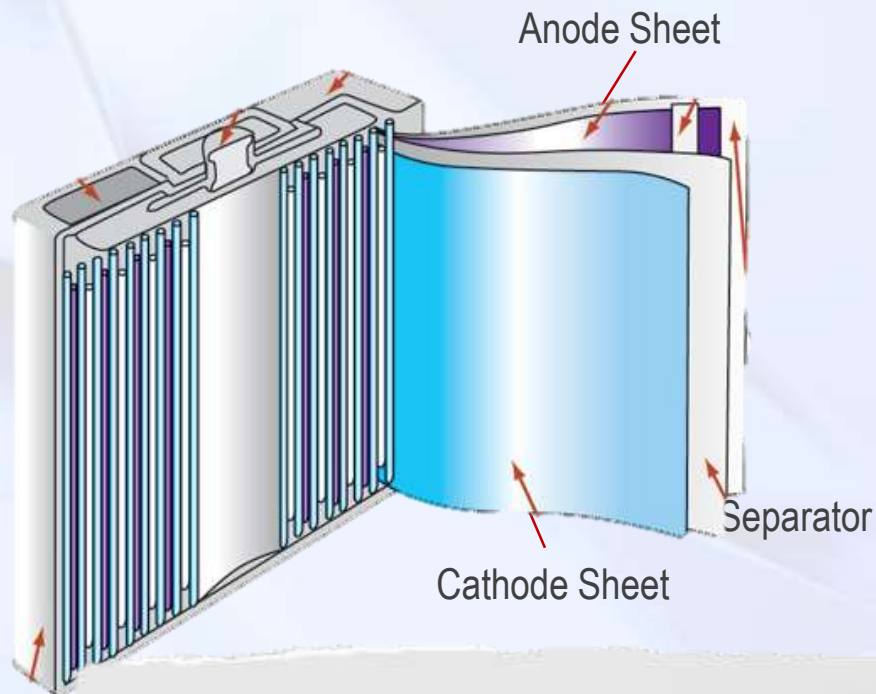
**Smartphone
sapphire screen**

HUAWEI

Sapphire Glass Scratch Test



HPA used in Lithium-ion Battery Separator

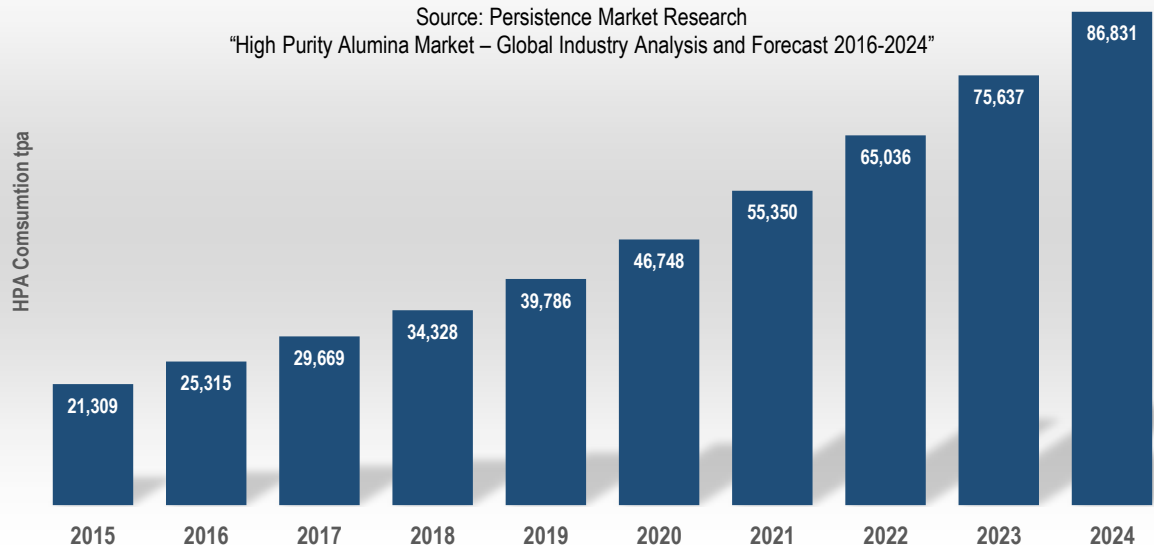


**Third-Generation Battery Safety Will Make
Current Battery Technology Obsolete**

Sep. 26, 2016 4:29 PM

Global High Purity Alumina Forecast 2015 -2024

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

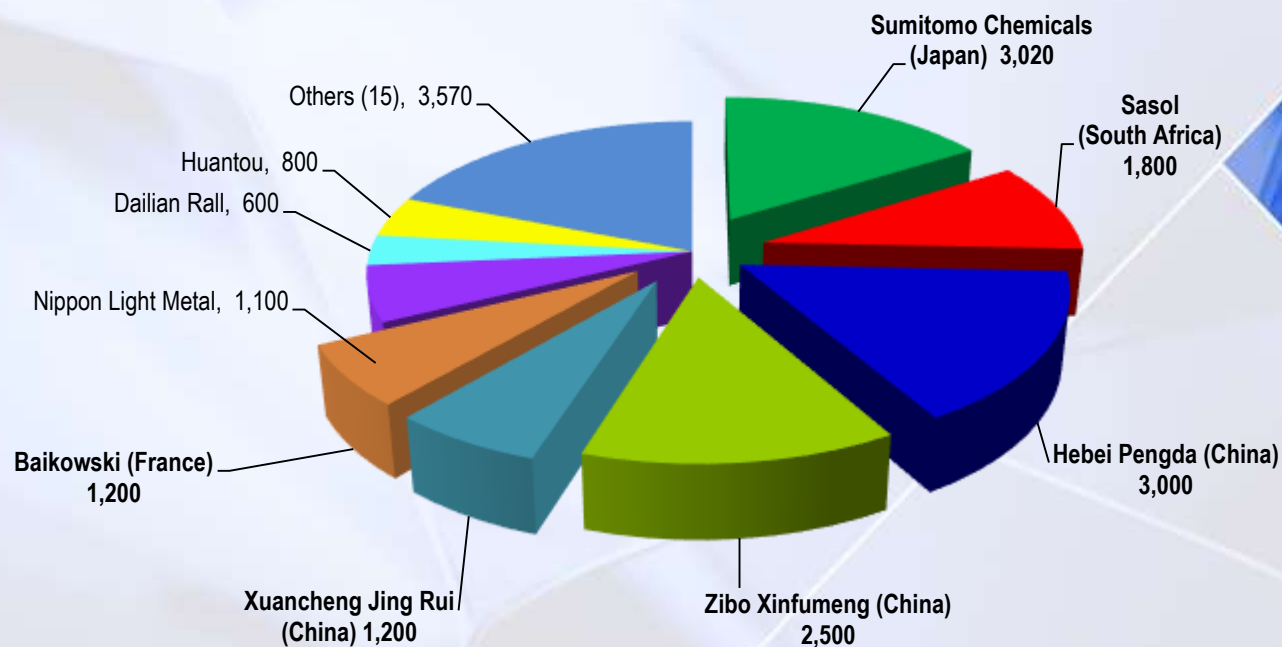


**Demand
for HPA**

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

Source: Navigant Research "LED Lighting: Global Outlook"

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



**Current HPA
Producers**

Altech's Differentiation

Current HPA Producers



Bauxite

Alumina
Refinery



Smelter Grade Alumina
99.5%

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

Typical bauxite deposit

- Very low iron (Fe) due to weathering
- **12.7Mt JORC Mineral Resources[^] (250 yrs)**
 - Measured Resources 1.5Mt @ 30% Al₂O₃
- **Deposit in Western Australia**

%	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
K ₂ O	0.24	3.41	0.1
NaO	0.005	1.42	0.1

Altech's kaolin deposit

**Low-impurity
Kaolin Feedstock**

* 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.



Altech Chemicals
Limited

- Mining approval granted
- Works approval granted
- Option to purchase land exercised
- Simple mining – 3 years feed in 2 months
- Then just sea container loading operation
- Fremantle to Johor easy shipping



Meckering Kaolin Deposit in West Aust





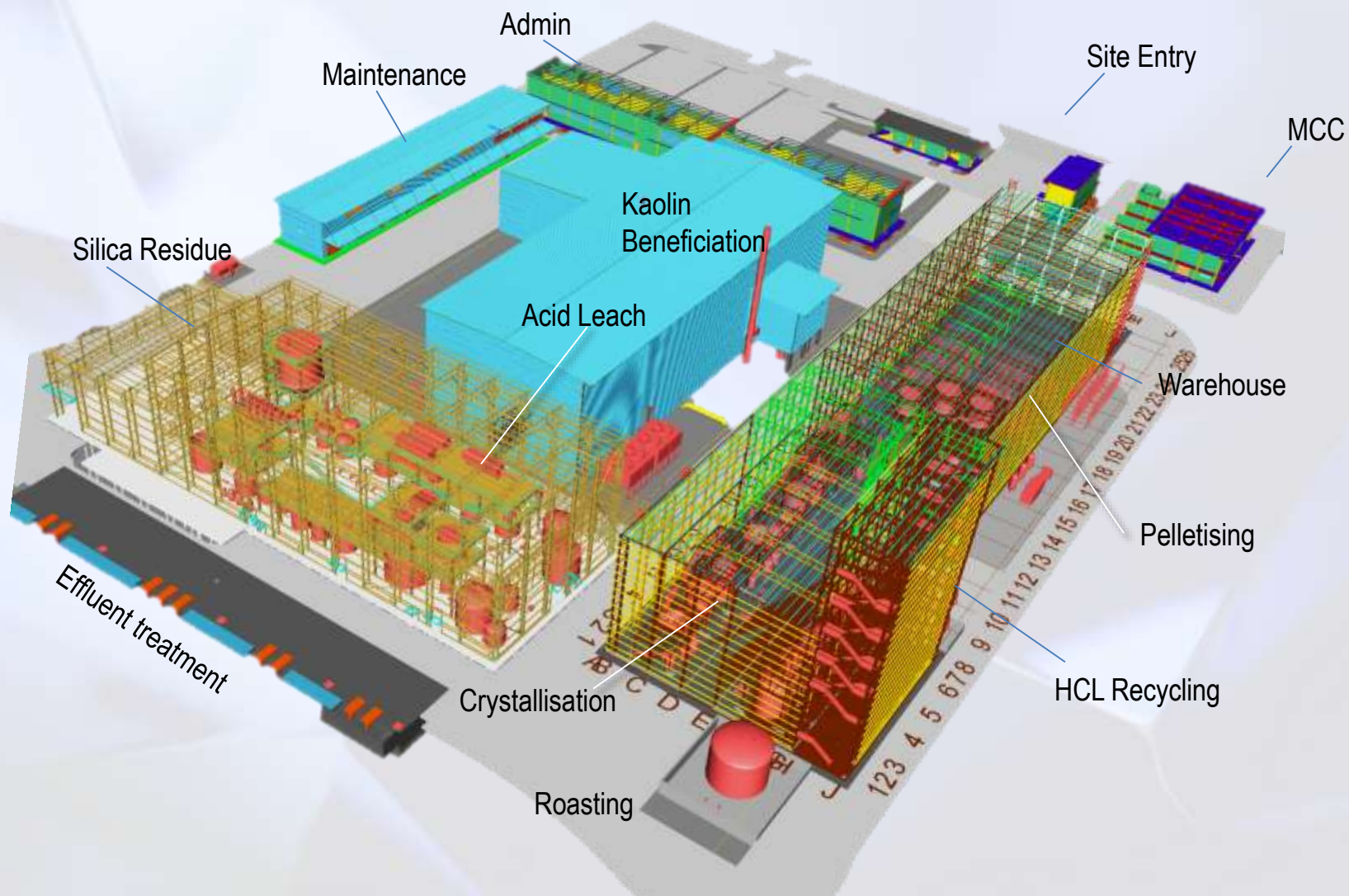
Altech Chemicals
Limited

- Chemical-zoned industrial park (Tanjung Langsat)
- 50-60% lower operating costs
- HCL plant nearby
- Services, natural gas, electricity, water
- Access to 17th largest container port
- Malaysian government incentives
- Environmental approval completed

**HPA Plant to
be in Johor,
Malaysia**



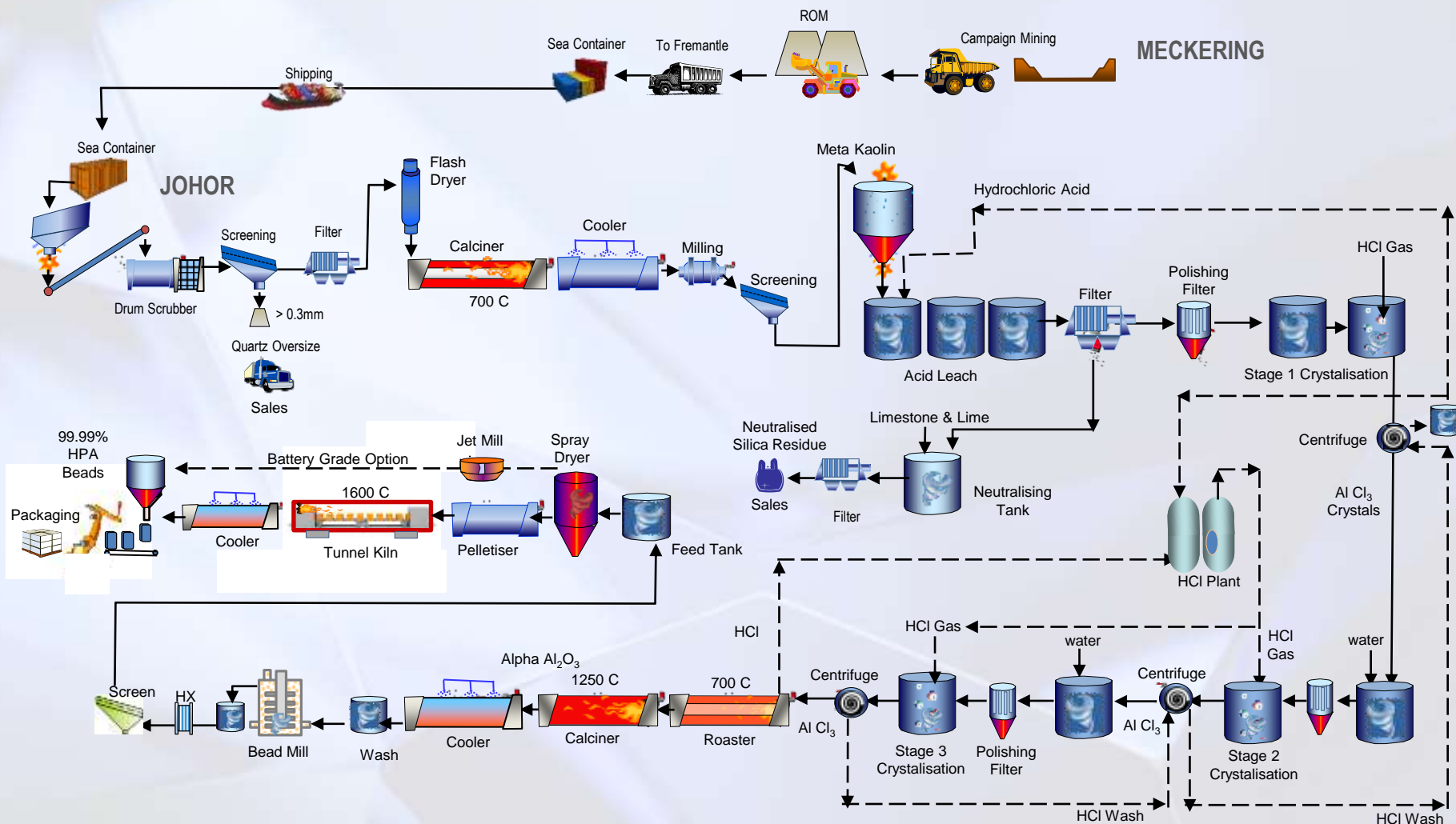
Johor HPA Plant





Altech Chemicals
Limited


Altech's HPA Process





Altech Chemicals
Limited

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

SMS  **group**

**Lump Sum
Turn Key
Contract**





Altech Chemicals
Limited

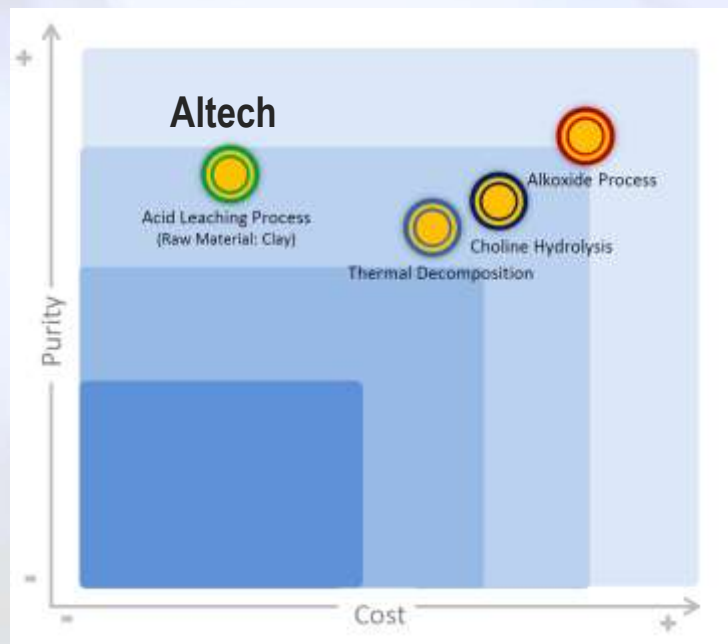
- **Pre-tax NPV_{7.5} US\$ 505 million**
- **Internal Rate of Return (IRR) 22%**
- **Payback (full rate) 3.9 years**
- **EBITDA US\$ 76 million p.a.**
- **Capital cost US\$ 298 million**
- **Production Costs - US\$ 9.90/kg**
- **LT Sale Price - US\$ 26.9/kg**
- **Gross Margin – 63%**

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

- **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**



Altech Chemicals
Limited

- 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
signs
off-take**



mitsubishi

- 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



**Debt
Funding
Successful**

- Final required equity to be finalised
- Possible subordinated mezzanine finance
- Various reserve, contingency, fee requirements
- Possible project level equity participation
- End of Q2-2018 to determine the optimal funding solution
- Maximises shareholder returns and minimises dilution

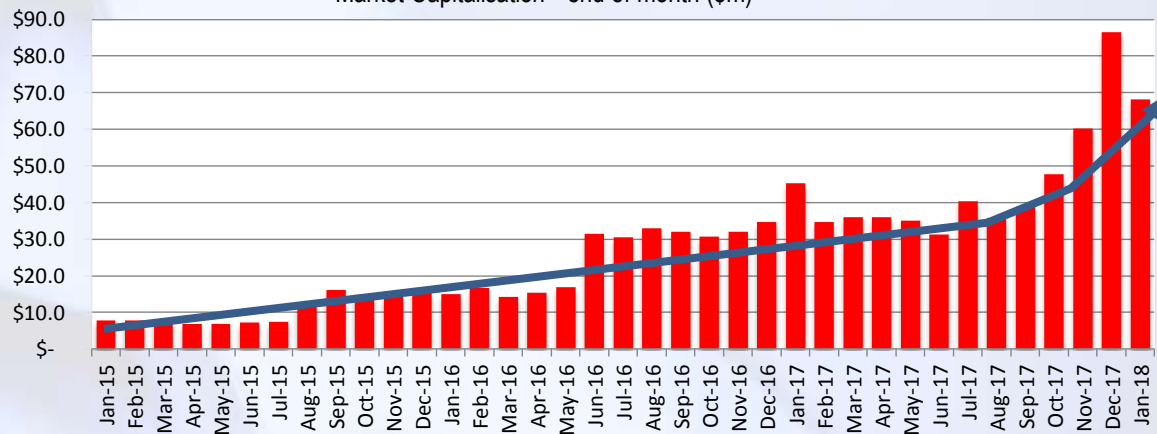


Next Steps Equity Funding



Altech Chemicals
Limited

Altech Chemicals Limited
Market Capitalisation - end of month (\$m)



- 10 x steady market cap growth (3 years)
- Ave trade value \$2k/day to \$350k/day
- 350% increase in shareholders to 2,500
- \$9.3 m cash, no debt
- 426.5 m shares on issue

**Altech
Growth
Performance**

ASX

Board and management team

HIGHLY CREDENTIALLED BOARD HAVING LED SOME OF THE WORLD'S LARGEST ADVANCED MATERIALS OPERATIONS (ALCOA, RIO TINTO)



Mr Luke Atkins

Co-founder and Non-Executive Chairman

- Professional lawyer, with extensive experience in mining, exploration and corporate governance
- Current Non-Executive Director and former Executive Chairman of Bauxite Resources Ltd (ASX: BAU)
- Extensive capital markets experience having held a number of directorships at private and publicly listed companies, including Reclaim Industries Limited



Mr Iggy Tan

Managing Director

- 30 years' experience in the mining and chemicals sectors, with vast experience across project funding, construction, start-up and operations
- Has been involved in the successful commissioning of seven resources projects internationally, including the A\$100m Jiangsu lithium carbonate plant in China
- Previous Managing Director of Nickelore (ASX: NIO), Galaxy Resources (ASX: GXY) and Kogi Iron (ASX: KFE)



Mr Peter Bailey

Non-Executive Director

- Over 40 years' experience as a qualified engineer in the mining and industrial mineral production industries
- Previous president of the Bauxite & Alumina division of Alcoa (NYSE: AA), where he was responsible for Alcoa's eight alumina plants outside of Australia
- Former CEO of Sherwin Alumina



Tunku Yaacob Khyra

Non-Executive Director

- Executive Chairman of Melewar Khyra Group, a Malaysian based diversified financial and industrial services group
- Current Director of Khyra Legacy Berhad and Ithmaar Bank
- Professional accountant and former CEO of Malaysian Assurance Alliance Berhad



Mr Dan Tenardi

Non-Executive Director

- Mining executive with 40 years' industry experience
- Previous Executive of Rio Tinto's Robe River Iron, Managing Director of Bauxite Resources (ASX: BAU) and Chief Operating Manager at CITIC Pacific Mining
- Current Non-Executive Director of Grange Resources Ltd (ASX: GRR)

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.