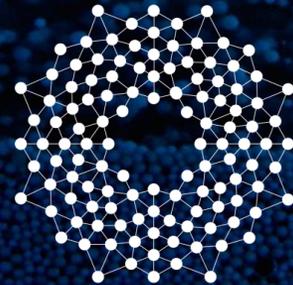




**ULTRA PURE –LOW CARBON  
ALUMINIUM MATERIALS  
SUPPLYING DE-CARBONISATION**



Alpha **HPA**

**ASX: A4N**

## Cautionary Statement

The Definitive Feasibility Study (DFS) referred to in this presentation has been undertaken to assess the technical and financial viability of the HPA First project. The DFS is based on the material assumptions about the availability of funding and the pricing received for HPA. While the Company considers all of the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the outcomes indicated by this DFS will be achieved. To achieve the range of outcomes indicated in the DFS, additional funding will be required. Investors should note that there is no certainty that the Company will be able to raise the amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the HPA First project. If it does, this could materially reduce the Company's proportionate ownership of the HPA First project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the DFS.

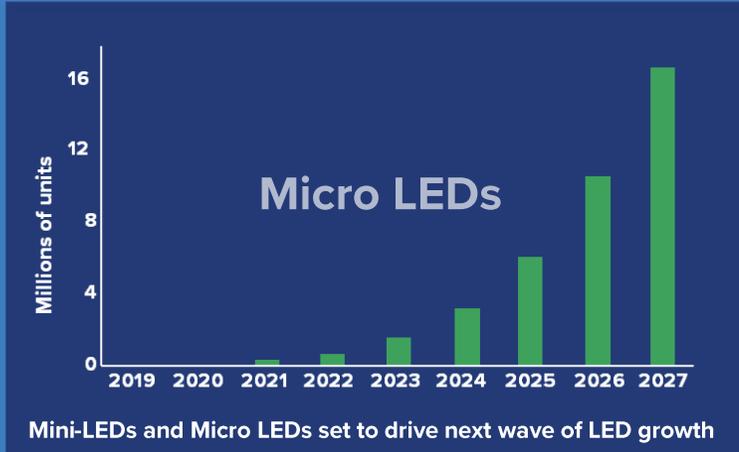
## Forward Looking Statements

This presentation contains certain forward-looking statements with respect to the financial condition, results of operations, and business of the Company and certain plans and objectives of the management of the Company. These forward-looking statements involve known and unknown risks, uncertainties and other factors which are subject to change without notice and may involve significant elements of subjective judgement and assumptions as to future events which may or may not occur. Forward-looking statements are provided as a general guide only and there can be no assurance that actual outcomes will not differ materially from these statements. Neither the Company, nor any other person, give any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur. In particular, those forward-looking statements are subject to significant uncertainties and contingencies, many of which are outside the control of the Company. A number of important factors could cause actual results or performance to differ materially from the forward looking statements. Investors should consider the forward looking statements contained in this DFS in light of those disclosures.

This presentation is for information purposes only. Neither this presentation nor the information contained in it constitutes an offer, invitation, solicitation or recommendation in relation to the purchase or sales of shares in any jurisdiction. The presentation may not be distributed in any jurisdiction except in accordance with the legal requirements applicable in such jurisdiction. Recipients should inform themselves of the restrictions that apply to their own jurisdiction as a failure to do so may result in a violation of securities laws in such jurisdiction. This presentation does not constitute investment advice and has been prepared without considering the recipients investment objectives, financial circumstances or particular needs and the opinions and recommendations in this presentation are not intended to represent recommendations of particular investments to particular persons. Recipients should seek professional advice when deciding if an investment is appropriate. All securities' transactions involve risks, which include (among others) the risk of adverse or unanticipated market, financial or political developments. To the fullest extent of the law, Alpha HPA Limited, its officers, employees, agents and advisors do not make any representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of any information, statements, opinion, estimates, forecasts or other representations contained in this presentation. No responsibility for any errors or omissions from the announcement arising out of negligence or otherwise is accepted.

# LED-LIGHTING

## The current technology driver of de-carbonisation



LEDs reduced CO<sub>2</sub>e by an est. 570m tons in 2017

Reducing new power stations by 1,250

IN 2017, THE USE OF LEDS TO ILLUMINATE BUILDINGS AND OUTDOOR SPACES REDUCED CO<sub>2</sub> EMISSIONS BY NEARLY

**570** MILLION TONNES

**75%**

PROJECTED ENERGY SAVINGS IN US LIGHT ENERGY CONSUMPTION BY 2035

LED lights are 50-70% more efficient than incandescent

**A COMPLETE SWITCH TO LED LIGHTING WORLD WIDE, WOULD PREVENT 1,400,000,000 TONNES OF CO<sub>2</sub> EMISSIONS**

ANNUAL CO<sub>2</sub> EMISSIONS SAVINGS FROM GLOBAL LED ADOPTION BY 2035

EQUIVALENT TO 200 MILLION CARS

OR 200 NEW COAL FIRED POWER STATIONS

**WE SUPPLY**

- HPA for LED sapphire substrates
- HPA for LED phosphors
- Al-precursors for LED phosphors

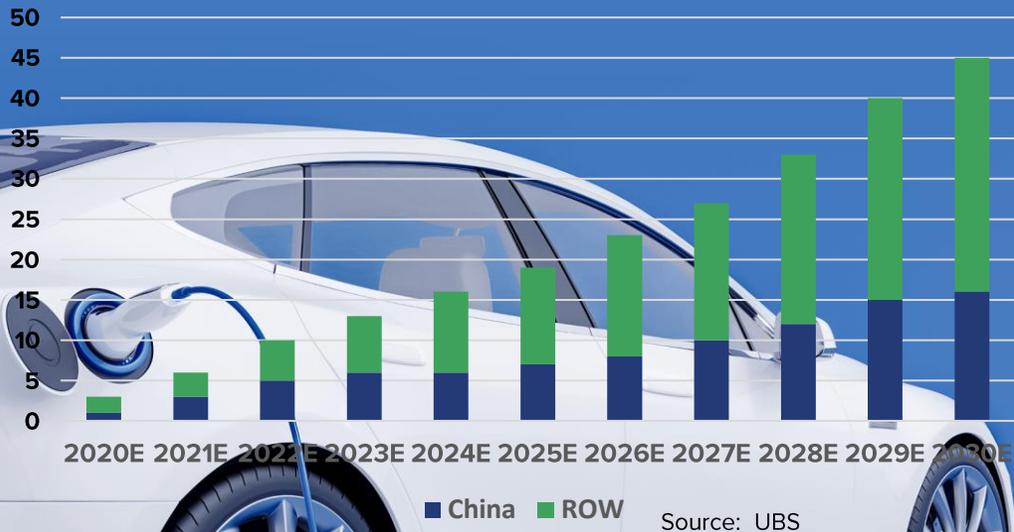
Alpha HPA

Sources: US Dept of Energy, www.microled-info.com & IHS Markits

# E-MOBILITY

## The next major driver of de-carbonisation

EV Sales Forecast (M units)



### Gasoline Only



### Average Emissions

**380**

Grams of CO<sub>2</sub>e per mile

### Plug-in Hybrid Electric



**209**

Grams of CO<sub>2</sub>e per mile

### Battery Electric



**154**

Grams of CO<sub>2</sub>e per mile

Source: Inside EV's ([www.insideeVs.com](http://www.insideeVs.com))

## CO<sub>2</sub> Emissions

50%



## WE SUPPLY

- ✓ HPA for separators
- ✓ Al-precursors for cathode
- ✓ Al-precursors for anode



Alpha HPA

# Alpha HPA: Introduction

We are a technology/industrial chemical company

We make **ultra-high purity aluminium products** with a  
worlds first process which are:

**CRITICAL RAW MATERIALS FOR DE-CARBONISATION**

Our proprietary process delivers us the competitive edge

**HIGH PURITY/LOW CAPEX/LOW OPEX/LOW CARBON**

We are commercialising in 2 Stages as the  
**HPA FIRST PROJECT**

**STAGE 1 CONSTRUCTION UNDERWAY**

**Stage 1 PPF – Commissioning Sept 2022**

**Stage 2 Full Scale HPA First Project** - to free cash flows of  
between **A\$133 - \$280M pa** (DFS - March 2020)



**STAGE 1 - CONSTRUCTION UNDERWAY  
A\$60M IN AUST GOVT GRANTS APPROVED**

- 10ha project site secured
- Stage 1 Construction underway – Completion September 2022
- Adjacent to Orica Australia to allow for Project Interface
- Definitive Orica Agreements executed



**HPA First Project Site  
Gladstone State Development Area,  
North Queensland**

**HPA First Project: Location**





**Stage 1 : Commissioning late Sept 2022**





**Stage 1 : Commissioning late Sept 2022**

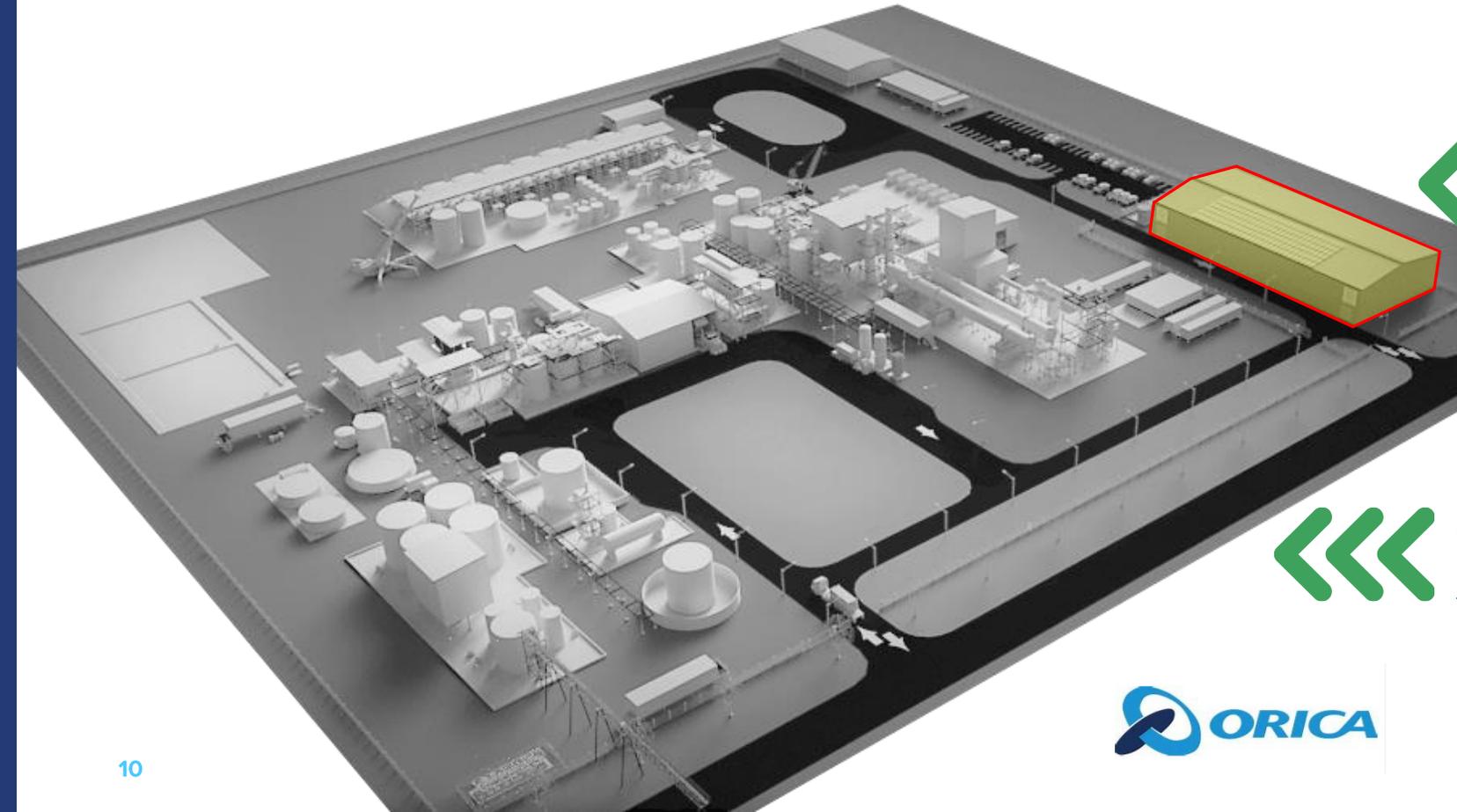


# Project Layout:

## Stage 1: Under Construction

## Stage 2: Full Scale Facility

- Stage 1 under construction within the HPA First Project Footprint
- Stage 1 to be incorporated into the full scale HPA First Plant as a dedicated unit for 5N Al-Sulfate.
- [alphahpa.com.au/our-projects](http://alphahpa.com.au/our-projects)



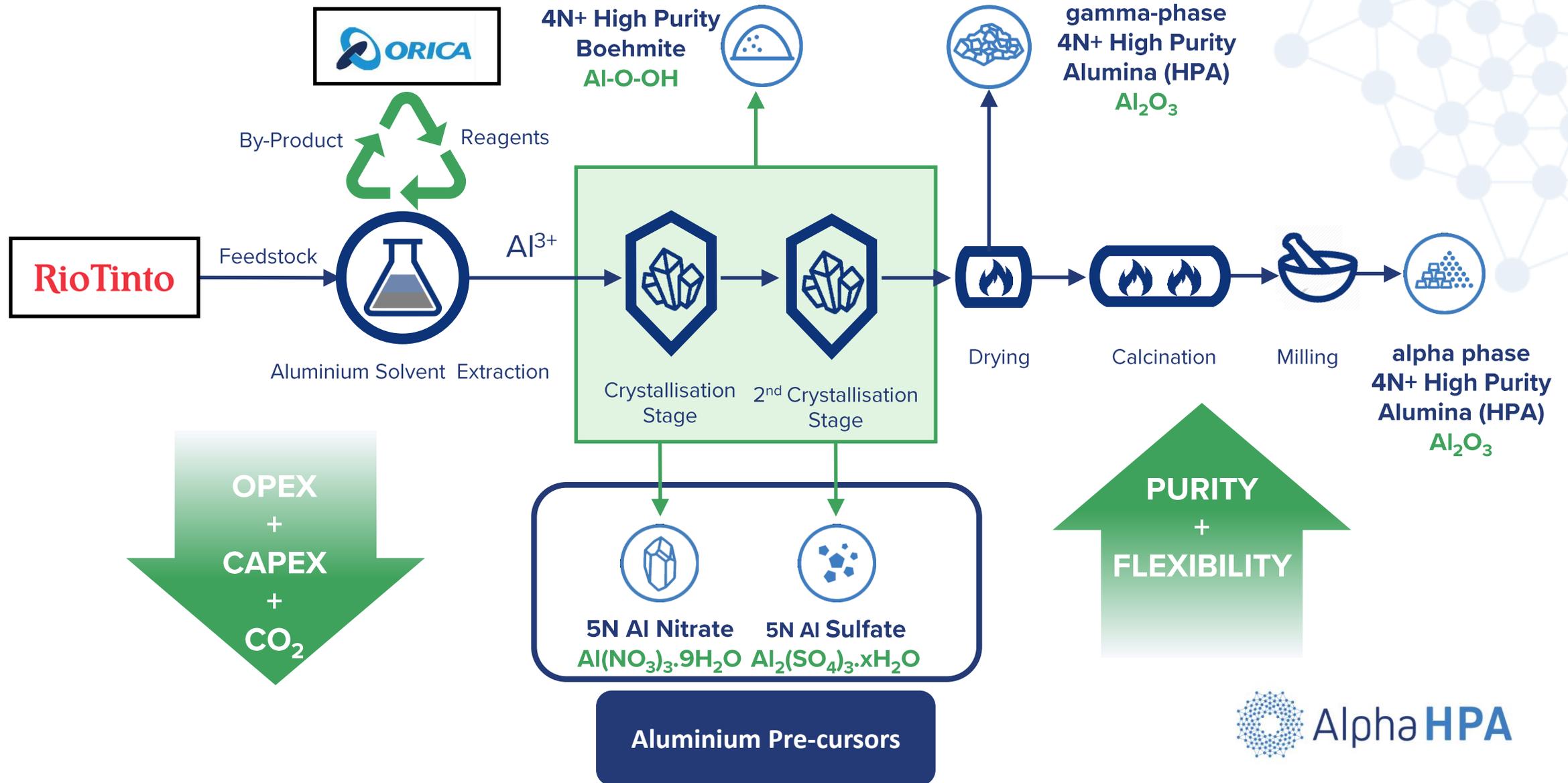
**\$35M Stage 1 - Under Construction**  
**Additional \$15.5M Aust Govt Grant**



**Stage 2 – Full-scale facility on same site**  
**\$45M Aust Govt Grant**



# Process Flow Sheet: World First + Disruptive



# Our Customers and Partners:

- Existing customers, marketing agents and key business partnerships



# Our products:

## High Purity Aluminas



### Ultra High Purity Alumina (HPA) Powder & Tablets

>99.995% (4N5) purity HPA engineered to suit customers specifications such as bespoke particle sized powders, sintered and un-sintered granules and sintered custom tablets.



### Ultra High Purity Boehmite

A bespoke engineered >99.995% (4N5) purity Boehmite to suit specific customer requirements, ideal for sol-gel applications in the battery, semi-conductor and medical sectors.



### Ultra Aluminium Nitrate

Our >99.999% (5N) purity aluminium nitrate is the purest product available at commercial scale. Key applications in Li-B particle coating, LED nano-phosphors, aluminate scintillators and other specialty products.



### Ultra Aluminium Sulfate

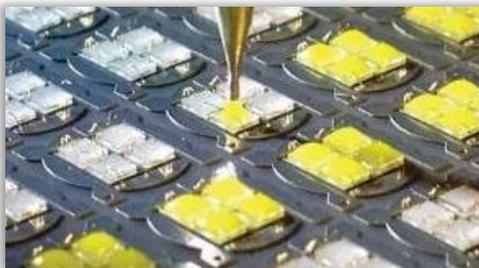
Our >99.999% (5N) aluminium sulfate is the purest product available at commercial scale. A premium product for synthesis of aluminium cathode active materials (CAM) with NCA, NCMA and NFA.

# Our products for LED lights

## LED PHOSPHORS

Synthesis of Aluminate (YAG) Phosphors for white LEDs

**HPA**  
+  
**5N Al-Nitrate**



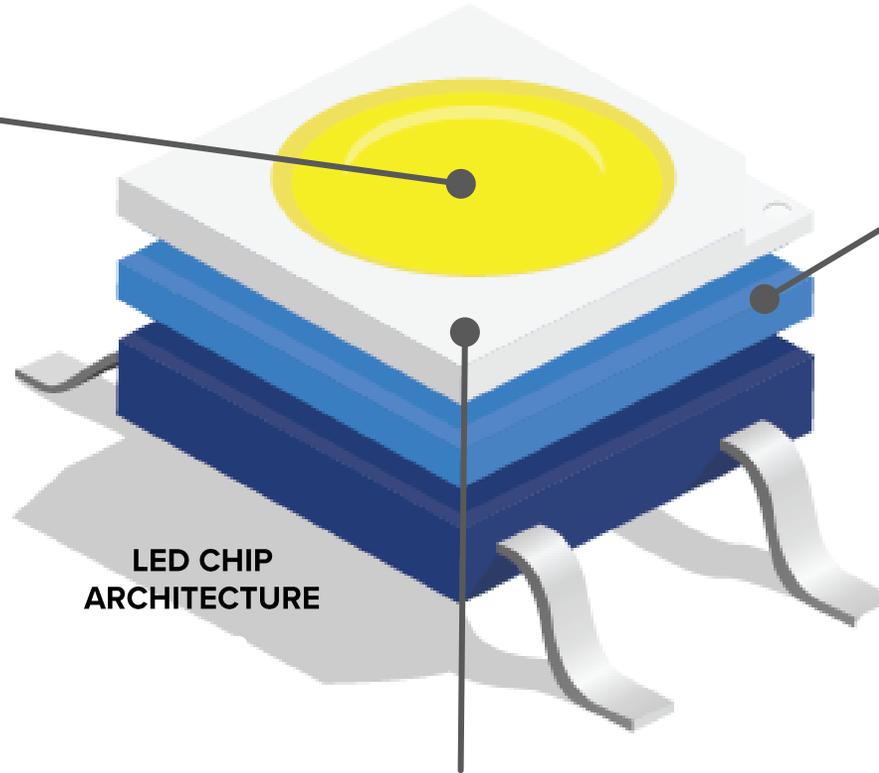
Addition of YAG phosphors to LED lighting circuits

**QUALIFIED WITH EU BASED LED PHOSPHOR OEM**

## SAPPHIRE GLASS WAFERS

Sapphire crystal growth cut to sapphire wafer

**HPA Pellets**



**LED CHIP ARCHITECTURE**

Ga-N circuit & Active Layers



Addition of YAG phosphors to LED lighting circuits

**QUALIFIED WITH US BASED SAPPHIRE GROWER**



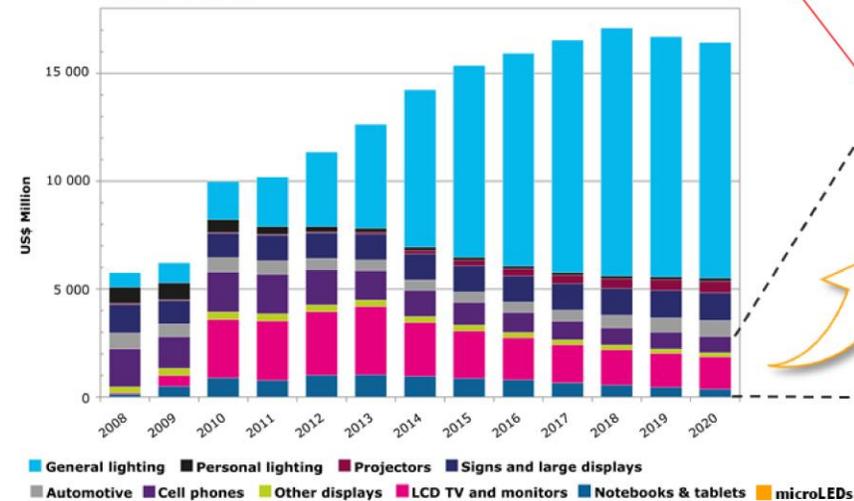
# Micro LEDs: The LED market multiplier

- Adoption of micro-LEDs has the potential to double existing LED market
- Micro LEDs require nano-size phosphors
- Nano-size phosphors increasingly require 'wet process' synthesis >> using Al-nitrate

## MicroLED Market

MicroLEDs set to double the size of the entire LED market: +17 Billion USD by 2025\*

Source: MarketWatch, Inc.



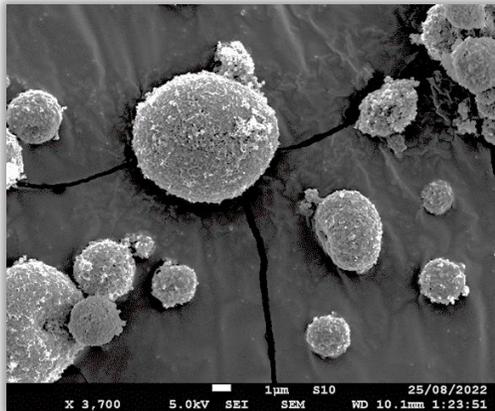
- Apple LuxVue (Acquired)
- Facebook mLED, InfiniLED, Plessey (Acquired)
- Intel Aledia (Equity Invest.)
- Google g1o (Equity Invest.)

# Our products for the lithium-ion cell

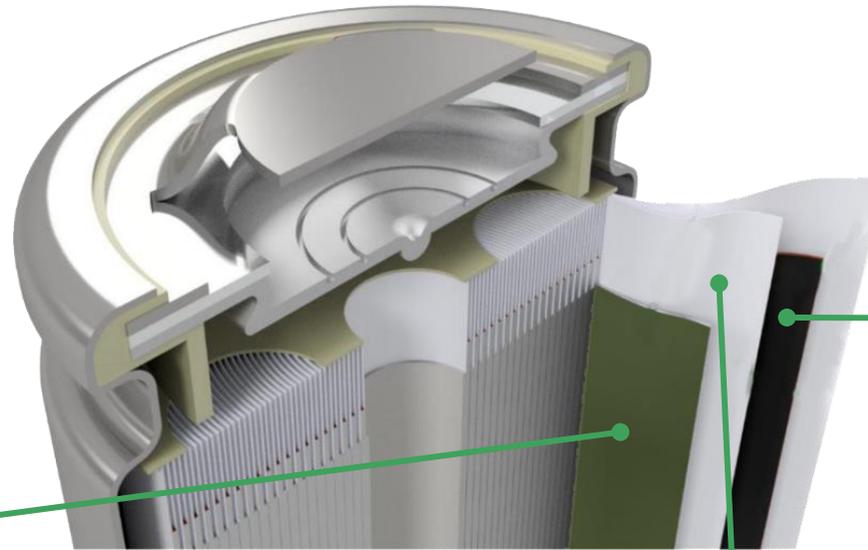
## CATHODE

Cathode pre-cursors for  
NCA & NCMA and  
alumina coating

**5N Al-Nitrate**  
+  
**5N Al-Sulfate**



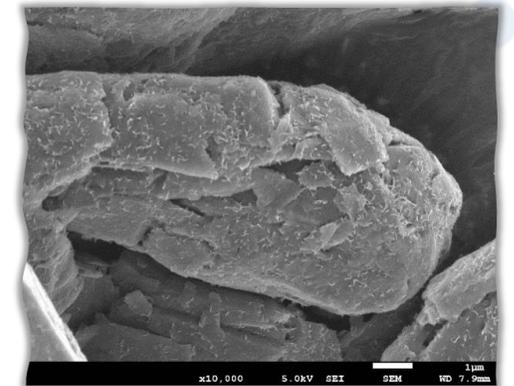
*Boehmite coated cathode particles  
from Alpha's Al-Nitrates*



## ANODE

Pre-cursors for coating  
graphite and silicon  
anode

**5N Al-Nitrate**

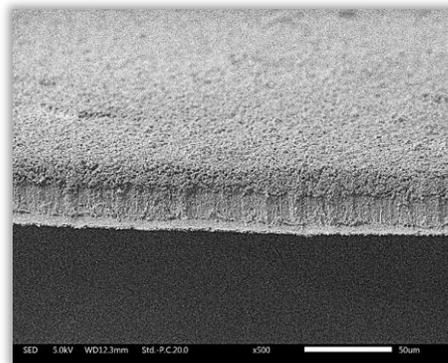


*Boehmite coated anode particles  
from Alpha's Al-Nitrates*

## SEPARATOR

Ceramic coating for  
thermal management

**HPA &  
High Purity  
Boehmite**



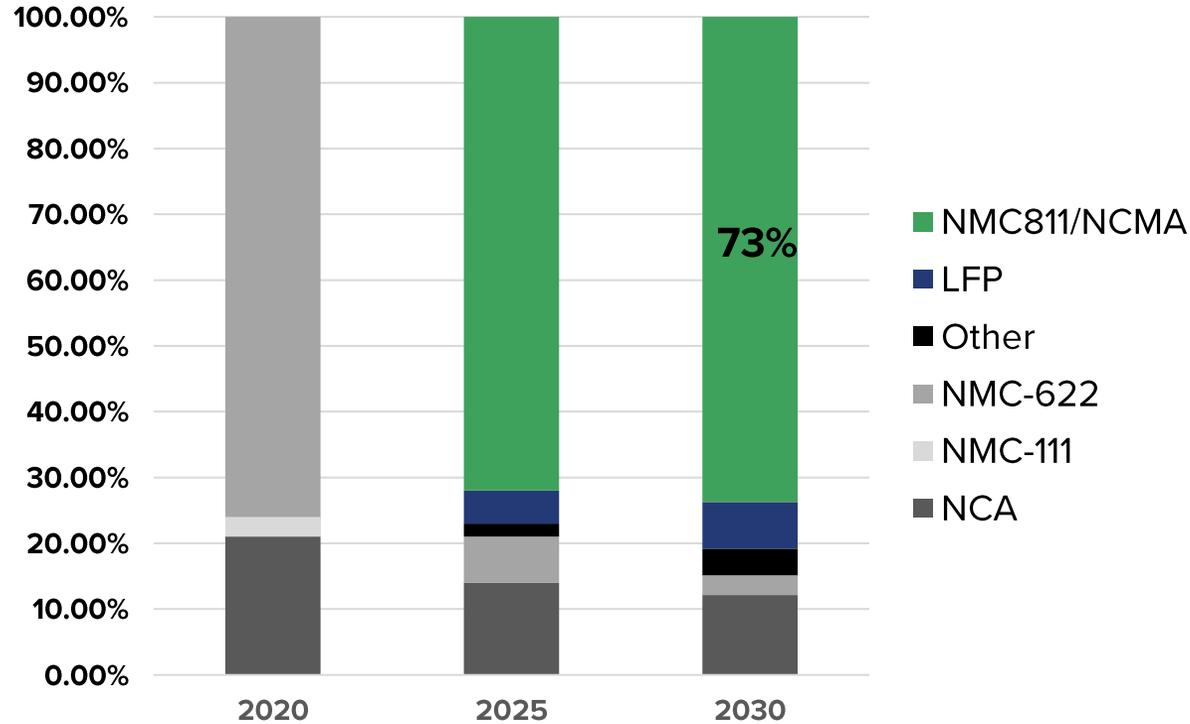
*Alpha's HPA coating  
Li-B separator separator  
(courtesy FBICRC)*



# 5N Aluminium Precursors: Solving High Nickel Cathodes

## The Rise of High Nickel Cathodes

= increasing aluminium precursor demand

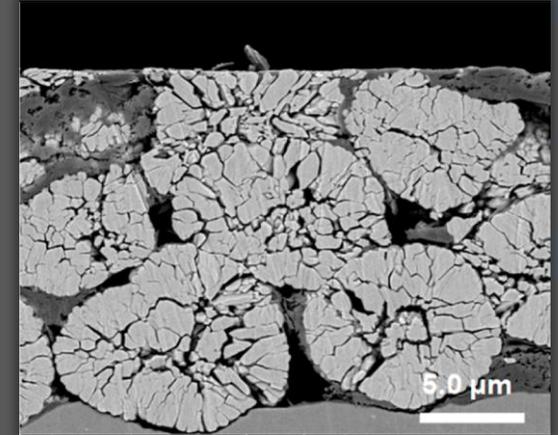


Auto Market (GWh/a)	2020	2025	2030
	53	243	820

Source: UBS – July 2021

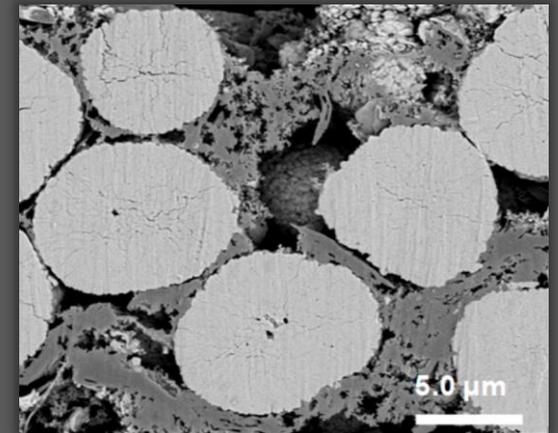
- High nickel cathodes to dominate by 2025
- Cathode instability solved by Alumina coating and/or Al doping
- eg: NCMA cathode – GM/Ultium

Untreated High Nickel (+80%) Cathode is unstable



Breakdown of high nickel (NCM811) cathodes after 1,000 cycles  
Source: Kim et al, ACS Energy 2019

Aluminium doped High Nickel (+80%) Cathode is stable



Al doped high nickel (NCMA811) cathodes after 1,000 cycles  
Source: Kim et al, ACS Energy 2019

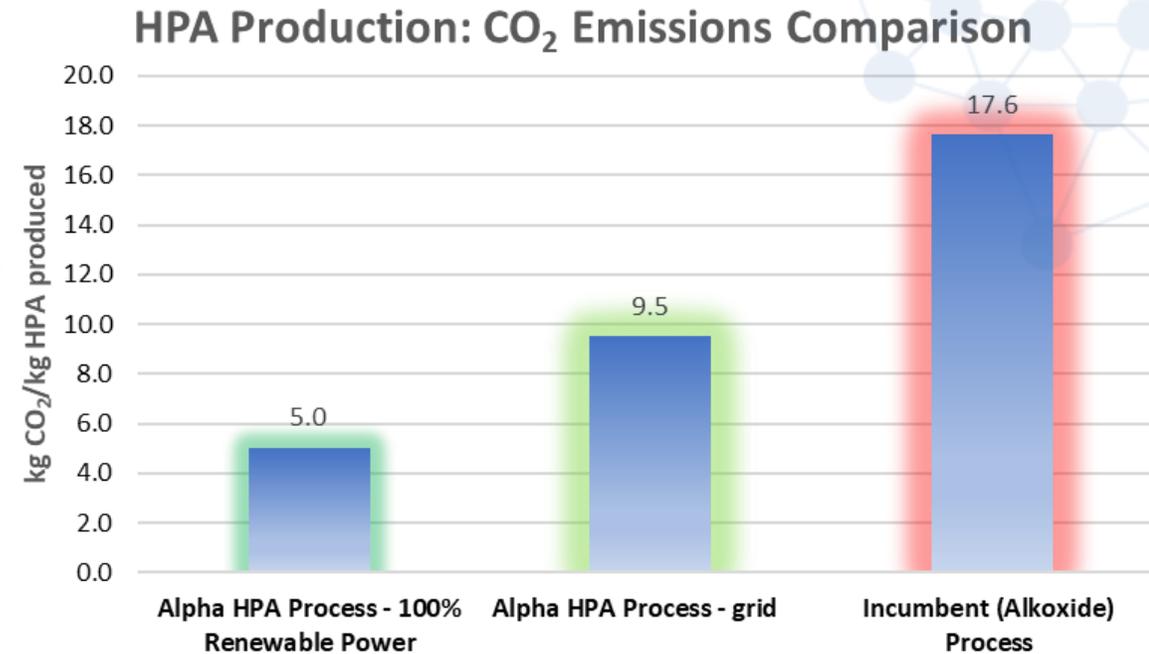
# CO<sub>2</sub> Emissions Summary

~70% lower total emissions in feedstock and production process combined compared to the incumbent process

## EMISSIONS REDUCTIONS

1. We do not use Al metal as feedstock
2. We recycle our reagents
3. We use 100% renewable energy

~70% lower total CO<sub>2</sub> emissions



# HPA First Project: Brisbane Plant >>>



Crystalliser



Pre-Cursor Room



Pelleting Room

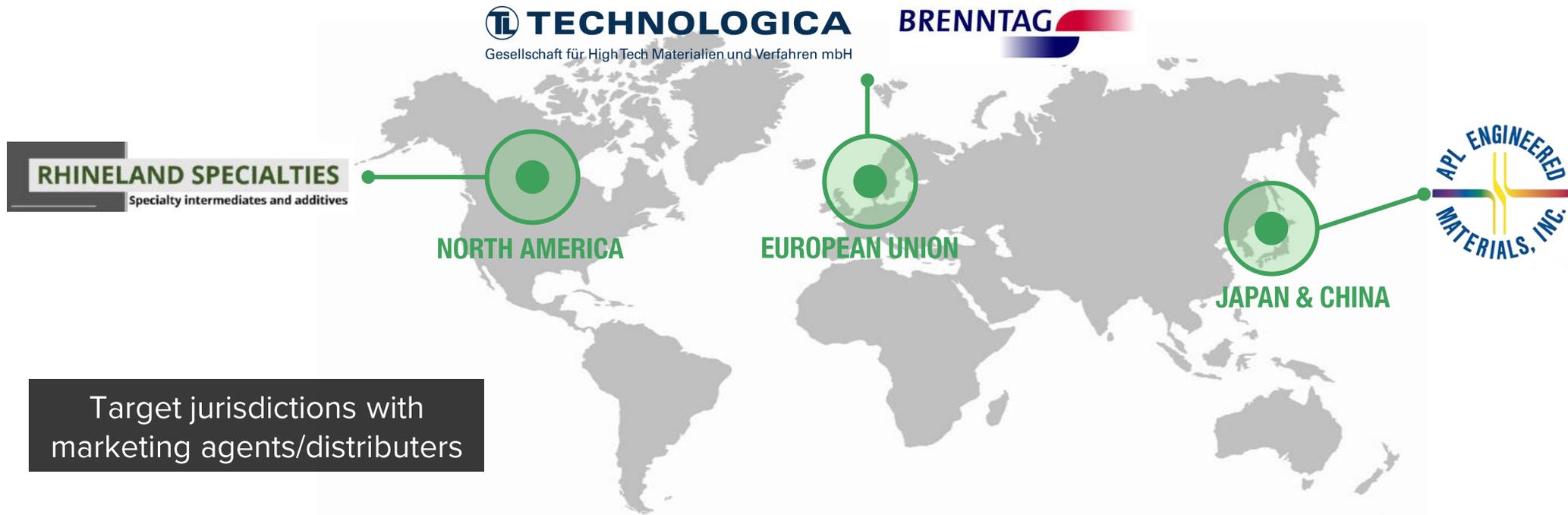


Solvent Extraction

- Continuously operating facility, with over 7,000 operating hours
- Aluminium nitrate production to date >5,100kg
- Servicing specialty sales and continued product test orders

# HPA First Project: Global Product Marketing

- Global marketing network established
- >100 product samples now distributed globally to >40 end users
- Products qualified for sapphire glass, LED phosphors and separator coatings
- Al-nitrate and HPA sales commenced
- Multiple (16) bids submitted for high value supply contracts
- A further +30 separate end users testing/qualifying multiple products



# HPA First Project: Highlights and Catalysts

DFS

Mar '20 Definitive Feasibility Study – ROBUST PROJECT CONFIRMED



Sept '20: 2 x High-purity Li-B Pre-Cursor manufacture confirmed



Feb '21: Major Project Permitting Approval (MCU)



Apr '21: MOU with Saint Gobain – all products



May '21: MOU with CleanCo QLD to provide up to 100% Renewable Energy



Aug '21: Orica Definitive Agreements



Sep '21: NAIF – Strategic Assessment Phase Approval



Nov '21: Project Site Secured – PPF CONSTRUCTION COMMENCED



Mar '22: Approval of \$45M Federal Government Grant for Stage 2



Apr '22: Approval of \$15.5M Federal Government Grant for Stage 1



Sept '22: MOU with Brenntag – Worlds largest chemical distributor



Current: Global Outreach >100 end-user test products shipped, 16 supply bids submitted.

Sept '22: COMMISSIONING – STAGE 1

Pending: Large Volume Product Offtakes

Pending: Final Product Mix and DFS Update

Pending: Project Financing and FID



# Corporate Snapshot

## TRADING INFORMATION

ASX CODE	A4N
Share Price (02/09/2022)	~50c
52-week trading range	37.5c – 70c
Issued Shares	812.36M

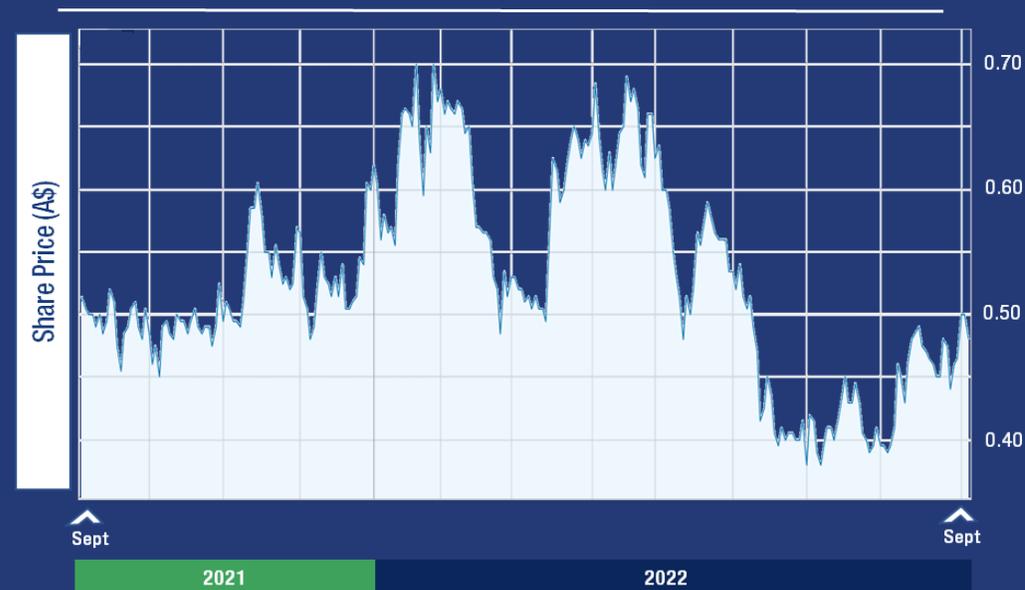
## CAPITAL STRUCTURE

Issued Shares	812.36M
Unlisted options (@35c)*	5.0M (expire 30 Sept 2023)
Unlisted options (@35c)	26.0M (expire 31 July 2023)
Unlisted options (@90c)	11.4M (expire 30 April 2025)

Market Cap	\$406M
Est Cash (31-08-2022)	~\$12.6M – No Debt
Enterprise Value	\$393.4M

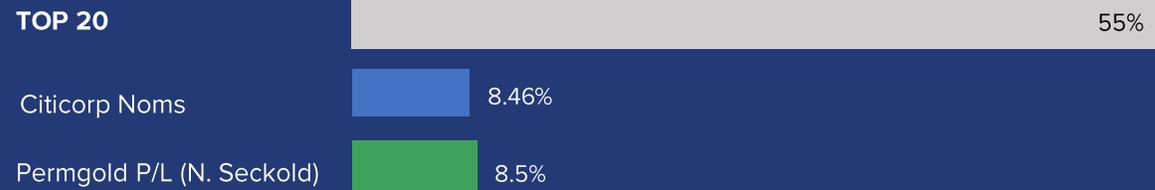
\* Licensor Options

## SHARE PRICE PERFORMANCE – 12 MONTHS



## SHAREHOLDERS

### TOP 20



# Contact

**Rimas Kairaitis**  
Managing Director

[rkairaitis@alphahpa.com.au](mailto:rkairaitis@alphahpa.com.au)

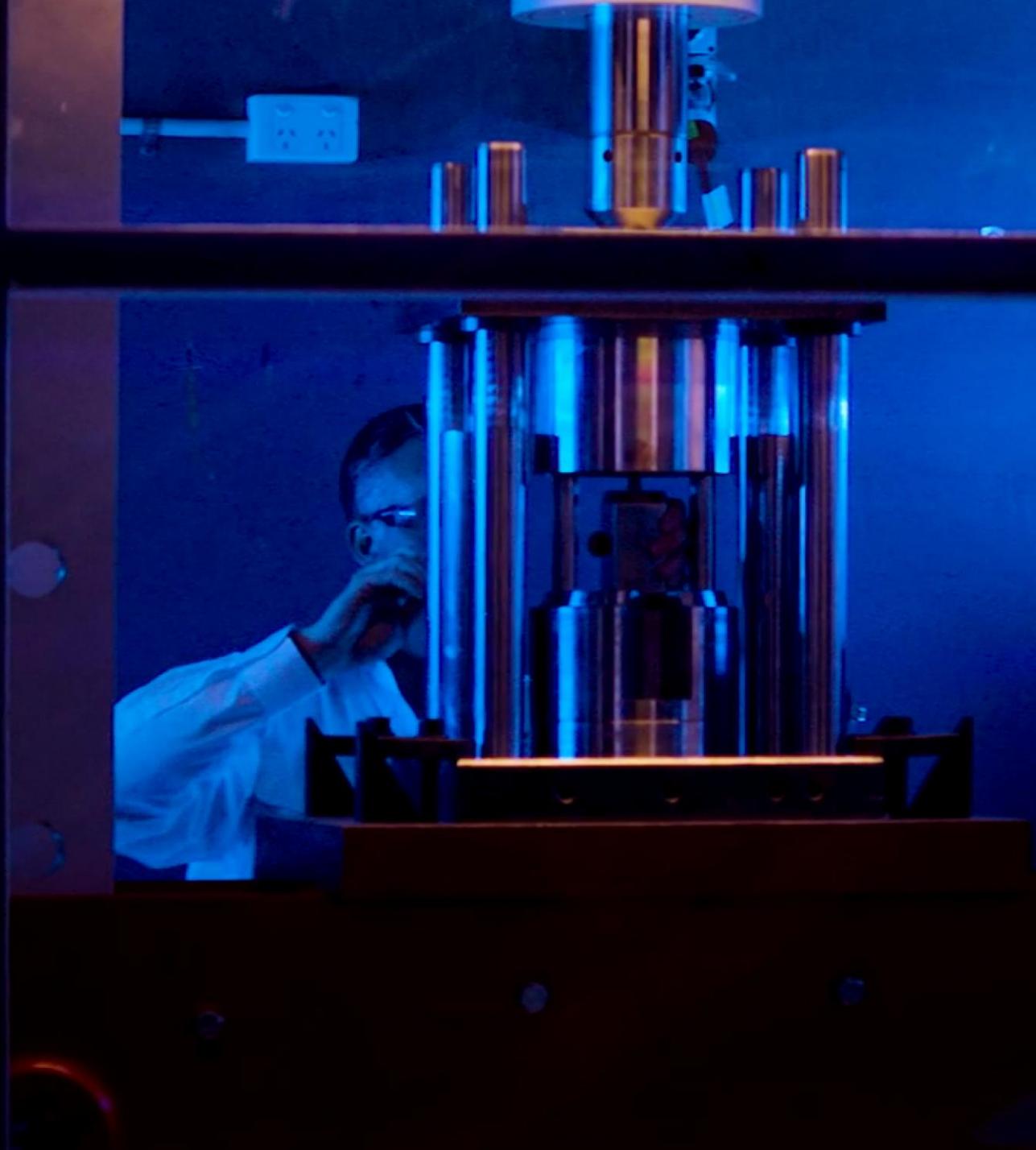
+61 408 414 474

**Cameron Peacock**  
Investor Relations and Business Development

[cpeacock@alphahpa.com.au](mailto:cpeacock@alphahpa.com.au)

+61 439 908 732

[alphahpa.com.au](http://alphahpa.com.au)





**THANK YOU**



Alpha HPA