



## Get \$675m value (NPV in PFS) for \$12m (FYI's market cap)

**Price**

5.4c

**Product**

**High Purity Alumina (HPA)**

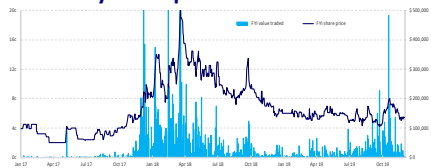
**Samples going to off-takers**

- HPA is a niche product facing good demand growth from LEDs and very strong growth for use in Lithium ion Batteries (as a separator).
- FYI operates a pilot plant to ensure it can produce HPA of the required purity and physical properties to attract binding off-take to finance its first plant. Samples are being sent to potential off-takers.
- The major risk for FYI is in securing off-take, and consequently a partner(s) for the plant. If FYI is successful, its value will be many times the share price.

**Snapshot**

Market Cap	\$11.5m
Cash on hand	\$0.9m
Shares on Issue	213m
52 Week High	8.6c
52 Week Low	3.6c
1 month / 6 month VWAP	7.4c / 5.8c

**FYI : daily share price v. value traded**



FYI announced the results of a Pre-Feasibility Study to produce High Purity Alumina (HPA) from its kaolin deposit at Cadoux, about 220km from Perth WA, in September 2018.

The PFS showed that for Cap.Ex of US\$ 179m, FYI could produce 8,000t/yr of HPA, with average revenue of \$24,000/t and costs of \$6,467/t. This gives an after-tax NPV of US\$ 506m, using 10% d.r.

FYI has developed its own process to produce HPA of at least 99.99%, by innovating a process originally developed in the 1940s. FYI's Resource is enough for more than 50 years of operation.

FYI has constructed, commissioned and operated a pilot plant to test and refine its process and provide product samples to off-take to finance its project.

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**HPA is a niche, valuable product project very high growth in demand**

The price of HPA varies from US\$ 15/kg to over US\$50/kg, depending on

- purity (minimum 99.99% Al<sub>2</sub>O<sub>3</sub>),
- impurities (what the other 100ppm is, with iron (Fe) and Sodium (Na) presenting problems), and
- physical properties (grain size, distribution / uniformity of size, particle density and surface area).

The global market for HPA is estimated to have been 20kt in 2015 and to be over 40kt in 2019, growing to 125kt in 2025, a CAGR of 20%.

Currently, about 48% of HPA's use is in LED lights. While this is expected to continue to grow by about 10% a year, the dominant use is expected to be in Lithium ion Batteries, with newer LiBs using HPA to coat the separator between anode and cathode, allowing greater energy and power.

**FYI has innovated a process for its kaolin**

FYI's process is a development of the Hoffman process, originally developed by Alcoa in the 1940s, focussed on FYI's ore at Cadoux, 220km from Perth.

The pilot plant allows FYI to learn to tweak its process for higher value HPA uses and also to control the process for different HPA uses.

Product samples are being sent to a number of potential off-takers.

**PFS in September 2018; DFS in December 2019**

FYI announced the results of its PFS in September 2018 :

- US\$ 179m in capital to produce 8,000t/yr of HPA;
- HPA cost US\$ 6.467/t, and revenue US\$ 24,000/t;
- NPV US\$ 506m, using 10% discount rate on after-tax cashflows.

Key risks are product quality, off-take and financing.

**FYI's valuation depends on how plant is funded**

Beer & Co expects FYI to joint venture the project. If FYI is able to secure an investment for a 25% stake at 75% of the NPV, with guaranteed off-take for 60% project finance, then FYI's net share is about \$A 425m (US\$ 506m at 0.700 is \$A 720m by 75% is \$A 540m NPV for FYI share, less \$A 115m debt). FYI will need some near term working capital so will have, roughly, 260m shares on issue for an **un-risked** value of \$A 425m; but it needs to be risked.

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## FYI Resources

On 8 May 2017, FYI announced that it had signed an agreement to acquire, subject to due diligence, a kaolin deposit near Cadoux, 220km north-east of Perth, as shown in Figure 1.

**Figure 1 : Cadoux Kaolin deposit, 220km from Perth**



Source : FYI Presentation, February 2018

FYI announced its intention to confirm the acquisition on 26 September 2017. As part of its due diligence, FYI had

- Executed a drill programme to improve its understanding of the shallow, free-dig project and obtain sample for metallurgical test-work;
- Announced a JORC 2012 compliant Mineral Resource Estimate, of 16Mt grading about 22.2%  $Al_2O_3$ , compared with about 10.1Mt historical estimate; and
- Undertaken preliminary metallurgical test-work to upgrade the Run of Mine alumina and produce HPA.

On 23 October 2017, FYI announced that its metallurgical test had produced HPA grading 99.99% (4N)  $Al_2O_3$ .

### Pre-Feasibility Study

After some more drilling and a lot more metallurgical test-work, in September 2018 FYI announced the results of a Pre-Feasibility Study (PFS) to produce High Purity Alumina (HPA).

The extra met test-work was to innovate the Hoffman process, originally developed in the 1940s by Alcoa, to optimise it for the Kaolin from Cadoux.

The results of the PFS included :

- Mine an average of 50kt of kaolin a year to produce 8,000t of HPA grading at least 99.99%  $Al_2O_3$ ;
- \$A 21m capital cost to develop mine and beneficiation plant at Cadoux;
- \$A 217m to develop a processing plant at Kwinana;
- Cash costs US\$ 6.47/kg;
- Revenue US\$ 24/kg.

The PFS advised that, using a discount rate of 10% on the after-tax cashflows, the resulting NPV of US\$ 506m, which is \$A 744m using today's AUD-USD rate of 0.680.

## Since the PFS

Compared with a Mineral Resource Estimate of 16Mt, the PFS proposed to mine only 1.25Mt over the 25 years of the project life.

### Pilot Plant

Since the PFS, FYI has constructed and commissioned a pilot plant that has

- Been operated continuously for more than a week (ie. 168 hours);
- Produced at a rate of just over 1.0kg/hr, or about 8,800kg a year,
  - or about 1 in 1000 scale of the envisaged commercial plant
- Produced HPA of at least 99.99%  $\text{Al}_2\text{O}_3$  with varying qualities of input
  - demonstrating that the developed process has good process control and is able to produce the required quality despite variability in inputs
- Provided samples of HPA product which are being sent to off-take partners to trial;
- Developed FYI's understanding of how to operate the proposed plant; and
- Enhanced FYI's understanding of capital and operating costs.

Figure 2 is FYI's pilot plant, at IMO's laboratory in Welshpool, Perth.

Figure 3 shows the operation of the pilot plant, with Figure 3a showing the first stage, leaching the meta-kaolin in HCl, while Figures 3b, 3c and 3d showing the progressive purification of the leach.

**Figure 2 : FYI's pilot plant**



Source : Beer & Co site visit, October 2019

**Figure 3a : FYI's pilot operations - Leach**



Source : Beer & Co site visit, October 2019

**Figure 3b : FYI's pilot – purification stage 1**



Source : Beer & Co site visit, October 2019

Figure 3c : purification stage 2



Source : Beer & Co site visit, October 2019

Figure 3d : purification stage 3



Source : Beer & Co site visit, October 2019

Figure 4 shows the end result of the leach and purification stages. The final step after this is calcination to produce a product from which all HCl has been evacuated, with most of the HCl being recycled through the process.

The pilot plant has taken longer than originally expected, but in doing so it has significantly de-risked the technology.

Figure 4 : FYI's pilot plant - HPA



Source : Beer & Co site visit, October 2019

FYI has also undertaken further drilling of its Cadoux deposit, to a mine planning standard of 5m by 5m spacing, to ensure that it has a very good understanding of the distribution of the kaolin and its varying qualities.

## Next Steps

### 1. Definitive Feasibility Study (DSF)

FYI now has all the technical information required to complete a DFS, with

- A Mining Lease having been granted, which means that the key permits have been granted, with the further permits needed to begin operations being largely procedural (ie. there is well defined process to complete, requiring more detail on each step);
- A site agreed for the HPA plant at Kwinana;
- Capital and operating costs for mining, beneficiation and refining now determined.

The last step for the DFS is some feed-back from the potential clients to which the samples have been given, which will give "harder" information on the market for the product.

FYI expects to announce to the ASX the results of its DFS during December 2019.

## 2. Off-take agreements

To be able to secure debt financing for the project development, FYI will need to secure off-take agreements from appropriate off-takers (ie. those with sufficient balance sheet to facilitate debt financing).

Off-take agreements will depend on the potential off-takers' perception of the quality of the samples that have been sent. Quality parameters include :

- The Al<sub>2</sub>O<sub>3</sub> grade (ie. 99.99% (4N) base case and 99.999% (5N) higher value);
- Deleterious elements within the 100ppm that is not Al<sub>2</sub>O<sub>3</sub> (in the 4Ns product; or 10ppm in the 5Ns product), with sodium (Na) and iron (Fe) being major issues;
- Consistency of grade; and
- For the powdered product :
  - (i) the average grain size;
  - (ii) The distribution of the grain size (the more consistent the better);
  - (iii) The shape of the grain and the consistency of the shape.

To date, FYI's announcements have been focussed on grade, with no information on the physical properties.

## 3. Project Financing

In their recent presentations, FYI has stated that it will pursue a range of options to finance construction of its Cadoux-Kwinana project, including

- Off-take financing;
- Joint venture, possibly with an off-taker;
- Strategic investor, which may include rights to product and / or rights to participate in future projects;
- Cornerstone investor in the company;
- Project debt; and
- Equity,

## 4. Construction and commissioning

After financing is secured, FYI needs to build its operations at Cadoux and Kwinana.

# High Purity Alumina

Alumina (Al<sub>2</sub>O<sub>3</sub>) is aluminium oxide. Properties of alumina include :

- It is very hard, with a Mohr's hardness of 9.0 and so is used as a shield and also as an abrasive;
- It is inert, as the oxygen-aluminium bond is very hard to break;
- It is impervious to heat, and shields from heat, which is why one use of alumina is as a refractory material; and
- It does not conduct electricity.

The dominant use of alumina is to produce aluminium metal. The alumina from which aluminium is produced is sourced from bauxite, and Australia is a major producer of alumina, with 2 refineries near Gladstone and 4 south of Perth as well as one, which has been shut, in the Northern Territory.

However, that alumina is about 99.5% Al<sub>2</sub>O<sub>3</sub>, and it also has levels of iron (Fe) sodium (Na) and calcium (Ca) that are too high for the uses of High Purity Alumina.

## Uses of HPA

There are 2 forms in which HPA is used :

- As a powder; or
- As a pellet, which is produced by smelting HPA powder.

CRU (Commodity Research Unit) published a HPA industry report in 2018 that estimated the total HPA market at nearly 38kt, across 5 different sectors as shown in Figure 5. The uses of powder are

- Separators for Lithium ion Batteries; and
- Controlling colours produced using Cathode Ray Tubes and also coating the phosphorous used in plasma displays and in fluorescent lighting.

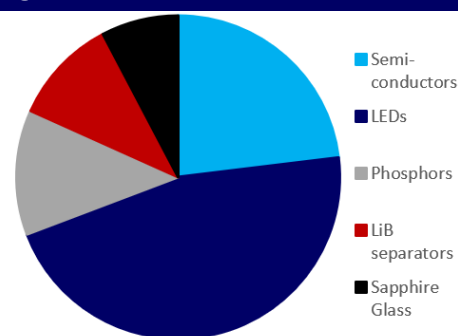
Synthetic sapphire, which is a very hard, impervious, clear “glass” is used as :

- A scratchproof glass in the display in smart phones, watches, tablets, etc;
- A substrate for LEDs; and
- In the fabrication of semi-conductors and the wafer processing equipment due to its high resistance to plasma corrosion.

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**Figure 5 : HPA demand**



Source : CRU, 2018, Beer & Co

Figure 5 shows that Light Emitting Diodes (LEDs) accounted for about 46% of the total demand in 2018.

## Projected HPA Demand Growth

Figure 5 shows that about 10% of the estimated demand for HPA is in the manufacture of lithium ion batteries (LiBs).

This is expected to be the major demand growth for HPA due to :

- Increasing demand for LiBs, primarily due to Electric Vehicles; and
- An increasing use of HPA as a coating on the polymer separator between anode and cathode.

## Separators

Figure 6 shows a typical LiB, with separators between the anode and the cathode. The lithium ion needs to move through the separator, without which the battery will “short” and flare up.

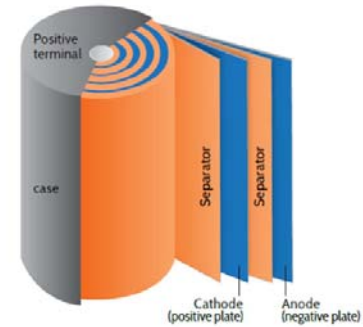
Increasing the performance of a LiB requires increasing

- the amount of energy the battery can hold, and also dis-charge; and
- the speed with which energy can be both input (the re-charge time) and output.

Increasing the energy in a LiB increases the heat generated. The typical separator is a polymer (a plastic) which disintegrates at temperatures above about 130°C, while adding a coating of HPA raises the temperature at which the LiB can operate effectively to about 220°C.

Altech reported, in its September 2019 presentation, that a Japanese manufacturer reported that only 12% of separators were coated in 2018 and that had risen to 40%, while CRU, in its 2018 report, projected that 80% of LiBs will have coated separators by 2028.

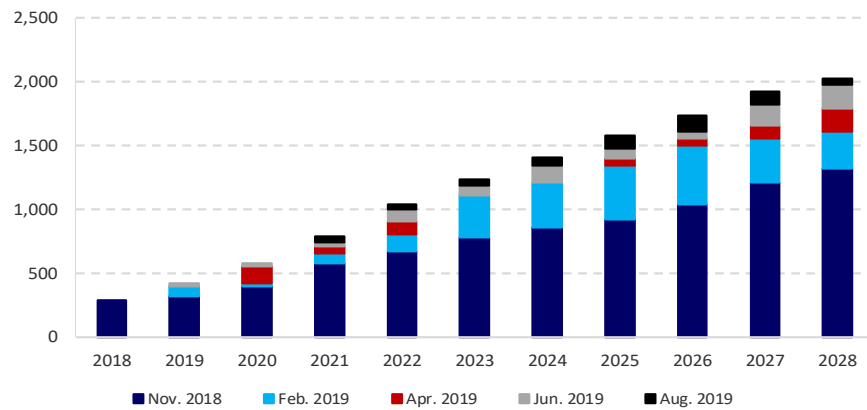
Figure 6 : Separators in LiBs



**EV demand**

The data in Figure 7 is sourced from Benchmark Minerals intelligence (BMI), September 2019 World Tour. It shows the projected output of lithium ion batteries, expressed in GWh, based on announcements of Mega-Factories (and Giga-Factories), which means it is not based on desk-top projections, as is the case for most projections.

Figure 7 : Growing demand for LiBs for Electric Vehicles



Source : Benchmark Minerals Intelligence, “World Tour”, September 2019, Beer & Co

The dark blue bars are the projections that BMI first made in November 2018. It shows that the demand for LiBs was projected to rise from about 290GWh in 2018 to about 1,300GWh in 2028.

The other colours show the increases with each subsequent review by BMI.

It shows that BMI’s projection, based on the announcements of Mega-Factories, which in turn are related to projections by EV manufacturers, increased the projected volume for 2028 from 1,300GWh to over 2,000GWh, an increase of 54% in the space of less than 12 months.

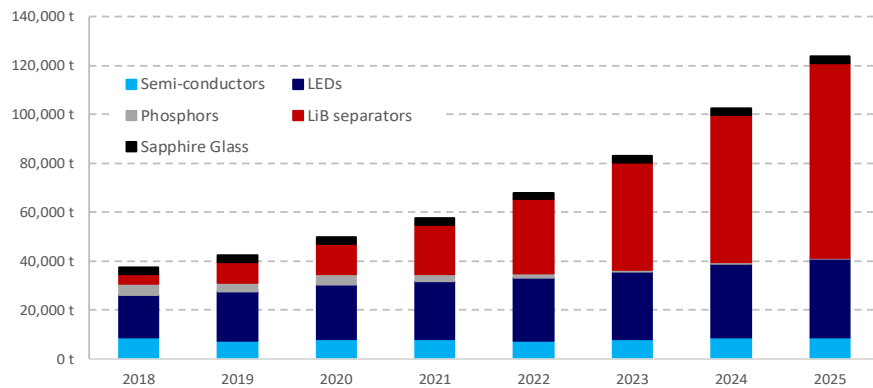
Importantly, Figure 7 shows more significant increases, in percentage terms, in many of the intervening years; eg. 2025 was originally projected to produce 920 GWh of LiB capacity but less than 12 months later this had been increased by over 70% to 1,580Gwh.

### Total Demand Growth

Figure 8 shows that, in its 2018 analysis, CRU expected the demand for HPA to grow :

- from about 20kt in 2015;
- to about 38kt in 2018, a Compound Annual Growth Rate of 24%;
- to about 125kt in 2028, a CAGR of 21% from 2018.

**Figure 8 : Projected demand for HPA**



Source : CRU 2018, Beer & Co

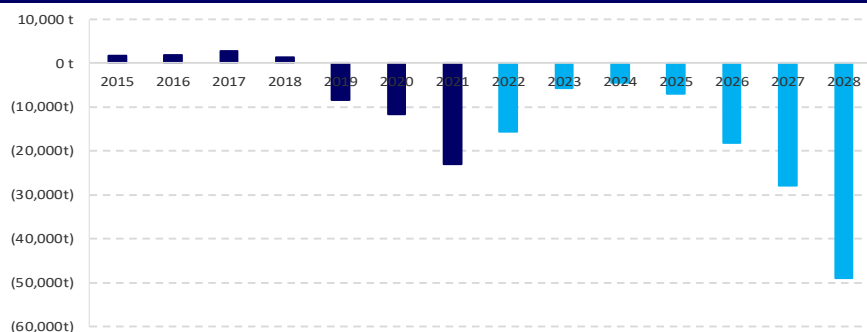
Figure 8 also shows that while the demand for HPA use in LEDs is expected to grow at a CAGR of nearly 10%, its share of overall demand is expected to fall from nearly 50% in 2019 to just over 25% in 2028, due to the overwhelming growth in demand for HPA to coat separators in LiBs.

Figure 8 also shows that other demand for HPA was expected to remain roughly flat.

Figure 9 shows CRU’s conclusion on the overall supply-demand balance, showing :

- 2018 was projected to in small surplus, following years of small surpluses;
- 2019 was projected to be year of deficit, with the deficit being about the total of the surpluses of the previous years (ie. inventory available to cope with the deficit); and
- Subsequent years are projected to be in deficit.

**Figure 9 : Projected supply-demand balance for HPA**



Source : CRU 2018, Beer & Co

In Figure 9 :

- The dark blue bars are based on firm intentions, while the light blue bars are based on indicated intentions and projections (ie. less firm); and
- The supply projections were based on all announced projects proceeding as announced, which CRU acknowledges as being optimistic.



## More recent information

Beer & Co has not been able to access key data from CRU's 2019 review. However, BMI's review, at Figure 7, suggests an increase in HPA demand for LiBs of about 56,000t, increasing the 2025 total from about 125,000t to 180,000t.

## Value of HPA

HPA is not an exchange traded commodity, so its value is set by negotiation in each case between supplier and user.

The major variables in pricing HPA, apart from volume, include :

- Grade, the dominant parameter of which is % Al<sub>2</sub>O<sub>3</sub>, with higher prices for higher grade, and the "standard" grade being 99.99% Al<sub>2</sub>O<sub>3</sub>, or "4 nines" (4N);
- Contaminants; ie. what is contained in the 100ppm (in the case of 4N HPA) that is not Al<sub>2</sub>O<sub>3</sub>, with sodium and iron being the most problematic deleterious elements
  - Sodium (Na) is associated with HPA produced from a bauxite / aluminium source as sodium hydroxide (NaOH, or caustic soda) is the key input in the production of smelter grade alumina from bauxite;
  - This means that higher grades of HPA may not be able to be produced from conventional processes, but will need to be produced from non-standard sources;
- Consistency of grade
  - By operating a pilot plant, FYI has been able to demonstrate process control by producing samples of consistent grade even when the original kaolin varied in quality
- For powdered product, which is required for LEDs and coatings in LiBs, required physical attributes include :
  - the average grain size;
  - The distribution of the grain size (the more consistent the better);
  - The shape of the grain and the consistency of the shape.

Figure 10 shows the prices, in terms of US\$/kg, shown by the ASX listed HPA companies.

**Figure 10 : HPA prices**

USD / kg	ATC		PUA		A4N		FYI	
	Sept. 2019, p. 9		June 2019, p. 22		Oct. 2019, p. 10		Sept. 2019, p. 7	
	Min	Max	Min	Max	Min	Max	Min	Max
<b>3N</b>	\$ 6/kg	\$ 9/kg			\$ 5/kg	\$ 10/kg	\$ 10/kg	\$ 25/kg
<b>4N</b>	\$ 15/kg	\$ 40/kg	\$ 8/kg	\$ 25/kg	\$ 15/kg	\$ 30/kg	\$ 25/kg	\$ 50/kg
<b>5N</b>	> \$50/kg		\$ 25/kg	\$ 50/kg	\$ 30/kg	\$ 50/kg	\$ 50/kg	

Source : ASX presentations (as indicated), Beer & Co

Figure 10 shows :

- The price for HPA increases significantly with quality; and
- There is wide range of price for a given quality, reflecting the other parameters shown above.

Figure 10 also shows that there while there is some overlap between the prices given by the different companies, there are also significant differences in the absolute values.

## Comparatives

There have been up to 5 ASX listed companies that have made announcements on potential HPA projects and Figure 11 shows the 4 that have made definitive announcements.

**Figure 11 HPA companies**

	ATC	A4N	FYI	HEG / PUA
Scope				
PFS		Nov. 2018	Sep. 2018	Jun. 2018
DFS	Jun. 2015 Mar. 2016	Dec. 2019	Dec. 2019	
Cap.Ex	US\$ 298m	US\$ 149m	US\$ 178m	US\$ 271m
C1	US\$ 8,550/t	US\$ 5,123/t	US\$ 6,467/t	US\$ 7,668/t
Volume	4,500 t US\$ 66k/t	10,200 t US\$ 15k/t	8,000 t US\$ 22k/t	8,000 t US\$ 34k/t
First Product		Feb. 2022	Nov. 2021	
shares on issue	743.1 m	632.1 m	212.8 m	221.8 m
price	11.5 c	18.0 c	5.6 c	2.0 c
cash	\$ 2.6m	\$ 3.7m	\$ 0.9m	\$ 1.1m
Enterprise Value	\$ 82.8m	\$ 110.1m	\$ 11.0m	\$ 3.3m
fully diluted	\$ 85.9m	\$ 115.0m	\$ 11.0m	\$ 3.3m

Source : ASX announcements, IRESS, Beer & Co

In addition to the ASX listed companies, there is also an un-listed company that has stated it is seeking to develop a project to produce 5,000t/yr of HPA.

## Comments

### 1. PUA

Figure 11 includes PUA, which was based on a Canadian technology, Polar Sapphire, which had announced a capital cost of US\$ 60m for a plant to produce 5,000t/yr HPA at a cash cost of about US\$ 7,500/t.

Before that, PUA had announced its intention to produce HPA from its kaolin deposit at Yendon, near Ballarat, in Victoria.

However, when PUA was not able to fulfil a Condition Precedent for the acquisition of Polar Sapphire, it announced that it would focus on its Hill End copper-gold project, rather than its Yendon Kaolin project.

As a result, Beer & Co assumes that neither project is presently proceeding.

### 2. Total Volume

The total of the projects in Figure 11, including the un-listed project, is just short of 30kt/yr of HPA, though it can be expected that this will take until 2022 / 23 to come into production.

Figure 8 shows that the projected growth in demand from 2019 to 2023 is about 40kt/yr, which means that the surge in potential supply is less than the expected demand.

Further, the history has been slippage in project timelines and there must be doubt about production from Polar Sapphire.

### 3. Enterprise Value

FYI has a significantly lower market cap than either ATC or A4N, despite FYI's successful operation of its pilot plant.

## Financing

The key conclusions from FYI's 25 September 2018 announcement of its PFS results were

- Capital cost US\$ 178m;
- Produce 8,000t/yr of HPA at a cash cost of US\$ 6,467/t, compared with US\$24,000/t revenue for annual net cash generated of US\$ 140m (8,000 x (24,000 – 6,467));
- NPV US\$ 506m on the after-tax cashflows.

While these are the parameters for a very attractive investment, the investment market will not provide US\$ 178m in funding for a company with a market value of \$A 12m (or US\$ 8m).

At slide 16 of their September 2019 presentation, FYI states that it is examining funding options including :

- Off-take financing;
- Joint venture;
- Cornerstone investor;
- Strategic investor;
- Project debt; and / or
- Equity.

In Beer & Co.'s view, from an economic perspective, the first 4 of these options are equivalent FYI sells a portion of its project and the purchaser provides capital and some credibility and expertise.

As HPA is not an exchange traded commodity, any financing will require bankable off-take agreements.

In Beer & Co.'s view, subject to the quality of the samples produced through FYI's pilot plant, the potential is favourable due to the projected

- Strong growth in demand; and
- Deficit in the market in all future years.

## Key Risks

FYI has already significantly de-risked the project through

- Construction, commissioning and successful operation of its pilot plant, which has provided samples for potential off-takers as well as demonstrating the control the process has to be able to produce consistent output;
- The Mining Licence has been granted;
- The project has been granted Lead Agency, which facilitates remaining approvals for the proposed Kwinana operations and development.

The remaining risks relate to :

- The off-takers' assessment of the quality of the samples that have been provided; and
- The consequent appetite for off-takers to enter into bankable supply agreements; and
- The desire of off-takers, or other parties, to invest in the project.

## Beer & Co.'s view

Beer & Co has modelled the project and in our view :

- The AUD-USD rate has fallen from 0.750 at the time of the PFS and is now about 0.680, which reduces both capital and operating costs in USD terms, enhancing the NPV;
- Using cost models we have developed over the last 3 decades, we found the mining and beneficiation costs in the PFS significantly higher than we would have expected, indicating cost down potential.

The most significant variable is revenue. Beer & Co note that the PFS assumed average revenue of US\$ 24/kg and we note that FYI reported :

- An average grade of 99.999% in its ASX announcement of 13 March 2019
  - this was from Locked Cycle test-work and involved an extra precipitation in distilled water which reduced the recovery from 95%, or more, to about 90%;
- Average grades of 99.997% and 99.998% in its ASX announcement of 17 September 2019, from feed that varied in quality, as opposed to being a blended, consistent feed as will be the case in commercial production
- Average grade of 99.99% from the first run of the pilot plant.

In Beer & Co.'s view, FYI should be able to achieve some sales of 5N product, possibly at a small cost to recovery / throughput.

## Operations

### Resources and Reserves

FYI announced the potential acquisition of the Cadoux project on 8 May 2017. At that time it had an Inferred Resource of 10.5Mt grading 21.26% Al<sub>2</sub>O<sub>3</sub> (quoted as 11.25% Al).

Figure 12 shows the Mineral Resource Estimate announced by FYI on 26 July 2017, showing a resource estimate of 16Mt, of which 13Mt is in the Indicated category.

Figure 13 shows the Mineral Resource Estimate included in FYI's 25 September 2018 announcement of its PFS.

This resource estimate was based on a strip ratio of 2.07t of waste for each tonne of Kaolin ore.

**Figure 12 : Resource estimate, July 2017**

		Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O
Indicated	13.0 Mt	21.88 %	0.67 %	0.57 %
Inferred	3.1 Mt	23.6 %	1.0 %	0.8 %
<b>TOTAL</b>	<b>16.1 Mt</b>	<b>22.21 %</b>	<b>0.73 %</b>	<b>0.62 %</b>

Source : FYI Resources' 26 July 2017 ASX announce't, Beer & Co

**Figure 13 : Revised Resource estimate**

		Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	
Indicated	Low K <sub>2</sub> O	2.1 Mt	25.9 %	1.0 %	0.2 %
	High K <sub>2</sub> O	1.1 Mt	21.6 %	0.9 %	2.6 %
<b>Total Indicated</b>		<b>3.2 Mt</b>	<b>24.4 %</b>	<b>1.0 %</b>	<b>1.0 %</b>
Inferred	Low K <sub>2</sub> O	4.3 Mt	23.3 %	0.7 %	0.3 %
	High K <sub>2</sub> O	2.0 Mt	20.1 %	0.8 %	3.0 %
<b>Total Inferred</b>		<b>6.3 Mt</b>	<b>22.3 %</b>	<b>0.7 %</b>	<b>1.2 %</b>
<b>Total Low K<sub>2</sub>O</b>		<b>6.4 Mt</b>	<b>24.2 %</b>	<b>0.8 %</b>	<b>0.3 %</b>
<b>Total High K<sub>2</sub>O</b>		<b>3.1 Mt</b>	<b>20.6 %</b>	<b>0.8 %</b>	<b>2.9 %</b>
<b>Total Resources</b>		<b>9.5 Mt</b>	<b>23.0 %</b>	<b>0.8 %</b>	<b>1.1 %</b>

Source : FYI Resources' 25 Sept. 2018 ASX announce't, Beer & Co

FYI's PFS was based on 94% Indicated Resources and the balance Inferred.

On 29 October, 2018, FYI announced a Probable Ore Reserve for Cadoux, of about 2.9Mt, as shown in Figure 14.

Each of the stages shown represents a mining campaign as 3 years of material can be mined in about 3 months.

## PFS

FYI announced the results of its PFS on 25 September 2018.

Figure 15 shows the key capital cost and operating costs from that announcement (in the column "PFS").

As shown in Figure 15, the announcement was made in USD terms, with a USD-AUD rate of 0.750 assumed.

Figure 15 shows the impact on the USD cost from using the current AUD-USD rate of about 0.680, showing lower capital and operating costs.

In its 25 September 2018 announcement, FYI also stated that its mining cost was \$A 7.6/t of material mined. As the waste to ore ratio in the Reserves is lower than that in the PFS, so fewer tones are mined, the total mining costs will now be lower than that shown in Figure 15.

Figure 16 shows Beer & Co.'s modelling of FYI's mining and beneficiation operations at Cadoux.

**Figure 14 : Ore Reserve, October 2018**

	Ore	Al <sub>2</sub> O <sub>3</sub>	Waste	
stage 1	172 kt	24.8 %	317 kt	1.8
stage 2	175 kt	25.1 %	225 kt	1.3
stage 3	175 kt	24.5 %	255 kt	1.5
stage 4	165 kt	22.7 %	376 kt	2.3
stage 5	165 kt	23.4 %	396 kt	2.4
stage 6	192 kt	25.9 %	290 kt	1.5
stage 7	247 kt	26.1 %	159 kt	0.6
stage 8	130 kt	25.5 %	125 kt	1.0
stage 9	92 kt	23.5 %	167 kt	1.8
stage 10	169 kt	25.6 %	364 kt	2.2
stage 11	275 kt	23.0 %	481 kt	1.7
stage 12	347 kt	24.4 %	535 kt	1.5
stage 13	225 kt	24.8 %	499 kt	2.2
stage 14	363 kt	23.5 %	774 kt	2.1
<b>Total</b>	<b>2,892 kt</b>	<b>24.4 %</b>	<b>4,963 kt</b>	<b>1.7</b>

Source : FYI's ASX announcement, 20 October 2018, Beer & Co

**Figure 15 : Impact of change in AUD-USD**

	PFS	0.750	0.680
Capital	US\$ 179m	\$A 238m	US\$ 162m
<b>/t HPA</b>			
Mining	US\$ 107/t	\$A 143/t	US\$ 97/t
Beneficiation	US\$ 769/t	\$A 1,025/t	US\$ 697/t
Refining	US\$ 5,591/t	\$A 7,455/t	US\$ 5,069/t
<b>Total, C1</b>	<b>US\$ 6,467/t</b>	<b>\$A 8,623/t</b>	<b>US\$ 5,863/t</b>

Source : FYI's 25 Sept 2019 ASX announcement, Beer & Co

**Figure 16 : Beer & Co.'s modelling of FYI's proposed mining and beneficiation operations, Cadoux**

	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45
Ore mined	172 kt	0 kt	0 kt	175 kt	0 kt	0 kt	0 kt	175 kt	0 kt	0 kt	0 kt	0 kt	0 kt	247 kt	0 kt	0 kt
Reserves	2,720 kt	2,720 kt	2,720 kt	2,545 kt	2,545 kt	2,545 kt	2,545 kt	2,370 kt	2,370 kt	2,370 kt	1,848 kt	1,848 kt	1,848 kt	1,601 kt	1,601 kt	1,601 kt
Kaolin ore processed	33 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt	50 kt
Al <sub>2</sub> O <sub>3</sub> grade	24.8 %	25.1 %	25.1 %	25.1 %	24.7 %	24.5 %	24.5 %	24.5 %	22.7 %	22.7 %	26.1 %	26.1 %	26.1 %	26.1 %	25.5 %	25.5 %
Al <sub>2</sub> O <sub>3</sub> recovery	78 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %	87 %
Concentrate grade	40 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %	43 %
Concentrate trucked	16 kt	25 kt	25 kt	25 kt	25 kt	25 kt	25 kt	24 kt	23 kt	23 kt	26 kt	26 kt	26 kt	26 kt	26 kt	26 kt

Source : Beer & Co estimates

Figure 12 shows that, compared with the July 2017 Mineral Resource Estimate of 16Mt, and a Probable Ore Reserve of 2.9Mt, the project mines and processes only 1.3Mt of ore over 24 years of operation.

This indicates significant upside potential to the estimated throughput and production.

Figure 17 shows Beer & Co.'s modelling of FYI's proposed refining operations at Kwinana.

**Figure 17 : Beer & Co.'s modelling of FYI's proposed refining operations, at Kwinana**

	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45
Concentrate Processed	13.3 kt	25.2 kt	25.2 kt	25.2 kt	24.8 kt	24.6 kt	24.6 kt	24.4 kt	22.8 kt	22.8 kt	26.0 kt	26.0 kt	26.0 kt	26.0 kt	26.0 kt	26.0 kt
Recovery to HPA	72 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %	75 %
HPA produced	3.9 kt	8.2 kt	8.2 kt	8.2 kt	8.1 kt	8.0 kt	8.0 kt	8.0 kt	7.4 kt	7.4 kt	8.5 kt	8.5 kt	8.5 kt	8.5 kt	8.5 kt	8.5 kt
HPA - 4N	3.7 kt	7.6 kt	7.3 kt	7.0 kt	6.6 kt	6.2 kt	6.0 kt	6.0 kt	5.6 kt	5.6 kt	6.4 kt	6.4 kt	6.4 kt	6.4 kt	6.4 kt	6.3 kt
HPA - 5N	0.2 kt	0.6 kt	0.9 kt	1.2 kt	1.5 kt	1.8 kt	2.0 kt	2.0 kt	1.9 kt	1.9 kt	2.1 kt	2.1 kt	2.1 kt	2.1 kt	2.1 kt	2.1 kt
	3.3 %	7.0 %	11.0 %	15.0 %	19.0 %	23.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %	25.0 %

Source : Beer &amp; Co estimates

The PFS also assumed a royalty rate of 5%. This is the royalty applicable to an intermediate product, such as a copper concentrate, or possibly a beneficiated meta-kaolin.

In Beer & Co.'s view, the appropriate royalty rate is 2.5%, which is the rate applicable to a finished product, such as copper cathode (and gold bars), as the HPA is not upgraded or further processed after it has been sold by FYI.

### Beer & Co.'s modelling

Figure 14 shows Beer & Co.'s projections for FYI, adjusting the data in the PFS :

- The AUD-USD rate from 0.750 to 0.680;
- Lower total mining cost due to the lower waste : ore ratio in the Ore Reserves Estimate compared with the PFS;
- Lower royalty rate, from 5.0% to 2.5%.

Also, Beer & Co has modelled over 200 different mining and processing operations over the last 3 decades, and the costs for mining and beneficiation indicated by the PFS are much higher than would be expected from a simple, shallow operation.

Figure 18 shows the outcome of Beer & Co.'s modelling, showing :

- Our base case assumes prices of \$20/kg for 4N material and \$40/kg for 5N material;
- Beer & Co assumes that the proportion of 5N product increases over time.

**Figure 18 : Beer & Co.'s projections of FYI's operations**

100% basis	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2042-43	2043-44	2044-45	
HPA - 4N	\$ 21/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	\$ 20/kg	
HPA - 5N	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	\$ 40/kg	
AUD-USD	0.685	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	0.680	
Project Capital	\$ 0m	(\$193m)	(\$49m)													
4N HPA sold	0.0 kt	0.0 kt	3.7 kt	7.6 kt	7.3 kt	7.0 kt	6.6 kt	6.2 kt	6.0 kt	6.0 kt	5.6 kt	5.6 kt	6.4 kt	6.4 kt	6.3 kt	
5N HPA sold	0.0 kt	0.0 kt	0.2 kt	0.6 kt	0.9 kt	1.2 kt	1.5 kt	1.8 kt	2.0 kt	2.0 kt	1.9 kt	1.9 kt	2.1 kt	2.1 kt	2.1 kt	
Av. Price, USD/kg	\$ 21/kg	\$ 21/kg	\$ 21/kg	\$ 21/kg	\$ 22/kg	\$ 23/kg	\$ 24/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	\$ 25/kg	
Revenue	\$ 0m	\$ 0m	\$ 119m	\$ 259m	\$ 268m	\$ 278m	\$ 283m	\$ 290m	\$ 295m	\$ 292m	\$ 273m	\$ 273m	\$ 312m	\$ 312m	\$ 311m	
Cash Costs	\$ 0m	\$ 0m	\$ 37m	\$ 65m	\$ 65m	\$ 65m	\$ 64m	\$ 64m	\$ 63m	\$ 63m	\$ 60m	\$ 60m	\$ 66m	\$ 66m	\$ 66m	
Royalties	\$ 0m	\$ 0m	\$ 3m	\$ 6m	\$ 7m	\$ 7m	\$ 7m	\$ 7m	\$ 7m	\$ 7m	\$ 7m	\$ 7m	\$ 8m	\$ 8m	\$ 8m	
Dep'cn & Amort'sn	\$ 0m	\$ 0m	\$ 10m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 20m	\$ 0m	\$ 0m	\$ 0m	
Interest	\$ 0m	\$ 3m	\$ 11m	\$ 7m	\$ 3m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	
N P B T	\$ 0m	(\$3m)	\$ 57m	\$ 157m	\$ 170m	\$ 184m	\$ 193m	\$ 200m	\$ 204m	\$ 202m	\$ 187m	\$ 187m	\$ 238m	\$ 238m	\$ 237m	
Tax Expense	\$ 0m	\$ 0m	\$ 16m	\$ 47m	\$ 51m	\$ 55m	\$ 58m	\$ 60m	\$ 61m	\$ 61m	\$ 56m	\$ 56m	\$ 71m	\$ 71m	\$ 71m	
N P A T	\$ 0m	(\$3m)	\$ 41m	\$ 110m	\$ 119m	\$ 129m	\$ 135m	\$ 140m	\$ 143m	\$ 142m	\$ 131m	\$ 131m	\$ 166m	\$ 166m	\$ 166m	
<b>Project, Equity Cashflow</b>																
Project capital	(\$3m)	(\$97m)	(\$18m)	(\$36m)	(\$36m)	(\$36m)	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	\$ 0m	
Net Ops	\$ 0m	\$ 0m	\$ 78m	\$ 188m	\$ 197m	\$ 205m	\$ 213m	\$ 220m	\$ 224m	\$ 221m	\$ 207m	\$ 207m	\$ 237m	\$ 238m	\$ 238m	
taxes paid	\$ 0m	\$ 0m	(\$16m)	(\$47m)	(\$51m)	(\$55m)	(\$58m)	(\$60m)	(\$61m)	(\$61m)	(\$56m)	(\$56m)	(\$71m)	(\$71m)	(\$71m)	
NET	(\$3m)	(\$97m)	\$ 43m	\$ 104m	\$ 110m	\$ 114m	\$ 155m	\$ 160m	\$ 163m	\$ 160m	\$ 151m	\$ 151m	\$ 165m	\$ 167m	\$ 167m	
	(US\$2m)	(US\$66m)	US\$ 29m	US\$ 71m	US\$ 75m	US\$ 77m	US\$ 105m	US\$ 109m	US\$ 111m	US\$ 109m	US\$ 102m	US\$ 102m	US\$ 112m	US\$ 113m	US\$ 113m	

Source : Beer &amp; Co estimates

Figure 18 shows strong cashflows and a very quick recovery of the capital invested.

The net cashflows shows assume 60% debt financing, which is a very standard assumption.

## Conclusions

### Kaolins are not kaolins

FYI has developed its own processes to produce HPA from its deposit.

Beer & Co. suggest that the fact that PUA has not re-activated its Yendon kaolin project supports the view that not all kaolins are suitable for HPA.

FYI's kaolin is derived from Archean granites and the older, more weathered rocks are more suited to producing HPA.

### Pilot Plant de-risks project

FYI has developed a pilot plant which is a significant de-risking of the project. The major risk for FYI is the quality of the samples that have been distributed to off-takers.

### Finance

If the quality is as expected, given the announcements FYI has made to the ASX on the results of its metallurgical tests, coupled with the projected supply-demand balance, which is now expected to be much tighter than that shown in Figure 6, Beer & Co expects that

- FYI will be able to secure a strategic investor, especially given that this project proposes to use only 1.3Mt of ore, compared with 16Mt in Resources at Cadoux; and
- Project finance will be made available, due to
  - the strong cash margins;
  - the performance of the pilot plant;
  - off-take agreements.

Figure 19 shows Beer & Co.'s view

- of potential finance, by selling a 25% stake in the project, possibly with some extra incentive like rights to participate in expansions, at 75% of the NPV; and
- of the impact of changes in the AUD-USD rate and royalties on the NPV.

**Figure 19 : Adjusted project NPV**

	PFS	AUD-USD	Royalties
Project NPV, USD m	507	534	555
25% of project	127	133	139
75% of value	95	100	104
<b>to FYI, after-tax</b>	<b>81</b>	<b>85</b>	<b>88</b>
Project Cap.Ex	178	166	166
65% debt	116	108	108
Equity required	62	58	58
<b>Excess from sale</b>	<b>19</b>	<b>27</b>	<b>30</b>

Source : FYI PFS, Beer & Co estimates

Importantly, Figure 19 shows that the value received by FYI from selling a 25% stake at a discount of 25% to its NPV yields sufficient funds, coupled with project financing, that FYI will not need further equity, apart from some working capital to get these arrangements in place.

### Impact on FYI

If FYI sells a 25% stake then the value of its remaining 75% stake, adjusting for changes in the AUD-USD rate and royalties, is US\$ 415m (US\$ 555m by 75%), or \$A 600m at AUD-USD rate of 0.680.

FYI currently has 213m shares on issue.

FYI may need to raise some further equity; if we allow for a further 50m shares to be issued, then FYI will have about 260m on issue, for a \$A 480m, un-risked, share of the asset, net of debt of \$A 120m (US\$ 108m, by FYI's 75% share, at 0.680).

## Concluding Comments

FYI Resources announced the results of its Pre-Feasibility Study on the development of the Cadoux kaolin deposit, about 220km from Perth, to produce High Purity Alumina (HPA) at a to be constructed facility at Kwinana.

Despite announcing a resource of 16Mt in July 2017, the PFS was based on mining and processing only about 1.3Mt of kaolin over 24 years to produce 8,000t/yr of HPA, grading 99.99% and 99.999% Al<sub>2</sub>O<sub>3</sub>.

### HPA

Demand for HPA has grown from just under 20kt in 2015 to nearly 40kt in 2019 and is projected to continue to grow at a Compound Annual Growth Rate of about 20%, reaching 125kt by 2025.

The dominant current use of HPA is as a substrate in producing LEDs and this is expected to continue to grow at a CAGR of about 10%.

HPA is also used in certain niche applications where it is valued for its hardness and for its imperviousness to heat.

The major demand driver for HPA demand will be in Lithium ion batteries, where HPA is used to coat the polymer separator between the anode and the cathode. As LiBs are packed with more energy and power, the LiB will operate in hotter conditions that cause the separator to break down.

Given the volume of LiBs that are projected to be manufactured, based on the announced plans for EV models and mega-Factories, and the increased use of HPA on separators, demand for HPA is expected to grow strongly.

### Pilot Plant

HPA, produced from kaolin, is a new product and FYI has refined and developed the Hoffman process, originally developed in the 1940s by Alcoa, to produce HPA from its Cadoux kaolin.

Not all kaolins are able to produce HPA.

By constructing, commission and operating its own pilot plant, FYI has significantly de-risked its project.

Samples are being sent from the pilot plant to potential off-take partners.

If FYI's samples are favourably received, then Beer & Co is confident that FYI will be able to enter into a joint venture with a off-taker or a strategic partner which should result in that partner effectively paying for the equity FYI needs to be able to construct its plants, as well as ensure debt finance.

### Final

If FYI is successful, and needs to raise only a small amount of further equity, then the valuation of FYI could be a multiple of the current share price, given an un-risked, net value of \$A 480m with about 260m share on issue.

However, the risk, at this stage, ahead of off-takers acceptance of FYI's samples, is high.

Given this uncertainty, with a wide range in the potential valuation due to the risk, a point estimate of valuation cannot be given. However, given the results of metallurgical test-work to date, it is likely to be a significant premium, or multiple, of the current share price.



FYI Resources (FYI.ASX)		November 2019							
Year ended June		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
<b>Section 1 - P&amp;L</b>									
Sales revenue	\$A m	0	0	0	89	194	201	209	213
Interest revenue	\$A m	0	0	1	0	1	1	2	3
Other revenue	\$A m	0	140	0	0	0	0	0	0
<b>Total Revenue</b>	<b>\$A m</b>	<b>0</b>	<b>140</b>	<b>1</b>	<b>90</b>	<b>195</b>	<b>203</b>	<b>211</b>	<b>215</b>
Cost of Goods Sold	\$A m	0	0	0	(28)	(49)	(49)	(49)	(48)
Royalties	\$A m	0	0	0	(2)	(5)	(5)	(5)	(5)
Corporate Costs	\$A m	(1)	(1)	(3)	(5)	(5)	(5)	(5)	(5)
Exploration Expense	\$A m	(3)	0	0	0	0	0	0	0
Other Operating Expenses	\$A m	0	0	0	0	0	0	0	0
<b>Total Operating Expenses</b>	<b>\$A m</b>	<b>(4)</b>	<b>(1)</b>	<b>(3)</b>	<b>(34)</b>	<b>(58)</b>	<b>(59)</b>	<b>(59)</b>	<b>(58)</b>
<b>EBITDA</b>	<b>\$A m</b>	<b>(4)</b>	<b>139</b>	<b>(2)</b>	<b>55</b>	<b>136</b>	<b>144</b>	<b>152</b>	<b>157</b>
Dep'n & Amort'n	\$A m	0	0	0	10	10	10	10	10
<b>EBIT</b>	<b>\$A m</b>	<b>(4)</b>	<b>139</b>	<b>(2)</b>	<b>65</b>	<b>146</b>	<b>154</b>	<b>162</b>	<b>167</b>
Interest Expense	\$A m	(0)	0	(1)	(9)	(7)	(4)	(0)	3
Other	\$A m	0	0	0	0	0	0	0	0
<b>Pre-Tax Profit</b>	<b>\$A m</b>	<b>(4)</b>	<b>139</b>	<b>(3)</b>	<b>56</b>	<b>139</b>	<b>150</b>	<b>162</b>	<b>170</b>
Tax Expense	\$A m	1	(42)	1	(17)	(42)	(45)	(48)	(51)
<b>NPAT</b>	<b>\$A m</b>	<b>(3)</b>	<b>97</b>	<b>(2)</b>	<b>39</b>	<b>97</b>	<b>105</b>	<b>113</b>	<b>119</b>

## Section 2 - Key Data

Ordinary shares - year end	m	212.8	262.8	262.8	262.8	262.8	262.8	262.8	262.8
Fully diluted shares on issue	m	225.2	275.2	270.9	262.8	262.8	262.8	262.8	262.8
Weighted # shares	m	199.6	237.8	262.8	262.8	262.8	262.8	262.8	262.8
Earnings per Share	(0.9c)	40.9 c	(0.9c)	15.0 c	37.1 c	40.0 c	43.0 c	45.2 c	
Dividends Per Share	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	

## Section 3 - Balance Sheet

Cash	\$A m	1	139	48	62	117	177	242	339
Receivables	\$A m	1	0	0	24	25	26	26	27
Other	\$A m	0	0	0	1	1	0	1	1
<b>CURRENT ASSETS</b>	<b>\$A m</b>	<b>2</b>	<b>139</b>	<b>48</b>	<b>87</b>	<b>142</b>	<b>203</b>	<b>269</b>	<b>367</b>
Receivables	\$A m	0	0	0	0	0	0	0	0
P, P & E	\$A m	0	0	145	175	160	145	131	116
Mining Properties / Explor	\$A m	4	6	5	4	4	4	3	3
Other	\$A m	0	0	0	0	0	0	0	0
<b>NON-CURRENT ASSETS</b>	<b>\$A m</b>	<b>4</b>	<b>6</b>	<b>149</b>	<b>179</b>	<b>164</b>	<b>149</b>	<b>134</b>	<b>119</b>
<b>TOTAL ASSETS</b>	<b>\$A m</b>	<b>5</b>	<b>145</b>	<b>197</b>	<b>266</b>	<b>306</b>	<b>352</b>	<b>404</b>	<b>486</b>
Payables	\$A m	1	0	0	4	4	4	4	4
Debt	\$A m	0	0	0	19	36	41	17	0
Other	\$A m	0	0	0	0	0	0	0	0
<b>CURRENT LIABILITIES</b>	<b>\$A m</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>40</b>	<b>45</b>	<b>21</b>	<b>4</b>
Long Term Debt	\$A m	0	0	73	93	57	17	0	0
Other	\$A m	0	0	0	0	0	0	0	0
Provisions	\$A m	0	0	0	0	0	0	0	0
<b>NON-CURRENT LIABILITIES</b>	<b>\$A m</b>	<b>0</b>	<b>0</b>	<b>73</b>	<b>93</b>	<b>57</b>	<b>17</b>	<b>0</b>	<b>0</b>
<b>TOTAL LIABILITIES</b>	<b>\$A m</b>	<b>1</b>	<b>0</b>	<b>73</b>	<b>116</b>	<b>97</b>	<b>61</b>	<b>21</b>	<b>4</b>
<b>NET ASSETS</b>	<b>\$A m</b>	<b>4</b>	<b>145</b>	<b>124</b>	<b>150</b>	<b>209</b>	<b>291</b>	<b>383</b>	<b>482</b>
Accumulated Profit (Loss)	\$A m	(35)	62	60	99	197	302	415	534
Reserves	\$A m	2	43	24	11	(27)	(51)	(71)	(91)
Contributed Equity	\$A m	37	40	40	40	40	40	40	40
minorities	\$A m	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
<b>Total Equity</b>	<b>\$A m</b>	<b>4</b>	<b>145</b>	<b>124</b>	<b>150</b>	<b>209</b>	<b>291</b>	<b>383</b>	<b>482</b>

## Section 4 - Cashflow

Net Cashflow from operatio	\$A m	(4)	139	(2)	55	136	144	152	157
Net Interest Paid	\$A m	0	0	(0)	(8)	(6)	(2)	2	6
Taxes Paid	\$A m	0	0	17	19	44	46	48	49
Change in Working Capital	\$A m	2	(2)	0	28	0	0	2	(0)
<b>OPERATING CASHFLOW</b>	<b>\$A m</b>	<b>(2)</b>	<b>137</b>	<b>14</b>	<b>94</b>	<b>174</b>	<b>188</b>	<b>203</b>	<b>212</b>
Exploration + Feasibility	\$A m	(3)	(3)	0	0	0	0	0	0
Maintenance Capex	\$A m	0	0	0	0	0	0	0	0
Expansion Capex	\$A m	0	0	(193)	(49)	0	0	0	0
<b>PPE Acquisitions (Total Ca)</b>	<b>\$A m</b>	<b>(3)</b>	<b>(3)</b>	<b>(193)</b>	<b>(49)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PPE Divestments	\$A m	0	140	0	0	0	0	0	0
<b>INVESTING CASHFLOW</b>	<b>\$A m</b>	<b>(3)</b>	<b>137</b>	<b>(193)</b>	<b>(49)</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Change in Equity	\$A m	1	2	0	0	0	0	0	0
Dividends Paid	\$A m	0	0	0	0	0	0	0	0
Change in Debt	\$A m	0	(0)	73	39	(19)	(36)	(41)	(17)
<b>FINANCING CASHFLOW</b>	<b>\$A m</b>	<b>1</b>	<b>2</b>	<b>73</b>	<b>39</b>	<b>(19)</b>	<b>(36)</b>	<b>(41)</b>	<b>(17)</b>

## Product price assumptions

Year ended June		2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
AUD/USD		0.715	0.685	0.680	0.680	0.680	0.680	0.680	0.680
HPA - 4N	USD/kg	25	21	20	20	20	20	20	20
HPA - 5N	USD/kg	50	40	40	40	40	40	40	40

## HPA Sales, FYI share

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
HPA - 4N	t	0 t	2,798 t	5,734 t	5,488 t	5,241 t	4,920 t	4,634 t	4,514 t
HPA - 5N	t	0 t	114 t	432 t	678 t	925 t	1,153 t	1,384 t	1,505 t

## Total FYI Costs

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Total FYI Costs	USD/kg	0.0	7.0	5.9	5.9	5.9	6.0	6.0	6.0

## Resources (100% basis)

		Al <sub>2</sub> O <sub>3</sub>				Fe <sub>2</sub> O <sub>3</sub>				K <sub>2</sub> O			
Indicated	Low K <sub>2</sub> O	2.1 Mt	25.9 %	1.0 %	0.2 %								
	High K <sub>2</sub> O	1.1 Mt	21.6 %	0.9 %	2.6 %								
<b>Total Indicated</b>		<b>3.2 Mt</b>	<b>24.4 %</b>	<b>1.0 %</b>	<b>1.0 %</b>								
Inferred	Low K <sub>2</sub> O	4.3 Mt	23.3 %	0.7 %	0.3 %								
	High K <sub>2</sub> O	2.0 Mt	20.1 %	0.8 %	3.0 %								
<b>Total Inferred</b>		<b>6.3 Mt</b>	<b>22.3 %</b>	<b>0.7 %</b>	<b>1.2 %</b>								
<b>Total Low K<sub>2</sub>O</b>		<b>6.4 Mt</b>	<b>24.2 %</b>	<b>0.8 %</b>	<b>0.3 %</b>								
<b>Total High K<sub>2</sub>O</b>		<b>3.1 Mt</b>	<b>20.6 %</b>	<b>0.8 %</b>	<b>2.9 %</b>								
<b>Total Resources</b>		<b>9.5 Mt</b>	<b>23.0 %</b>	<b>0.8 %</b>	<b>1.1 %</b>								

## Reserves (100% basis)

		Ore	Al <sub>2</sub> O <sub>3</sub>	Waste	
		2,892 kt	24.4 %	4,963 kt	1.7 : 1

## Ore mined

Annual Average : 54 kt/yr Total, project life : 1,291 kt

discount rate = 12.0 %		30 June 2019		27-Nov-19
AUD m	risk :	100%	Product	per share
Kwinana, FYI share	50 %	506	253	
expansion	0 %	301	0	
Asset Sale	25 %	125	31	
franking credits	30 %	294	88	
Corporate	100 %	(34)	(34)	
Equity raisings	100 %	2	2	
Cash / Debt	100 %	1	1	
<b>TOTAL</b>		<b>\$ 1,195m</b>	<b>\$ 341m</b>	
Shares on issue		212.8m	F P O shares	12.4m
		50.0m	to be issued	0.0m
			exercised	

## Financial Ratios

Year ended June		2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Revenue	\$A m	140	1	90	195	203	211
EBITDA	\$A m	139	(2)	55	136	144	152
EBIT	\$A m	139	(2)	65	146	154	162
NPAT (reported)	\$A m	97	(2)	39	97	105	113
Adjusted EPS (cps)		40.9 c	(0.9c)	15.0 c	37.1 c	40.0 c	43.0 c
EPS Growth (%)			(102%)	1,741 %	147 %	8 %	8 %
DPS (c)		0.0 c	0.0 c	0.0 c	0.0 c	0.0 c	0.0 c
Dividend Yield (%)		0 %	0 %	0 %	0 %	0 %	0 %
PE adj. (x)	x	0.1	(5.8)	0.4	0.1	0.1	0.1
EV / EBITDA (x)	x	(0.9)	(18.3)	1.2	(0.1)	(0.7)	(1.4)
EV / EBIT (x)	x	(0.9)	(18.3)	1.0	(0.1)	(0.7)	(1.3)
Gearing (%)		0 %	37 %	42 %	30 %	16 %	4 %
Return on Assets		96 %	(1%)	24 %	48 %	44 %	40 %
Return on Equity		67 %	(2%)	26 %	47 %	36 %	30 %
EBITDA Margin (%)		n/a	n/a	n/a	62 %	70 %	72 %
Interest Cover (x)	x	n/a	n/a	(1.7)	7.5	20.3	40.0

## Major shareholders

Andrew Spinks	26.7m	12.5 %						
Regal Funds Mngmt	23.9m	11.2 %						
Roland Hill (MD)	13.7m	6.4 %						
<b>Free Cashflow</b>	<b>\$A m</b>	<b>(4)</b>	<b>274</b>	<b>(179)</b>	<b>45</b>	<b>174</b>	<b>188</b>	<b>203</b>
<b>Net Cashflow</b>	<b>\$A m</b>	<b>(3)</b>	<b>276</b>	<b>(106)</b>	<b>84</b>	<b>155</b>	<b>152</b>	<b>163</b>

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