Speculative
See key risks on page 8.
Speculative securities may not be suitable for Retail clients

21 May 2020

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Alpha HPA Ltd (A4N)

Initiation: Leverage to new energy

Recommendation
Buy (Initiation)
Price
$0.165
Valuation
$0.36 (previously not rated)
Risk
Speculative

GICS Sector

Materials

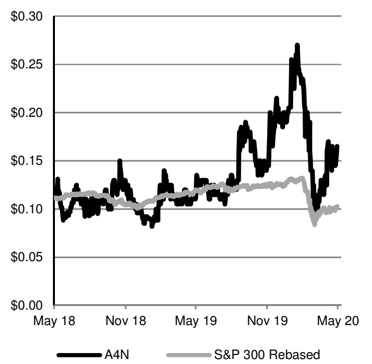
Expected Return	
Capital growth	118%
Dividend yield	0%
Total expected return	118%

Company Data & Ratios	
Enterprise value	$102m
Market cap	$104m
Issued capital	632m
Free float	85%
Avg. daily val. (52wk)	$190,351
12 month price range	$0.086-$0.275

Price Performance

	(1m)	(3m)	(12m)
Price (A$)	0.12	0.24	0.12
Absolute (%)	43.48	-31.25	43.48
Rel market (%)	40.26	-9.82	55.20

Absolute Price



SOURCE: IRESS

Disruptive approach high-value mineral production

A4N's HPA First Project is aiming to supply high-purity alumina (HPA) at a purity of greater than 99.99% (or 4N) to the lithium ion battery and light emitting diode (LED) manufacturing sectors. The project's proprietary technology is expected to disrupt incumbent HPA production through significantly lower unit costs. Results of a definitive feasibility study (DFS) announced in March 2020 outlined a 10,000tpa 4N HPA project with a capital cost of $308m and pre-tax annual cash flow of $133-280m at 4N HPA prices ranging US$15,000-25,000/t (prices are currently around $24,000/t).

Orica & A4N moving to a definitive long-term partnership

HPA First is a solvent extraction process using an aluminium chemical feedstock purchased on globally traded markets. Orica Ltd (ORI) and A4N are advancing a definitive agreement for ORI's supply of process reagents and for by-product offtake. This agreement has required significant third party due diligence of the HPA First process. A 20-year partnership between A4N and ORI is being considered.

4N HPA market expected to grow at +17%pa to 2028

Commodity market consultants CRU Group conservatively estimate that the current 4N HPA market is around 30ktpa and expect the growth in lithium ion battery applications will see demand grow by over 17% to around 100ktpa by 2028. CRU assert that traditional routes of HPA production will struggle to meet this 4N HPA demand growth, leading to increasing market deficits. The ramp-up of A4N's HPA First Project in 2023 will supply into these market deficits and the expected strength in 4N HPA prices.

Investment thesis: Speculative Buy, Valuation $0.36/sh

Our Buy, Speculative recommendation is supported by the potential for A4N's HPA First Project to generate significant free cash flow through supplying 4N HPA to the high-growth lithium ion battery and LED manufacturing sectors. The HPA First technology has passed rigorous due diligence by third party technical consultants and through the partnering process with ORI. A4N provides value leverage to the up-take of electric vehicles and renewable energy lithium ion battery applications.

Our A4N risked and diluted valuation is $0.36/sh. A4N is currently a development company with prospective operations and cash flows only. Our Speculative risk rating recognises this higher level of risk and volatility of returns.

Earnings Forecast

Year ending 30 June	2021e	2022e	2023e	2024e
Sales (A$m)	-	-	57	197
EBITDA (A$m)	(2)	(2)	27	123
NPAT (reported) (A$m)	(2)	(16)	(1)	67
NPAT (adjusted) (A$m)	(2)	(16)	(1)	67
EPS (adjusted) (¢ps)	(0.2)	(1.3)	(0.1)	5.6
EPS growth (%)	na	na	na	na
PER (x)	-74.7x	-12.3x	-295.2x	2.9x
FCF Yield (%)	-71%	-118%	-5%	22%
EV/EBITDA (x)	-50.9x	-50.9x	3.8x	0.8x
Dividend (¢ps)	-	-	-	3.0
Yield (%)	0%	0%	0%	18%
Franking (%)	-	-	-	-
ROE (%)	-2%	-10%	0%	42%

SOURCE: BELL POTTER SECURITIES ESTIMATES

Contents

1. Investment thesis & recommendation

Investment thesis

- A4N has the potential to be a low cost supplier of HPA into the lithium ion battery and LED manufacturing sector. This sector is leveraged to the take-up of electric vehicles and other solutions which are expected to disrupt the traditional automotive, electricity generation and energy distribution sectors.
- A4N's HPA First Project's March 2020 DFS outlined a project producing 10,000tpa 4N HPA at unit cash operating costs of $8,730/t (US$5,940/t). DFS HPA price scenarios ranged US$15,000-25,000/t, resulting in annual pre-tax cash flow of US$133-280m. The DFS timeline estimates that HPA production could commence by the end of 2022.
- The global 4N+ HPA market (i.e. HPA with purity of 99.99% or more) was around 20kt in 2018, has grown to around 30ktpa now and is expected to grow at a rate of more than 17% to 2028, or to around 100ktpa (CRU Group). A4N's HPA First Project is designed to produce 10ktpa 4N HPA, ramping up in 2023 into what is expected to be a supply deficit market. Current prices for 4N HPA are around US$24,000/t.
- The HPA First Project employs a proprietary solvent extraction route of HPA production which operates mostly at ambient temperatures and pressures and has raw material and reagent inputs readily available on international chemical markets. The process also produces saleable by-products. HPA First is less energy intensive than traditional HPA production methods, has lower operational risk and is expected to have substantially lower unit costs.
- A4N has signed a Memorandum of Understanding (MoU) with major ASX-listed chemicals group Orica Ltd (ORI), to progress to a definitive Supply and Offtake Agreement. Under the proposed agreement ORI will supply key reagent inputs for the HPA First Project and purchase by-products from the process over an indicative 20-year term. The MoU follows, and includes ongoing, technical due diligence on the HPA First process. A4N has also secured land within the Gladstone State Development Area (Queensland), proximal to the agreed points of delivery with ORI.

Recommendation: Buy, Speculative - Valuation $0.36/sh

Our Buy, Speculative recommendation is supported by the potential for A4N's HPA First Project to generate significant free cash flow through supplying 4N HPA to the high-growth lithium ion battery manufacturing sector. The HPA First technology has passed rigorous due diligence by third party technical consultants and through the partnering process with ORI. A4N provides value leverage to the electric vehicle and renewable energy sectors.

Our A4N risked and diluted valuation is $0.36/sh. A4N is currently a development company with prospective operations and cash flows only. Our Speculative risk rating recognises this higher level of risk and volatility of returns.

Near term news flow & value catalysts

- Agreement and completion of a definitive and binding Supply and Offtake Agreement with ORI (exclusivity ends on 31 July 2020) or another suitable chemical company counterparty.
- Commencement of detailed post-DFS front-end engineering design (FEED) in preparation for engineering, procurement, construction management (EPCM) tendering.

- Environmental and other statutory permitting approvals for the construction of the HPA First Project facility and the required connecting pipeline infrastructure to the chemical counterparty.
- Ongoing discussions and potential signing of offtake agreements with end-users in the lithium ion battery and LED light manufacturing sectors.

Short term capital requirements

- At 31 March 2020, A4N had cash of $2.5m and no debt.
- The capital intensive stage of the HPA First Project DFS is now largely complete. As such, we expect that the next major capital requirement for A4N will be associated with financing of the HPA First Project.
- A4N's administration costs are on average less than $0.5m each quarter.
- A4N is likely to receive further Australian R&D Tax Incentive rebates in the near term.
- There are 12m, 15c/sh options ($1.8m total) expiring on 31 October 2020.
- We have conservatively assumed that A4N raise an additional $5m in equity before the end of 2020. However, we expect that this raising will be completed after a definitive agreement with ORI has been announced.

Table 1 - Quarterly cash flow summary

Quarter ending	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20
Development	-568	-711	-681	-604	-263	-774	-1,216	-1,201	-1,908
Staff, admininstration & corporate	-412	-323	-398	-267	-400	-551	-598	-479	-586
R&D refunds	0	0	0	0	0	0	234	684	0
Other operating	-207	-59	14	11	8	5	106	106	6
Total operating cash flows	**-1,187**	**-1,093**	**-1,065**	**-860**	**-655**	**-1,320**	**-1,474**	**-890**	**-2,488**
Total investing cash flows	**0**	**0**	**50**	**100**	**0**	**0**	**0**	**0**	**0**
Proceeds from shares net of costs	0	0	3,927	-17	0	0	4,424	2,076	0
Other financing cash flows	18	0	83	99	35	28	40	39	37
Total financing cash flows	**18**	**0**	**4,010**	**82**	**35**	**28**	**4,464**	**2,115**	**37**
Beginning cash balance	2,615	1,446	353	3,348	2,670	2,050	758	3,748	4,973
Total change in cash	-1,169	-1,093	2,995	-678	-620	-1,292	2,990	1,225	-2,451
Ending cash balance	**1,446**	**353**	**3,348**	**2,670**	**2,050**	**758**	**3,748**	**4,973**	**2,522**

SOURCE: COMPANY DATA AND BELL POTTER SECURITIES ESTIMATES

Financing the HPA First Project

A4N are considering a number of options with respect to financing the pre-production DFS capital cost of $308m. A4N has engaged Brisbane-based KPMG Debt Advisory Team to coordinate the project financing process for the HPA First Project.

We expect that the ultimate funding structure will be dependent upon the final structure of the definitive Supply and Offtake Agreement with ORI. Potential funding sources currently being considered include, but are not limited to:

- Strategic funding from product offtake counterparties or their agents;
- Government concessional lending (Northern Australia Infrastructure Fund (NAIF), Clean Energy Finance Corporation (CEFC));
- Export credit finance; and
- Bank/project financing.

2. Valuation & methodology

Risked & diluted valuation summary

Our base-case risked and diluted A4N valuation is $0.36/sh (or $242m).

Table 2 - Risked & diluted valuation

Valuation case		Bear case	**Base case**	Bull case
4N HPA price assumption US$/t		US$15,000/t	**US$20,000/t**	US$25,000/t
Discount rate	12%			
Exchange rate US$/A$ (long term)	0.74			
EV/EBITDA multiple valuation				
EBITDA/year (steady state) $m		115	183	250
EV/EBITDA multiple	6.5x			
EV T=0 $m		750	1,189	1,628
Years to steady state	5.0			
Time discount multiple x	0.57x			
EV at T-5 $m, before capital costs		425	675	924
Less: Project capital cost (undiscounted) $m	308			
EV from EV/EBITDA method $m		117	**367**	616
EV from NPV method $m		91	**346**	602
Blended project value (50% NPV, 50% EV/EBITDA) $m		104	**357**	609
PV future corporate / admin expenses $m	-$16.7m			
Risk discount to account for project stage % / $m	30%	-31	-107	-183
EV (risked) A$m		56	**233**	410
Net debt / (cash) $m	-$2.5m			
Equity value (risked, undiluted) $m		59	**235**	412
Assumed capital raise $m	$5.0m			
Assumed raise price $/sh (15% discount)	$0.14/sh			
Current shares on issue m	632			
In the money options m	12			
Assumed capital raising dilution m	36			
Diluted shares on issue m	**680**			
Net debt / (cash) (including options & raising) A$m	-$9.3m			
Equity value (risked, diluted) $m		66	**242**	419
Equity value (risked, diluted) $/sh		0.10	**0.36**	0.62
Current share price	$0.165/sh			
Valuation/Price		0.6x	**2.2x**	3.8x

SOURCE: COMPANY DATA AND BELL POTTER SECURITIES ESTIMATES

Our valuation considers the risks and dilution required to generate cash flow for shareholders from A4N's HPA First Project. The valuation is the balance of:

- **Earnings multiple valuation:** Applies an EV/EBITDA multiple of 6.5x to our estimate of A4N's future steady-state pre-tax cash flow. This multiple is informed by the multiples of chemical manufacturing companies listed on both the ASX and globally.

We have subtracted the DFS estimate of the HPA First Project's capital cost from this earnings multiple valuation.

- **Project NPV (unrisked):** Assesses a 20-year project with start-up capital of $308m and annual EBITDA averaging $183m (base case). We assume a discount rate of 12% and other parameters consistent with the HPA First Project DFS.
- **Permitting and construction risks:** Consistent with projects of this maturity (i.e. DFS stage), we have applied a discount to the project NPV of 30% to account for construction, permitting and counterparty risks.
- **Financing risks and capital dilution:** We have included the dilution from A4N's in-the-money options and a $5m equity raising at a 15% discount to the current share price.

Permitting, offtake, construction & ramp-up risks

The HPA First Project assessment had been completed to DFS stage. A4N must now:

- Agree to and complete a definitive Supply and Offtake Agreement with ORI or another suitable chemical company counterparty;
- Complete project permitting associated with land use and other regulatory provisions;
- Secure offtake sales agreements for HPA First production; and
- Construct, commission and ramp-up production at the HPA First facility.

Financing risks & capital dilution

A4N is yet to arrange finance for the construction and working capital required to bring the HPA First Project to first production.

There are many possible combinations of financing available for the project including, but not limited to: project equity (chemical counterparty, offtake customers), technology licencing, government concessional lending (NAIF, CEFC), production prepayments, project financing, and company level debt and equity.

With A4N's March 2020 quarter end cash balance of $2.5m, we assume a near-term equity raising of $5m at a 15% discount to the current share price for corporate working capital and liquidity purposes.

EV/EBITA multiple selection

In valuing A4N, we have applied a multiple of 6.5x the company's steady state EBITDA then subtracted the DFS estimate of the HPA First Project's capital cost. This multiple of 6.5x EBITDA was informed by a review of other listed chemical companies in the Asia pacific region.

The following subset is constrained by:

- GICS classification of Commodity Chemicals;
- Asia Pacific region;
- EV of greater than US$100m; and
- Sufficient Bloomberg data to provide a 1-year forward EV/EBITDA.

Table 3 - Asia Pacific commodity chemicals sector

Company (ticker)	EV US$m	EV/EBITDA (1yr fwd)	Corporate focus
ASAHI KASEI CORP (3407 JP)	14,940	6.5x	Synthetic fibers and other industrial chemical materials
TORAY INDUSTRIES INC (3402 JP)	15,371	6.8x	Fiber and chemical products
MITSUI CHEMICALS INC (4183 JP)	8,303	8.2x	Diversified chemical products
ORICA LTD (ORI AU)	5,635	9.0x	Diversified chemical & explosives
TEIJIN LTD (3401 JP)	5,286	5.9x	Environmental value, safety, security & disaster mitigation solutions
KURARAY CO LTD (3405 JP)	5,353	5.3x	Resins, synthetic leather, chemicals, and non-woven fabrics for apparel & industrial materials
TOSOH CORP (4042 JP)	4,737	5.3x	Petrochemical and other chemical products
DENKA CO LTD (4061 JP)	3,252	6.2x	Diversified chemical products
TOKAI CARBON CO LTD (5301 JP)	2,986	7.7x	Carbon-based industrial products.
KANEKA CORP (4118 JP)	2,837	5.3x	Synthetic resins, and chemicals for foods and medicines
TOYOBO CO LTD (3101 JP)	2,631	7.2x	Natural and synthetic fibers
ZEON CORP (4205 JP)	2,029	4.9x	Synthetic rubbers, synthetic latex, and resins
ADEKA CORP (4401 JP)	1,707	5.0x	Basic chemicals and foodstuffs
LINTEC CORP (7966 JP)	1,336	4.7x	Adhesive products and paper
KUREHA CORP (4023 JP)	1,139	4.9x	Resins and various other chemicals
KH NEOCHEM CO LTD (4189 JP)	812	7.8x	Petroleum chemical products
OKAMOTO INDUSTRIES INC (5122 JP)	539	4.3x	Rubber products.
JSP CORP (7942 JP)	514	5.3x	Polystyrene products used in auto, construction, and other industrial sectors
W-SCOPE CORP (6619 JP)	469	6.7x	Separator film for lithium-ion batteries
FUJIMORI KOGYO CO LTD (7917 JP)	415	3.1x	Plastic wrapping materials mainly for pharmaceuticals and food industries
KURIYAMA HOLDINGS CORP (3355 JP)	164	4.0x	Rubber and resin products used in industrial and construction materials
CARLIT HOLDINGS CO LTD (4275 JP)	155	4.8x	Explosives, chemicals, and electronic materials.
Simple average		5.9x	
Median		5.3x	
EV weighted average		**6.6x**	

SOURCE: BLOOMBERG AND BELL POTTER SECURITIES ESTIMATES
DATA AS AT 19 MAY 2020

3. Risks

Risk to an investment in A4N include, but are not limited to:

- **Commodity price and exchange rate fluctuations.** The future earnings and valuations of development and operating assets and companies are subject to fluctuations in underlying commodity prices and foreign currency exchange rates.
- **Technology:** Projects may be reliant on commercialisation of new production processes and methodologies which have yet been proven on a large scale. Technology may be replicated by competitors resulting in a loss of market share.
- **Infrastructure access.** Projects are reliant upon access to transport and pipeline infrastructure. Access to infrastructure is often subject to contractual agreements, permits and capacity allocations. Agreements are typically long-term in nature. Infrastructure can be subject to outages as a result of weather events or the actions of third party providers.
- **Operating and capital cost fluctuations.** Markets for raw material inputs and labour can fluctuate and cause significant differences between planned and actual operating and capital costs. Key operating costs are linked to commodity and labour markets. Companies are also exposed to costs associated with future land rehabilitation.
- **Sovereign risks.** Companies' assets are subject to the sovereign risk of the country of location and may also be exposed to the sovereign risks of major offtake customers.
- **Regulatory changes.** Changes to the regulation of infrastructure and taxation (among other things) can impact the earnings and valuations of companies.
- **Environmental risks.** Companies are exposed to risks associated with environmental degradation as a result of their production processes.
- **Operating and development risks.** Companies' assets are subject to risks associated with their operation and development. Development assets can be subject to approvals timelines or weather events, causing delays to commissioning and commercial production.
- **Occupational health and safety (OH&S) risks.** Companies are exposed to OH&S risks.
- **Funding and capital management risks.** Funding and capital management risks can include access to debt and equity finance, maintaining covenants on debt finance, managing dividend payments and managing debt repayments.
- **Merger/acquisition risks.** Risks associated with value transferred during merger and acquisition activity.
- **Impact of pandemic infection such as Coronavirus disease (COVID-19).** This may have an adverse impact on the macro economic factors, including the mobility of labour, which can impact asset valuations.

4. HPA First: A disruptive technology

Project summary: Solvent extraction technology

The A4N HPA First Project uses a proprietary solvent extraction and refining technology licenced to A4N. The process was originally developed to extract HPA from alumina bearing laterite ores. However, it has since been modified to operate with aluminium chemical feedstock.

The HPA First process can be summarised as:

1. Key raw materials include commercially available industrial aluminium chemical feedstock and two commonly used chemical reagents;
2. A solvent extraction and crystallisation process that produces an aluminium salt then a HPA pre-cursor product and by-product chemicals for sale to A4N's chemical counterparty (ORI); and
3. The HPA pre-cursor product (aluminium crystal) is dried, calcined and either milled to the required particle size or pelletised for use in lithium ion battery or sapphire glass/LED production.

Definitive feasibility study key outcomes

In March 2020, A4N released the results of a DFS for the HPA First Project. The DFS highlights included:

- Annual HPA production of 10,000t;
- Annual pre-tax free cash flow ranging $133-280m under HPA price scenarios ranging US$15,000-25,000/t;
- Unit cash costs of $8,730/t (US$5,940/t) after by-product credits;
- Project capital costs of $308m (US$209m);
- A payback period ranging less than 2 years to less than 4 years under these HPA pricing scenarios; and
- Regulatory approval in the September 2020 quarter and production ramp-up from late 2022.

Disrupting traditional sources of HPA production

The HPA First Project is expected to disrupt incumbent sources of HPA production in both cost and process.

- The HPA First DFS outlined unit cash costs of US$5,940/t compared with traditional sources of production costing an estimated US$14,000-16,000/t.
- The key HPA First raw materials are an internationally traded industrial aluminium chemical and chemical reagents.
- The HPA First solvent extraction process operates mostly at ambient pressure and temperature.

A principal differentiating factor is that HPA First requires less energy, is a less toxic process and recycles its key reagents as a saleable by-product. A comparison of HPA production routes is provided later in this report. However, given the commercial sensitivities of the HPA First process, there is little detail on the precise chemical process and reactions.

Chemical counterparty: Orica joints the HPA First Project

In February 2020, A4N announced that it had signed a MoU with Orica which sets out the volume and pricing mechanism for the supply of key HPA First reagents and for the offtake of the chemical by-products. This MoU followed detailed negotiations with Orica and other potential chemical counterparties. Orica has exclusivity over the project until 31 July 2020.

Next steps: Detailed engineering for a definitive Supply and Offtake Agreement

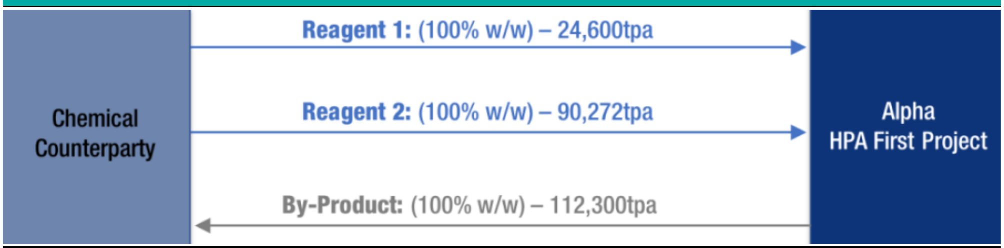
A4N and Orica have subsequently formed a joint Engineering Co-operation Group for a detailed review of the project's reagent supply and by-product offtake interface. The scope of this review includes all physical design parameters, regulatory requirements, operating protocols and measurements associated with the transfer of products between the two counterparties.

It is envisaged that the HPA First Project plant will be located within 2km of Orica's supply source, enabling pipeline delivery of the reagents and by-products in liquid form. A4N's preferred HPA First Project site within the Gladstone State Development Area meets this delivery criteria. Orica's Yarwun production facilities are also located within the Gladstone State Development area.

The counterparties will then move to signing a definitive Product Supply and Offtake Agreement, with conditions precedent being:

- A4N securing land required for pipeline transfer of products;
- A4N raising the required funding to develop the project;
- A4N securing necessary Statutory Approvals;
- Completion of required due diligence by both counterparties;
- Negotiation and finalisation of all required supply and offtake agreements; and
- The internal approvals of both counterparties.

Figure 1 - Chemical counterparty - Reagent Supply & Offtake



SOURCE: A4N ASX ANNOUNCEMENT 10 FEBRUARY 2020

Location & permitting: Gladstone, Queensland

A4N has executed a land purchase agreement for the HPA First Project with Economic Development Queensland for a 10ha site, being lot 12/SP239342 within the Gladstone State Development Area. The company is now negotiating final purchase terms.

The Gladstone State Development Area is 27,194ha located north-west of Gladstone. The area is dedicated for industrial development and materials transportation infrastructure. Other major users of the Gladstone State Development Area include:

- Orica's Yarwun facility – manufacturing of nitric acid, ammonium nitrate and sodium cyanide;
- Rio Tinto's Yarwun alumina refinery; and
- The APLNG, GLNG, QCLNG natural gas liquefaction trains and transport terminals.

A4N has engaged consultants AECOM to assist with preparing the required regulatory documents for the HPA First Project. Pre-lodgement documentation has been submitted with the Queensland Office of the Coordinator General. An Application for Material Change of Use will be made with respect to the Gladstone State Development Area. The timeline provided in the DFS had regulatory approvals being obtained by December 2020.

Figure 2 - Gladstone State Development Area

SOURCE: A4N ASX ANNOUNCEMENT 10 FEBRUARY 2020

Project Background: The HPA First pilot plant

Born out of the Collerina laterite project

The HPA First solvent extraction process was born out of the Collerina Project which was aiming to produce HPA and nickel-cobalt pre-cursor products from an aluminium, nickel and cobalt laterite Resource. The Collerina Resource is located between Cobar and Dubbo in New South Wales' Central West region.

By mid-2018, A4N had identified that the HPA First process was potentially capable of producing HPA using the company's proprietary solvent extraction process from a feedstock blend of available industrial products, rather than an acid leach solution from the Collerina Project. In August 2018, the company announced first successful HPA production via the HPA First process. Collerina Cobalt Ltd (ASX: CLL) became Alpha HPA Ltd (ASX: A4N) in November 2018.

HPA First prefeasibility study completed in November 2018

In November 2018, A4N announced the results of a prefeasibility study on the development of a HPA production facility. The study estimated a project capable of producing 10,000tpa HPA at a capital cost of US$161m and a unit cash cost of US$6,403/t. Results from an update to this study were published in March 2019. The prefeasibility upgrade simplified the process thereby reducing capital costs (US$149m) and operating costs (US$5,123/t).

Pilot plant development for HPA First definitive feasibility study

A4N's next step in the project's development was to build a pilot plant in Brisbane. The pilot plant commenced operations in early July 2019 with two campaigns scheduled to produce HPA at rates of around 4kg/day (for context, 10,000tpa is around 35t/day assuming 80% utilisation). HPA samples of 2-5kg could then be despatched to end users for product testing.

By late September 2019, A4N had announced that the first assays of pilot plant HPA had confirmed purities of greater than 4N (99.99%). A 3kg sample had also been sent to the US for milling and potential customer testing.

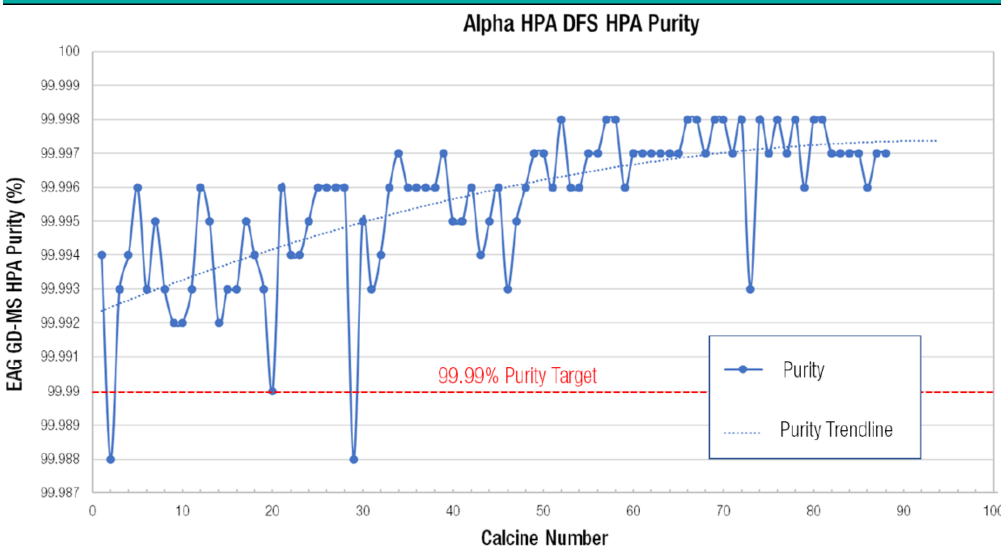
The Pilot Plant also tested aluminium chemical feedstocks from both Queensland and Western Australian sources of supply. A4N found no discernible variation in the performance of the HPA First process using the different feedstocks.

In total, the pilot plant completed three production campaigns with an operating time of over 600 hours producing 62 batches (more than 40kg) of the HPA pre-cursor product.

The following chart shows the results of the analysis of over 80 samples of HPA. There was continuous purity improvement as the studies progressed.

HPA pre-cursor product samples were then sent to Binghamton, New York for milling into a product capable of meeting end-customer quality specifications. The mill operated at near zero measurable contamination, with milled HPA samples successfully passing quality controls for greater than 4N purity.

Figure 3 - HPA Pilot Plant purity

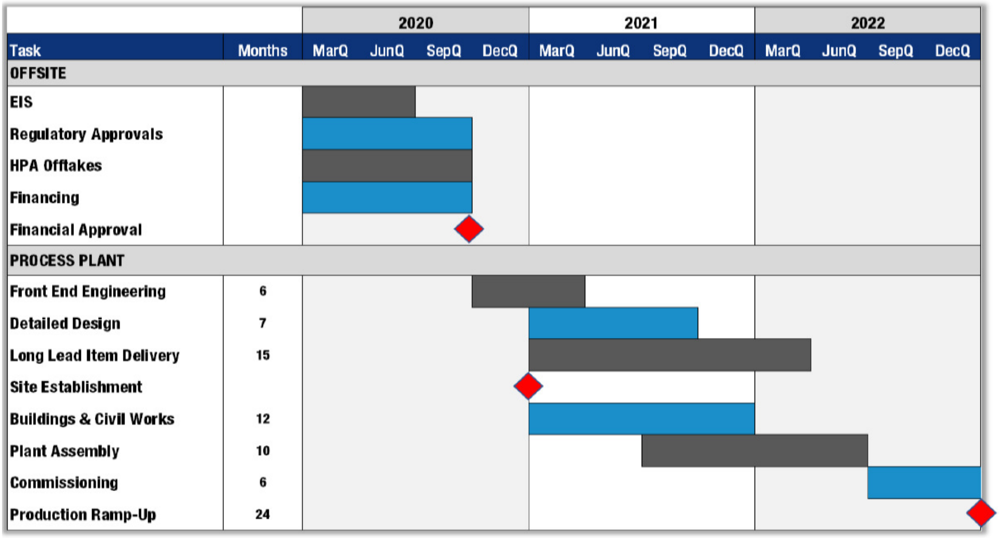


SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020

Project timeline: Project commissioning in mid-2022

A4N's DFS outlined a project implementation schedule suggesting that regulatory approvals could be achieved by December 2020, commissioning in mid-2022 for first production from late 2022. We expect that risks to this timeline are currently greater than normal given the COVID-19 containment measures many companies and regulatory bodies currently have in place.

Figure 4 - Indicative project implementation schedule



SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020

Boehmite: Another potential application of the HPA First tech

HPA First process has also been adapted to manufacture crystalline high-purity (4N) boehmite (aluminium-oxide-hydroxide, Al-O-OH). Boehmite is an alternative product used in ceramic coated separators in the lithium ion battery manufacturing supply chain. The potential for the HPA First Project to also produce boehmite could diversify A4N's ability to respond to end-user demand.

A4N has despatched two 2kg samples of high-purity boehmite to potential end-users in Japan and Korea.

5. HPA First process & DFS

An integrated approach to the DFS

This section outlines some of the specifics of the HPA First DFS. The DFS was completed by Prudentia Process Consulting Pty Ltd (Prudentia), of Brisbane, with input from A4N and other consultants as outlined in the following table. Economic analysis was completed with an accuracy of -10% to +15%.

Figure 5 - DFS workflow and responsibilities

Process	Description	Responsibility
Pilot Plant	Design, construction and operation of the full end-to-end process Flow Sheet from feedstock through to final HPA Product. Operated as 3 campaign with over 600 operating hours	Prudentia PC HPAlumina Pty Ltd Alpha HPA
Engineering	• Equipment Sizing Basis using Mass Balance • Piping and instrumentation diagrams (P&IDs) • Layout drawings • 3D model • Equipment register/enquiries/quote evaluation • Material take-offs (MTOs) • Electrical load list / single line diagrams (SLDs)	Prudentia PC HPAlumina Pty Ltd
Cost Estimation	Operating Cost (OpEx) and Capital Cost (CapEx) estimation	Prudentia PC
Permitting and Approvals	Assessment of the key Government and Regulatory Approval steps through to Project Approval	AECOM Alpha HPA
Marketing	Detailed assessment of HPA market, supply-demand dynamics, interaction with HPA end-users and price discovery	CRU Alpha HPA

SOURCE: A4N ANNOUNCEMENT 17 MARCH 2020

DFS financial outcomes: High-level parameters & costs

The physical and high-level cost parameters of the HPA First Project DFS are outlined in the following table. We do not expect much variation in these parameters going forward.

Table 4 - HPA First DFS physical & high-level cost parameters

Physical parameters			
Aluminium feedstock processed tpa	18,592		
Reagent 1 supply tpa	27,500		
Reagent 2 supply tpa	93,500		
HPA production tpa	**10,000**		
Financial parameters		**A$**	**US$**
Exchange rate A$			$0.68
Average annual cash operating cost $m		$127m	$86m
Unit cash cost $/t HPA		$12,750/t	$8,670/t
Unit by-product credits $/t HPA		-$4,020/t	-$2,730/t
Unit cash cost after by-products $/t HPA		**$8,730/t**	**$5,940/t**
Pre production capital cost $m		**$308m**	**$209m**

SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020

DFS financial outcomes: Pricing scenarios & cash flow

As part of the HPA First ASX release (17 March 2020), A4N outlined pre-tax cash flow outcomes under HPA pricing assumptions of US$15,000/t, US$20,000/t and US$25,000/t. We have added an extra "down-side" scenario with prices at US$10,000/t. The pre-tax cash flow outlined below is after by-product revenues from reagent sale, which represent 10-20% (depending on HPA price assumption) of cash receipts if they are considered as revenue.

Table 5 - HPA First DFS pricing scenarios & cash flows

HPA price scenario	US$25/kg US$25,000/t		US$20/kg US$20,000/t		US$15/kg US$15,000/t		US$10/kg US$10,000/t	
	A$	US$	A$	US$	A$	US$	A$*	US$*
Annual revenue @ 10,000tpa	$368m	$250m	$294m	$200m	$221m	$150m	$147m	$100m
Total costs	-$128m	-$87m	-$128m	-$87m	-$128m	-$87m	-$128m	-$87m
By-product credits *	$40m	$27m	$40m	$27m	$40m	$27m	$40m	$27m
Annual pre-tax cash flow $m	**$280m**	**$191m**	**$207m**	**$141m**	**$133m**	**$91m**	**$60m**	**$41m**
Payback period	<2 years		<3 years		<4 years		<8 years	

SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020, AND (*) BELL POTTER SECURITIES ESTIMATES

DFS financial outcomes: Capital & operating cost breakdown

The DFS capital and operating cost estimates were derived from budget quotes for major equipment, quotes from contractors, market pricing for labour which is assumed to be sourced from the Gladstone area.

Capital cost estimates

- The pre-production capital costs outlined here include direct costs of $235m and indirect costs (EPCM and contingencies) $73m.
- The estimate also includes around $30m associated with the by-product concentration area. This area is still subject to final engineering and evaluation and may be better positioned within the chemical counterparty's operations. As such, a reduction in capital cost with a corresponding increase in operating cost could result.
- The estimate includes first-fills spares, but does not include working capital.

Table 6 - HPA First DFS capital cost estimates

Capital costs	A$m
Processing plant	173
Utilities	19
Infrastructure	39
Indirects	44
Owners costs	7
Total (excluding contingency)	**281**
Contingency (10%)	27
Total	**308**

SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020

Operating cost estimates

- Aluminium feedstock costs assume pricing referenced to published international indices.
- Reagent consumption and costs were determined by the process mass balance and in consultation with the HPA First Project chemical counterparty.

- The DFS assumes a 2-year ramp-up to full production, with nameplate utilisation of 52% in year 1 and 92% in year 2.
- Unit costs in the following table assume full utilisation of the 10,000tpa HPA nameplate capacity.

Table 7 - HPA First DFS operating cost estimates

	Total cost A$m	Total cost US$m	Unit cost A$/t	Unit costs US$/t
Feed & transport	$7.9m	$5.4m	$791	$538
Reagents	$65.6m	$44.6m	$6,555	$4,458
Utilities	$18.0m	$12.3m	$1,804	$1,226
Consumables	$1.8m	$1.2m	$181	$123
Waste disposal	$2.1m	$1.4m	$208	$142
Variable costs	**$95.4m**	**$64.9m**	**$9,539**	**$6,486**
Labour	$19.0m	$12.9m	$1,902	$1,293
General expenses	$4.7m	$3.2m	$473	$322
Maintenance	$6.8m	$4.7m	$684	$465
Contract services	$1.5m	$1.0m	$149	$101
Fixed costs	**$32.1m**	**$21.8m**	**$3,207**	**$2,181**
TOTAL COSTS	**$127.5m**	**$86.7m**	**$12,746**	**$8,667**
By-product credits	-$40.1m	-$27.3m	-$4,011	-$2,728
TOTAL COSTS after by-product credits	**$87.3m**	**$59.4m**	**$8,734**	**$5,939**

SOURCE: A4N ASX ANNOUNCEMENT 17 MARCH 2020

HPA First process: Solvent extraction & refining

The HPA First solvent extraction and refining technology has a number of advantages, namely:

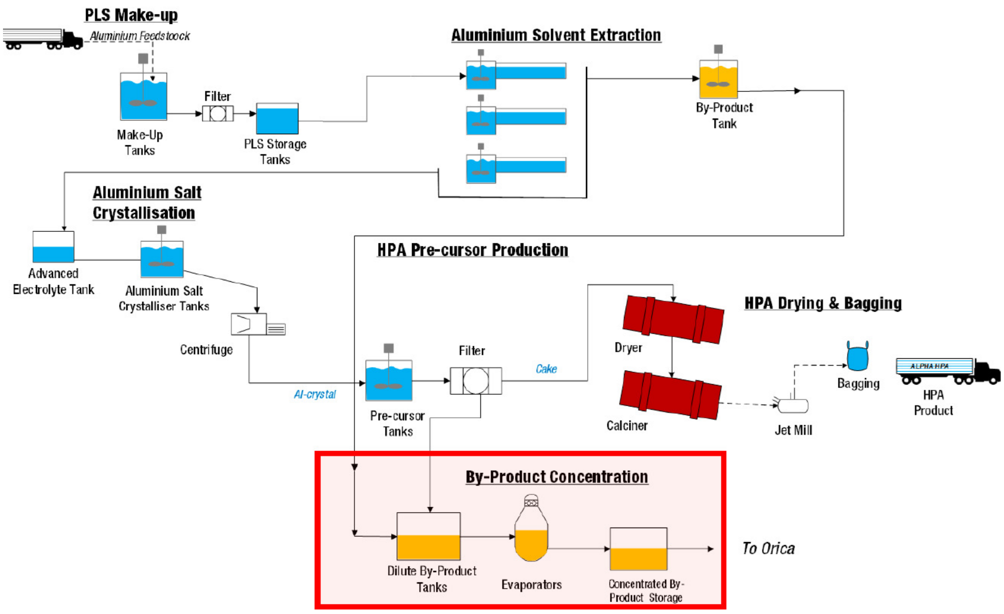
- A simple flow-sheet with a limited number of processing steps;
- The aluminium feedstock is an internationally traded industrial commodity which can be supplied locally with pricing referenced to published international indices;
- Process reagents are capable of being recycled/resold as saleable by-products; and
- The process is largely conducted at atmospheric temperatures and pressures, ahead of the drying and calcination stages (note that drying and calcination stages are common to incumbent HPA production routes).

The following diagram is a simplified outline of the HPA First process flow which includes key process steps:

1. **Feedstock preparation –** approximately 18,600tpa of aluminium feedstock is acquired and prepared as an aluminium bearing solution of approximately 5-6% Al, referred to as the pregnant liquor solution (PLS).
2. **Solvent extraction & raffinate treatment –** A three stage, counter-current solvent extraction process delivers a high purity, aluminium loaded organic which is then washed and the aluminium is stripped into a high-purity aqueous aluminium solution, referred to as the advanced electrolyte. The stripped organic is then recycled back to the aluminium extraction circuit.
3. **Aluminium salt crystallisation –** The advanced electrolyte is cooled to precipitate high-purity aluminium salt crystals in a batch process. The aluminium salt crystal slurry centrifuged and then reports to the HPA pre-cursor production area. This step is the key purification step, with less than 10ppm impurities in the salt crystals (or greater than 5N HPA purity).

4. **HPA pre-cursor production –** The aluminium salt is re-dissolved in a high purity aqueous solution then batch precipitated as HPA pre-cursor and filtered. The HPA pre-cursor cake is then sent to the drying circuit.
5. **By-product concentration** – The two process reagents are treated, concentrated and returned via pipeline to the chemical counterparty (ORI).
6. **Drying, calcination and jet milling** – HPA pre-cursor cake is dried and calcined to alpha form HPA. The HPA is then cooled and milled to the desired particle size distribution (PSD).

Figure 6 - HPA First process flow diagram



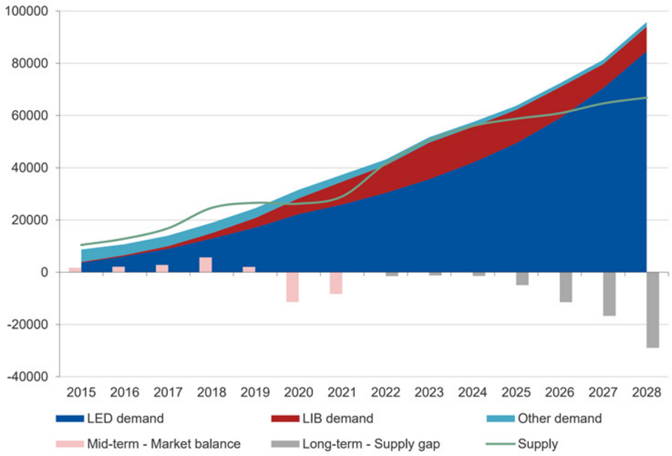
SOURCE: A4N ANNOUNCEMENT 17 MARCH 2020

6. High Purity Alumina market snapshot

As part of the HPA First DFS process, A4N engaged independent commodity research firm, CRU Group, to conduct an analysis of the global HPA market. The analysis included a review of current and projected: HPA supply and producer cost structures; HPA demand; and pricing.

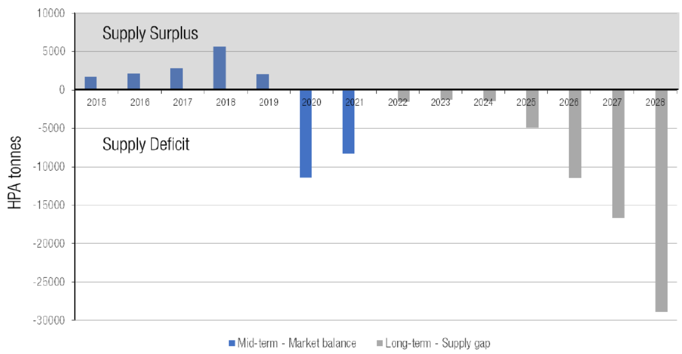
- CRU assess that current demand for 4N HPA is around 30ktpa. However, market demand has an estimated compound annual growth rate of more 17%. By 2028, global 4N HPA demand is expected to be 100ktpa, growing in lock-step with the take-up of lithium ion battery applications.
- This demand forecast is constrained by technical hurdles in the production of sufficient HPA and the ultimate demand destruction which would occur from the resulting high prices for HPA. On an unconstrained basis, CRU expect that compound average annual demand growth rates could be as high as 31.6% and create a HPA market of 500,000tpa by 2028.
- CRU estimate that the 4N+ HPA market is in relative balance until 2020, after which there are projected supply deficits.

Figure 7 - HPA demand projection (CRU Group)



SOURCE: CRU GROUP AS REFERENCED IN A4N 2019 AGM PRESENTATION

Figure 8 - Market balance for 4N+ HPA (CRU Group)



SOURCE: CRU GROUP AS REFERENCED IN A4N ASX ANNOUNCEMENT 17 MARCH 2020

Market demand: Lithium-ion batteries and LEDs

The two primary sources of demand for HPA are:

- **Lithium-ion battery manufacturing:** HPA is one of the preferred ceramics for coating the polyolefin (polymer produced from a simple olefin as a monomer) separator between the anode and cathode in the battery; and
- **Light emitting diode (LED) manufacturing:** HPA is used in the production of synthetic sapphire wafers which are the preferred substrate for manufacturing LEDs.

Both of these manufacturing markets benefit from HPA's key properties. HPA has high thermal stability (very high melting point) and thermal conductivity, is an electrical insulator and has high mechanical strength and hardness.

Lithium-ion battery market: Driven by the electric vehicle outlook

CRU estimate that the total number of lithium-ion battery cells will grow by 25.4% each year across 2018-28. Most of this demand growth will be from the take-up and manufacture of lithium-ion batteries for use in electric vehicles.

HPA ceramic coated separators within lithium-ion batteries have shown to improve battery performance, safety and longevity.

- HPA’s high thermal conductivity and stability means that batteries are less likely to fail due to over-heating.
- HPA’s high strength prevents damage of the separator in the battery manufacturing process.
- Comparative life-cycle tests show batteries with ceramic coated separators last longer than those with standard separators.
- There is comparable or even improved ion permeability with ceramic coated separators, impacting cell power output and efficiency.

In addition to its use as ceramic coating on the lithium-ion battery separator, there have also been early stage tests where battery anodes and cathodes have also been coated with HPA ceramics. Such applications provide possible extensions to the use of HPA in lithium-ion battery manufacturing.

<u>A word on HPA quality in the manufacture of lithium-ion batteries</u>

Much of the abovementioned applications for HPA can be achieved, in part, using 3N (99.9%) purity HPA. The price of 3N HPA has ranged US$5,000-15,000/t compared with 4N HPA at US$15,000-30,000/t.

However, higher purity HPA has been proven to significantly improve battery performance in terms of charge cycles and safety. CRU expect that as product life-cycle becomes increasingly important in consumer purchasing behaviour, manufacturers will be incentivised to use 4N HPA.

A key issue with the use of 3N HPA (as opposed to 4N HPA) is the presence of sodium which leach into and contaminate the lithium ion battery’s electrolyte. Sodium has the effect of hindering the movement of the lithium ions thereby reducing the battery’s discharge capacity. There is virtually no sodium in 4N HPA.

4N HPA also assists in preventing damage to the battery separator during charging cycles. Protecting the separator improves the total charge cycle life of the battery. Moreover, damaged separators can lead to lithium ion battery failure through thermal events such as fires or explosions.

LED market: Efficiency, longevity and simplicity

CRU estimate that the total number of LED units will grow by 14% each year out to 2028 and that demand for 4N HPA for LED production will grow by almost 21% each year, adding 85ktpa demand.

LED lighting and signage has been shown to improve energy efficiency and life-cycle when compared with alternative sources of lighting. Moreover, the manufacture and ultimate disposal of LED lighting is much simpler than alternatives.

Along with growth in demand for LED lighting, the use of HPA in LED manufacturing is also gaining market share. HPA enables the production of larger sapphire wafers, thereby reducing LED production costs. The production of larger sapphire wafers requires ultra-low levels of impurities.

4N HPA pricing: Currently around US$24/kg (US$24,000/t)

CRU's analysis included a review of historical and current 4N HPA pricing. The group reviewed international trade data and interviewed current and prospective HPA market participants including customers, current producers and prospective producers. Based on this analysis, CRU determined that the current price for A4N's 4N HPA would be around US$24/kg (US$24,000/t). For comparison, 3N HPA is currently trading at around US$5-10/kg.

When incorporated with estimates of forecast supply, demand and production costs, CRU expect future pricing of:

- US$24.94/kg nominal (US$22.12/kg real 2018) over 2022-26; and
- US$30/kg nominal by 2028.

CRU noted the many caveats around this HPA price outlook including:

- A4N is yet to fully engage with the manufacturing sector with respect to HPA offtake;
- Manufacturers are still building their understanding of the greater value-in-use of higher grade HPA; and
- A4N may be required to discount from established 4N HPA pricing in order to build the market for its product

A4N ultimately determined price scenarios for the HPA First Project DFS of:

- Scenario 1: US$25/kg (US$25,000/t);
- Scenario 2: US$20/kg (US$20,000/t); and
- Scenario 3: US$15/kg (US$15,000/t).

Traditional routes of HPA production

The two key traditional routes of HPA production are:

1. Kaolin route: Mining of a lateritic clay (Kaolin) which is then roasted and leached using hydrochloric acid. ACH (aluminium chlorohydrate) is then precipitated from the acid leach solution, then converted to HPA via calcination and then milled to meet customer requirements.
2. Alcoxide hydrolysis route: Aluminium metal is combined with alcohol to form an alcoxide solution. This solution then undergoes electrolysis to create a hydrated HPA, which then undergoes calcination and milling to meet customer requirements. This process was developed by Sumitomo and is capable of producing ultra-high purity alumina (5N+).

Common to each process route, including the HPA First process, is the calcination and milling of a HPA pre-cursor product. The HPA pre-cursor product is also required to have purity in excess of 4N to allow for impurities which can enter during the calcination and milling phases.

Figure 9 - HPA First process compared with incumbent processes

KAOLIN ROUTE		BAUXITE ROUTE			
Mining of Kaolin (clay)		**Mining of Bauxite (mineral)**			
		↓		Bayer Process (Inputs: Caustic soda, energy)	
		Alumina		Commodity aluminium oxide	
		Conventional route		**A4N "HPA First" route**	
↓	Roasting (Input: Energy)	↓	Hall–Héroult process (smelting) (Inputs: Energy)	↓	Around one third of aluminium production is for chemical feedstocks
		Aluminium metal		**Alumina chemical feedstock**	
↓	High Pressure Leaching (Input: Hydrochloric Acid)	↓	(Input: Alcohol)	↓	Aluminium solvent extraction (Inputs: Reagents) (Output: Fertiliser by-product) →
		Aluminium alcoxide		↓	Aluminium salt crystallisation
↓	Crystallisation	↓	Hydrolysis (Input: Energy, water)	↓	High Purity Alumina precursor stage (Output: Fertiliser by-product) →
		Hydrated alumina		↓	
↓	Calcination & Milling (Input: Energy)	↓	Calcination & Milling (Input: Energy)	↓	Calcination & Milling (Input: Energy)
High Purity Alumina		**High Purity Alumina**		**High Purity Alumina**	

SOURCE: COMPANY DATA AND BELL POTTER SECURITIES ESTIMATES

Disadvantages of traditional HPA production routes compared with HPA First

The kaolin and alcoxide HPA production routes are more complex and energy intensive than the HPA First process.

Kaolin HPA production:

- Requires a specific high alumina kaolin laterite clay to be mined and processed. This requires arduous feasibility, permitting and mine development processes including meeting environmental and safety requirements, sourcing skilled labour and the risks associated with the development of a natural resource.
- Recycles hydrochloric acid gas at high temperatures, which requires calcination equipment manufactured from high-specification materials to withstand a corrosive, high temperature and high acid environments. These processing plants therefore have relatively high capital costs and higher operational risks.

Alcoxide hydrolysis HPA production:

- Includes the energy intensive production of aluminium metal as part of the production process.
- Hydrolysis of the aluminium alcoxide is an energy intensive process.

Other ASX-listed HPA focussed companies

The following is a brief, non-exhaustive, summary of other ASX-listed companies with potential HPA production projects. Each of these projects is exploring the development of kaolin deposits to produce HPA.

Table 8 - ASX-listed HPA exposures

Company (ASX code)	Market cap A$m	Project & summary	Project stage
Andromeda Metals Ltd (ADN)	90	Poochera halloysite-kaolin resource in South Australia, with short term potential for direct shipping ore markets in China and Japan. ADN are investigating opportunities for supplying premium HPA feedstock.	PFS nearing completion
Altech Chemicals Ltd (ATC)	43	Meckering Western Australia kaolin deposit and Johor, Malaysia HPA plant targeting production of 4,500tpa 4N HPA. The project had a budgeted capital cost of US$298m and production costs of US$8,550/t, with ATC assuming a HPA price of US$26,900/t. ATC has a 10 year offtake agreement with Mitsubishi.	Construction near complete. Site works suspended due to COVID-19 containment measures.
Metalsearch Ltd (MSE)	12	Abercorn halloysite-kaolin deposit in Queensland, Australia. Collaberation with The University of Queensland examining commercialisation opportunities.	Resource drilling and scoping study stage.
FYI Resources Ltd (FYI)	12	Cadoux Kaolin project in Western Australia, with a strategy to develop an integrated HPA project. DFS estimates include annual production of 8,000tpa, capital cost of US$189m, operating cost of US$6,217/t and assumed selling price of US$24,000/t. Commissioning is targeted for 2021-2023.	DFS completed, project financing underway.
Alchemy Resources Ltd (ALY)	8	Predominantly a gold focussed company. ALY's West Lynn project in New South Wales has a Resource containing 6.6Mt grading 20.8% Al_2O_3 with potential for HPA applications.	Early stage. Gold focussed.
Pure Alumina Ltd (PUA)	4	Predominantly a gold focussed company. Yendon HPA project in Victoria, Australia. The company has examined commercialisation of the kaolin deposit for the manufacture of HPA with a PFS completed in mid-2018.	Early stage. Gold focussed.

SOURCE: COMPANY WEBSITES, ASX RELEASES, AND BELL POTTER SECURITIES ESTIMATES

7. Alpha HPA Ltd summary

Company description

A4N's HPA First Project is aiming to supply high-purity alumina (HPA) at a purity of greater than 99.99% (or 4N) to the lithium ion battery and light emitting diode (LED) manufacturing sectors. The project's proprietary technology is expected to disrupt incumbent HPA production through significantly lower unit costs. Results of a definitive feasibility study (DFS) announced in March 2020 outlined a 10,000tpa 4N HPA project with a capital cost of $308m and pre-tax annual cash flow of $133-280m at 4N HPA prices ranging US$15,000-25,000/t (prices are currently around $24,000/t).

HPA First is a solvent extraction process using an aluminium chemical feedstock purchased on globally traded markets. Orica Ltd (ORI) and A4N are advancing a definitive agreement for ORI's supply of process reagents and for by-product offtake. This agreement has required significant third party due diligence of the HPA First process. A 20-year partnership between A4N and ORI is being considered.

Investment thesis: Speculative Buy, Valuation $0.36/sh

Our Buy, Speculative recommendation is supported by the potential for A4N's HPA First Project to generate significant free cash flow through supplying 4N HPA to the high-growth lithium ion battery manufacturing sector. The HPA First technology has passed rigorous due diligence by third party technical consultants and through the partnering process with ORI. A4N provides value leverage to the electric vehicle and renewable energy sectors.

Our A4N risked and diluted valuation is $0.36/sh. A4N is currently a development company with prospective operations and cash flows only. Our Speculative risk rating recognises this higher level of risk and volatility of returns.

Valuation methodology

We have modelled the HPA First Project using assumptions consistent with the March 2020 DFS. We have employed a blended valuation of:

- EV/EBITDA multiple applied to steady state earnings, discounted to present value, less a capital cost assumption; and
- NPV of a 20 year project (consistent with expected ORI agreement).

Other adjustments to our valuation include:

- A 30% risk discount to account for project stage;
- An allowance for corporate and administration costs;
- The conversion of in-the-money options; and
- A $5m capital raise before the end of 2020 at a 15% discount to the current share price for corporate working capital purposes.

Risks

Risk to an investment in A4N include, but are not limited to:

- **Commodity price and exchange rate fluctuations.** The future earnings and valuations of development and operating assets and companies are subject to fluctuations in underlying commodity prices and foreign currency exchange rates.

- **Technology:** Projects may be reliant on commercialisation of new production processes and methodologies which have yet been proven on a large scale. Technology may be replicated by competitors resulting in a loss of market share.
- **Infrastructure access.** Projects are reliant upon access to transport and pipeline infrastructure. Access to infrastructure is often subject to contractual agreements, permits and capacity allocations. Agreements are typically long-term in nature. Infrastructure can be subject to outages as a result of weather events or the actions of third party providers.
- **Operating and capital cost fluctuations.** Markets for raw material inputs and labour can fluctuate and cause significant differences between planned and actual operating and capital costs. Key operating costs are linked to commodity and labour markets. Companies are also exposed to costs associated with future land rehabilitation.
- **Sovereign risks.** Companies' assets are subject to the sovereign risk of the country of location and may also be exposed to the sovereign risks of major offtake customers.
- **Regulatory changes.** Changes to the regulation of infrastructure and taxation (among other things) can impact the earnings and valuations of companies.
- **Environmental risks.** Companies are exposed to risks associated with environmental degradation as a result of their production processes.
- **Operating and development risks.** Companies' assets are subject to risks associated with their operation and development. Development assets can be subject to approvals timelines or weather events, causing delays to commissioning and commercial production.
- **Occupational health and safety (OH&S) risks.** Companies are exposed to OH&S risks.
- **Funding and capital management risks.** Funding and capital management risks can include access to debt and equity finance, maintaining covenants on debt finance, managing dividend payments and managing debt repayments.
- **Merger/acquisition risks.** Risks associated with value transferred during merger and acquisition activity.
- **Impact of pandemic infection such as Coronavirus disease (COVID-19).** This may have an adverse impact on the macro economic factors, including the mobility of labour, which can impact asset valuations.

Appendix 1: Board & management

Table 9 - Board of Directors

Name	Position	Appointed to Board
Norman Seckold	Chairman	November 2009
Rimas Kairaitis	Managing Director	November 2017
Peter Nightingale	Director and CFO	November 2009
Tony Sgro	Non-Executive Director	November 2017
Justin Werner	Non-Executive Director	December 2010

SOURCE: A4N ASX ANNOUNCEMENTS

Board of Directors

Norman Seckold - Chairman

30+ years in the full time management of natural resource companies.

Past Chairman and Director of listed companies including Bolnisi Gold NL, Timberline Minerals Inc., Perseverance Corporation Limited, ValdoraMinerals NL, PalmarejoSilver and Gold Corp. and Cockatoo Coal Limited. Currently Chairman of Santana Minerals Limited and Sky Metals Limited and Deputy Chairman of Nickel Mines Limited.

Rimas Kairaitis - Managing Director

20+ years of experience in minerals exploration and resource development in gold, base metals and industrial minerals. Led the geological field teams to the discovery of the Tomingley and McPhillamy's gold deposits in NSW and steered the Hera gold-lead-zinc Project from discovery through to successful commissioning and commercial production.

Previously founding Managing Director and CEO of ASX-listed Aurelia Metals. Currently Non-Executive Director of Sky Metals Limited.

Peter Nightingale - Director and CFO

20+ years as a Director or Company Secretary for a range of resource companies including Pangea Resources Limited, Timberline Minerals Inc., Perseverance Corporation Limited, ValdoraMinerals NL, Mogul Mining NL, Bolnisi Gold NL, Cockatoo Coal Limited and Planet Gas Limited (now Sky Metals Limited). Currently a Director Nickel Mines Limited, unlisted public company Prospech Limited.

Tony Sgro - Non-Executive Director

Chemical Engineer with 45+ years of senior management experience in the supply of specialised equipment to the process industries with an emphasis on mining and oil & gas. Co-founder, Director and General Manager of Kelair Pumps for 36 years.

Justin Werner - Non-Executive Director

20+ years of mining and management experience. Previously consulted to a number of blue chip mining companies including BHP, Rio Tinto and Freeport McMoran. Successful track record of mine discovery and development. Currently Managing Director of Nickel Mines Limited.

SOURCE: A4N COMPANY WEBSITE

Executive management

Richard Edwards - Company Secretary

Mr Edwards graduated with a Bachelor of Commerce degree from the University of New South Wales, is a Fellow of the Governance Institute of Australia, a member of CPA Australia and holds a Graduate Diploma of Applied Finance and Investment from FINSIA.

He is also Company Secretary of ASX listed Nickel Mines Limited and unlisted public company Prospech Limited.

Martin Kaderavek - Chief Operating Officer

A chemical engineer by background, with 25+ years of experience in complex process plant design, procurement / fabrication, construction, commissioning, operations and maintenance management across a variety of plants across Australia, New Zealand and SE Asia. Industry applications include mining, petrochemical, industrial gases, pulp and paper, steel, and electronics industries, with key customers such as BHP Billiton (Steel), Western Mining, John Lysaght, Australian Paper and BlueScope.

Most recently success in a unique start-up delivering the design, engineering, construction, commissioning and operation a world first manufacturing process plant making a unique fibre product from sugarcane.

Previously COO and Executive Director for a major global mining equipment supplier and service business.

SOURCE: A4N COMPANY WEBSITE

Appendix 2: Capital structure

Capital structure

Table 10 - Capital structure	
Issued shares m	**632**
Share price $	**0.165**
Market cap $m	**104**
Net debt $m	(2)
EV (undiluted) $m	**102**
Options / rights m	12
Issued shares (diluted) m	644
Market cap (diluted) m	**106**
Net debt $m	(4)
EV (diluted) $m	**102**

SOURCE: IRESS

Major shareholders

Table 11 - Substantial shareholders

	Shareholding	% held
Regal Funds Management Pty Ltd (RFM)	88	13.9%
Permgold Pty Ltd (N. Seckold)	67	10.6%
Budworth Capital Pty Ltd <Rolling Hills Capital A/C>	39	6.2%
BT Portfolio Services Limited	34	5.4%
Other	403	63.8%
Total	**632**	

SOURCE: A4N ANNOUNCEMENTS & BELL POTTER SECURITIES ESTIMATES

Alpha HPA Ltd
as at 21 May 2020

Recommendation	Buy, Speculative
Price	$0.165
Valuation	$0.36

Table 12 - Financial summary

Date		**21/05/20**
Price	**A$/sh**	**0.17**
Valuation	**A$/sh**	**0.36**

Bell Potter Securities

Stuart Howe (showe@bellpotter.com.au, +61 3 9235 1856)

PROFIT AND LOSS

Year ending 30 June	Unit	2020e	2021e	2022e	2023e	2024e
Revenue	$m	-	-	-	57	197
Expenses	$m	(6)	(2)	(2)	(30)	(74)
EBITDA	$m	**(6)**	**(2)**	**(2)**	**27**	**123**
Depreciation & amortisation	$m	-	-	(8)	(16)	(16)
EBIT	$m	(6)	(2)	(10)	11	107
Net interest expense	$m	-	-	(6)	(12)	(12)
Profit before tax	$m	(6)	(2)	(16)	(1)	95
Tax expense	$m	-	-	-	-	(29)
NPAT (reported)	$m	**(6)**	**(2)**	**(16)**	**(1)**	**67**
NPAT (adjusted)	$m	**(6)**	**(2)**	**(16)**	**(1)**	**67**

CASH FLOW STATEMENT

Year ending 30 June	Unit	2020e	2021e	2022e	2023e	2024e
OPERATING CASH FLOW						
Receipts from customers	$m	1	-	-	45	169
Payments to suppliers and employe	$m	(5)	(3)	(2)	(27)	(70)
Tax paid	$m	-	-	-	-	(29)
Net interest	$m	-	-	(6)	(12)	(12)
Other	$m	-	-	-	-	-
Operating cash flow	$m	**(4)**	**(3)**	**(8)**	**7**	**59**
INVESTING CASH FLOW						
Capex	$m	(1)	(104)	(222)	(16)	(16)
Acquisitions	$m	-	-	-	-	-
Other	$m	-	-	-	-	-
Investing cash flow	$m	**(1)**	**(104)**	**(222)**	**(16)**	**(16)**
FINANCING CASH FLOW						
Debt proceeds/(repayments)	$m	-	-	200	-	-
Dividends paid	$m	-	-	-	-	(35)
Proceeds from share issues (net)	$m	7	157	-	-	-
Other	$m	-	-	-	-	-
Financing cash flow	**$m**	7	157	200	-	(35)
Change in cash	**$m**	**1**	**50**	**(30)**	**(10)**	**7**
Free cash flow	$m	(5)	(107)	(230)	(10)	42

BALANCE SHEET

Year ending 30 June	Unit	2020e	2021e	2022e	2023e	2024e
ASSETS						
Cash	$m	2	52	22	12	19
Receivables	$m	-	-	-	11	39
Inventories	$m	1	0	0	3	7
Capital assets	$m	4	107	321	322	322
Other assets	$m	0	0	0	0	0
Total assets	**$m**	**6**	**160**	**344**	**349**	**389**
LIABILITIES						
Creditors	$m	2	0	0	6	15
Borrowings	$m	-	-	200	200	200
Provisions	$m	-	-	-	-	-
Other liabilities	$m	-	-	-	-	-
Total liabilities	**$m**	**2**	**0**	**200**	**206**	**215**
NET ASSETS	**$m**					
Share capital	$m	41	197	197	197	197
Reserves	$m	2	2	2	2	2
Accumulated losses	$m	(38)	(40)	(55)	(56)	(25)
Non-controlling interest	$m	(0)	(0)	(0)	(0)	(0)
SHAREHOLDER EQUITY	**$m**	**5**	**159**	**144**	**143**	**174**
Weighted average shares	m	610	906	1,180	1,180	1,180

FINANCIAL RATIOS

Year ending 30 June	Unit	2020e	2021e	2022e	2023e	2024e
VALUATION						
EPS	Ac/sh	(1)	(0)	(1)	(0)	6
EPS growth (Acps)	%	na	na	na	na	na
PER	x	-16.8x	-74.7x	-12.3x	-295.2x	2.9x
DPS	Ac/sh	-	-	-	-	3.0
Franking	%	0%	0%	0%	0%	0%
Yield	%	0%	0%	0%	0%	18%
FCF/share	Ac/sh	(0.9)	(11.8)	(19.5)	(0.8)	3.6
FCF yield	%	-5%	-71%	-118%	-5%	22%
EV/EBITDA	x	-17.0x	-50.9x	-50.9x	3.8x	0.8x
LIQUIDITY & LEVERAGE						
Net debt / (cash)	$m	(2)	(52)	178	188	181
Net debt / Equity	%	-42%	-33%	124%	131%	104%
Net debt / Net debt + Equity	%	-71%	-48%	55%	57%	51%
Net debt / EBITDA	x	0.3x	26.0x	-88.8x	6.9x	1.5x
EBITDA /net int expense	x	0.0x	0.0x	-0.3x	2.3x	10.2x
PROFITABILITY RATIOS						
EBITDA margin	%	na	na	na	48%	62%
EBIT margin	%	na	na	na	20%	54%
Return on assets	%	-107%	-2%	-6%	0%	18%
Return on equity	%	-136%	-2%	-10%	0%	42%

ASSUMPTIONS - Prices (nominal)

Year ending 30 June	Unit	2020e	2021e	2022e	2023e	2024e
4N HPA price	US$/t	20,000	20,000	20,000	20,000	20,000
4N HPA price	A$/t	29,100	28,571	27,586	27,211	27,027
FX	US$/A$	0.69	0.70	0.73	0.74	0.74

ASSUMPTIONS - Sales (equity)

Year ending 30 June	Unit	2018a	2019a	2020e	2021e	2022e
4N HPA sales	kt	-	-	-	2.10	7.30

VALUATION - BASE CASE

HPA First Project (unrisked)		
Multiple valuation (EV/EBITDA) x / $m	6.5x	367
NPV $m		346
Blended project value (50% NPV, 50% EV/EBITDA) $m		**357**
Risk discount to account for project stage % / $m	30%	(107)
PV future corporate / admin expenses $m		(17)
A4N risked EV		**233**
Assumed capital raise $m	$5.0m	
Assumed raise price $/sh (15% discount)	$0.14/sh	
Current shares on issue m	632	
In the money options m	12	
Assumed capital raising dilution m	36	
Diluted shares on issue m	**680**	
Net debt / (cash) (including options & raising) A$m		(9)
Equity value (risked, diluted) $m		**242**
Equity value (risked, diluted) $/sh		**0.36**

SOURCE: BELL POTTER SECURITIES ESTIMATES

Recommendation structure

Buy: Expect >15% total return on a 12 month view. For stocks regarded as 'Speculative' a return of >30% is expected.

Hold: Expect total return between -5% and 15% on a 12 month view

Sell: Expect <-5% total return on a 12 month view

Speculative Investments are either start-up enterprises with nil or only prospective operations or recently commenced operations with only forecast cash flows, or companies that have commenced operations or have been in operation for some time but have only forecast cash flows and/or a stressed balance sheet.

Such investments may carry an exceptionally high level of capital risk and volatility of returns.

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