



FYI Resources Ltd (FYI.ASX)

Alcoa-Backed High-Margin Emerging HPA Developer

Event:

- We initiate research coverage on FYI Resources Ltd (FYI.ASX).

Investment Highlights:

- FYI Resources Ltd (FYI)** is an ASX listed company developing its Cadoux Kaolin HPA project in WA (100% interest), comprising the Cadoux mine and proposed HPA refinery at Kwinana. FYI aims to be a single source integrated producer of high quality HPA with supply provenance wholly from a tier 1 mining jurisdiction.
- Massive, long life, high grade HPA asset:** DFS contemplates a 25-year project life comfortably underpinned by only 47% of Reserve, the total of which potentially supports a 55-year project. Resources could support a 175-year project, if fully converted to Reserve. JORC Reserve contains 3.2Mt at 24.8% Al₂O₃, while the Resource stands at 11.3Mt at 22.5% Al₂O₃.
- Robust economics in high-margin project:** DFS (released March 2020) highlights include NPV₁₀ US\$543M and IRR of 46%. Attractive capital intensity with modest capex of US\$189M for 8ktpa of 4N HPA product. Swift payback of 3.6 years. High margin project with low operating cost of US\$6,217/t. Shallow, low-lying, high grade deposit with campaign mining facilitates negligible mining cost.
- Alcoa MOU offers potential finance flexibility.** The joint pilot plant has now commenced after recently signed MOU with Alcoa offers possible pathway to JV as well as potential balance sheet access to assist with project financing.
- Demand from LIB separators and LEDs to drive HPA supply deficit.** Forecast CAGR of almost 20% for HPA demand as market expected to enter deficit from 2025 with increased demand from EVs to drive demand for LIB separators.
- Cash of \$8M at following recent raise and no debt.** Secured equity finance of A\$80M significantly reduces funding risk. FYI is negotiating with Alcoa to progress Cadoux as a JV, which we suspect will come with balance sheet access to reduce project risk further.

Earnings and Valuation:

- We forecast commissioning and ramp in FY23e with **first full year of production in FY24e to deliver earnings of \$94M**.
- We have derived a risked valuation of \$0.68 per FYI share (0.65x NPV).** Our valuation is underpinned by an unrisks NPV₁₀ of A\$770M for Cadoux in the base, assuming first production in FY23e, twelve-month ramp, and HPA price of US\$24,000/t.
- Considerable valuation upside potential:** we note further drivers of value in the Cadoux project include life extension, potential production capacity upgrade, and/or inclusion of by-product revenue, deliberately omitted by the DFS.

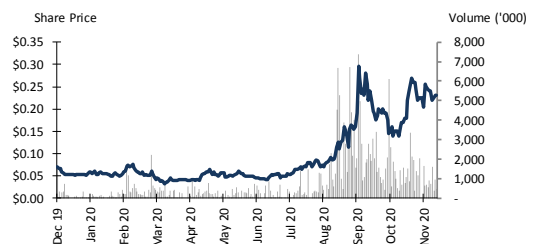
Recommendation:

- We initiate coverage of FYI with a **Buy recommendation and price target of \$0.68/share**, due to its long life, high grade kaolin asset, and low-cost processing HPA refinery project.
- Catalysts for the stock** include: 1) FEED and FID decisions and commencement of the Cadoux HPA project; 2) customer offtake MOUs and marketing relationships; 3) updates on financing arrangements; 4) updates on the Alcoa JV; and 5) updates on LOM extension, capacity upgrade, and/or by-products.

Disclosure

The analyst does not own FYI securities. Foster Stockbroking and associated entities (excluding Cranport Pty Ltd) own 1,406,815 FYI shares. Cranport Pty Ltd owns 796,250 FYI shares and 750,000 FYI options with \$0.10 exercise price and July 2021 expiry. Foster Stockbroking acted as Sole Lead Manager to the \$6M placement of 30M FYI shares at \$0.20 in December 2020 and to the \$2.7M placement of 45M FYI shares at \$0.06 in August 2020. Foster Stockbroking received fees for these services. Refer to end of report for details.

Recommendation	Buy			
Previous	N/A			
Risk	High			
Price Target (A\$/share, risked)	\$0.68			
Previous	N/A			
Share Price (A\$)	\$0.225			
ASX Code	FYI			
52 week low - high (A\$)	0.033-0.295			
Capital structure				
Shares on Issue (M)	300.8			
Market Cap, undil. (A\$M)	68			
Net Cash/(Debt) (A\$M)	8			
EV (A\$M)	60			
12mth Av Daily Volume ('000)	762			
Y/e Jun A\$	FY20a	FY21e	FY22e	FY23e
Sales, \$M	0.0	0.0	0.0	76.5
EBITDA adj. \$M	-2.6	-2.5	-4.9	52.1
NPAT adj. \$M	-2.1	-2.8	-10.6	28.3
EPS adj c	-1.0	-0.1	-0.5	1.4
PER (x)	nm	nm	nm	nm
Dividend c	0.0	0.0	0.0	0.0
Board				
Edmund Babington				Non-Executive Chairman
David Sergeant				Non-Executive Director
Adrian Jessup				Non-Executive Director
Roland Hill				Managing Director
Major Shareholders				
A Spinks				9.9%
Regal Funds				9.0%
Share Price Graph				



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FYI Resources Ltd (FYI)

Full Year Ended 30 June

Profit and Loss A\$M	2020a	2021e	2022e	2023e	2024e
Revenue	0	0	0	76	256
Other income	0	0	0	0	0
Operating Costs	3	3	5	25	72
EBITDA	-3	-3	-5	52	184
D&A	0	0	0	6	44
EBIT	-3	-3	-5	46	141
Net Interest exp / (income)	0	0	5	6	6
PBT	-3	-3	-11	40	135
Tax exp / (benefit) adj.	-1	0	0	12	40
NPAT underlying	-2	-3	-11	28	94
Non-recurring items	0	0	0	0	0
NPAT reported	-2	-3	-11	28	94
EPS diluted, adj. cps	-1.0	-0.1	-0.5	1.4	4.5

Cashflow A\$M	2020a	2021e	2022e	2023e	2024e
EBITDA	-3	-3	-5	52	184
Change in WC	1	4	4	-11	-7
Tax paid	1	0	0	-12	-40
Other	0	0	25	0	0
Net interest	0	0	-5	-6	-6
Share based payments	0	0	0	0	0
Operating Cashflow	-1	2	19	23	131
Purchase of PP&E	0	-25	-241	-5	-5
Acquisitions	0	0	0	0	0
Capitalised expenses	0	0	-1	1	0
Investments	0	0	0	0	0
Investing Cashflow	0	-25	-242	-4	-5
Equity issue	0	0	189	0	0
Debt proceeds	1	80	0	0	0
Debt repayments	-1	0	0	0	0
Other	0	0	0	0	0
Financing Cashflow	0	80	189	0	0
Net Cashflow	-1	57	-34	19	126

Balance Sheet A\$M	2020a	2021e	2022e	2023e	2024e
Cash	0	57	23	42	167
Receivables	1	0	0	6	21
PPE	0	25	265	265	227
Capitalised exploration	0	0	1	0	0
Intangibles	0	0	0	0	0
Other	6	6	6	10	0
Total Assets	7	87	295	323	415
Accounts payable	1	4	9	4	12
Provisions	0	0	0	2	6
Debt	1	81	81	81	81
Other	2	2	27	29	15
Total Liabilities	4	87	116	115	113
Reserves and capital	41	41	230	230	230
Retained earnings	-37	-40	-50	-22	72
NCI	0	0	0	0	0
Total Equity	3	1	179	207	302

Source: Company; Foster Stockbroking estimates

Financial Metrics	2020a	2021e	2022e	2023e	2024e
Sales growth, %	nm	nm	nm	nm	235%
EPS growth, %	nm	nm	nm	nm	233%
EBITDA margin, %	nm	nm	nm	68%	72%
EBIT margin, %	nm	nm	nm	61%	55%
Gearing (ND/ND+E)	17%	98%	24%	16%	-40%
Interest Cover (EBIT/net int)	29.0x	43.5x	1.0x	-7.7x	-24.9x
Average ROE %	-56%	-139%	-12%	15%	37%
Average ROA %	-46%	-6%	-3%	15%	38%
Wtd ave shares (M)	213	2,051	2,051	2,051	2,051
Wtd ave share diluted (M)	213	2,080	2,080	2,080	2,080

Assumptions	2020a	2021e	2022e	2023e	2024e
Prices					
HPA, US\$/t	24,000	24,000	24,000	24,000	24,000
AUDUSD	0.69	0.72	0.74	0.75	0.75
Production					
HPA, kt	0.0	0.0	0.0	2.4	8.0
Costs					
C1, US\$/t	nm	nm	nm	6,306	6,275
AISC, US\$/t	nm	nm	nm	9,969	7,844

Company Valuation	Unrisked		Risky	
DCF, WACC 10% nominal	A\$M	A\$/sh	A\$M	A\$/sh
Segment				
Cadoux, base case	770	\$0.70	539	\$0.49
Cadoux, extension, total Reserve only	277	\$0.25	111	\$0.10
Corporate	-60	-\$0.05	-42	-\$0.04
Net cash (debt)	8	\$0.01	8	\$0.01
Cash, equity facility	80	\$0.07	80	\$0.07
Cash, equity raise	71	\$0.06	49	\$0.04
Cash from in money options	8	\$0.01	6	\$0.01
Total	1,153	\$1.05	751	\$0.68

Capital Structure	M
Ordinary shares	301
Options	56
Fully diluted	357

JORC Resources and Reserves	Ore, Mt	Al ₂ O ₃	Fe ₂ O ₃	K ₂ O	TiO ₂
Cadoux (100%)					
Reserves	3.2	24.8%	1.1%	0.5%	0.9%
Resources	11.3	22.5%	0.9%	1.0%	nd

FYI RESOURCES LIMITED (FYI)

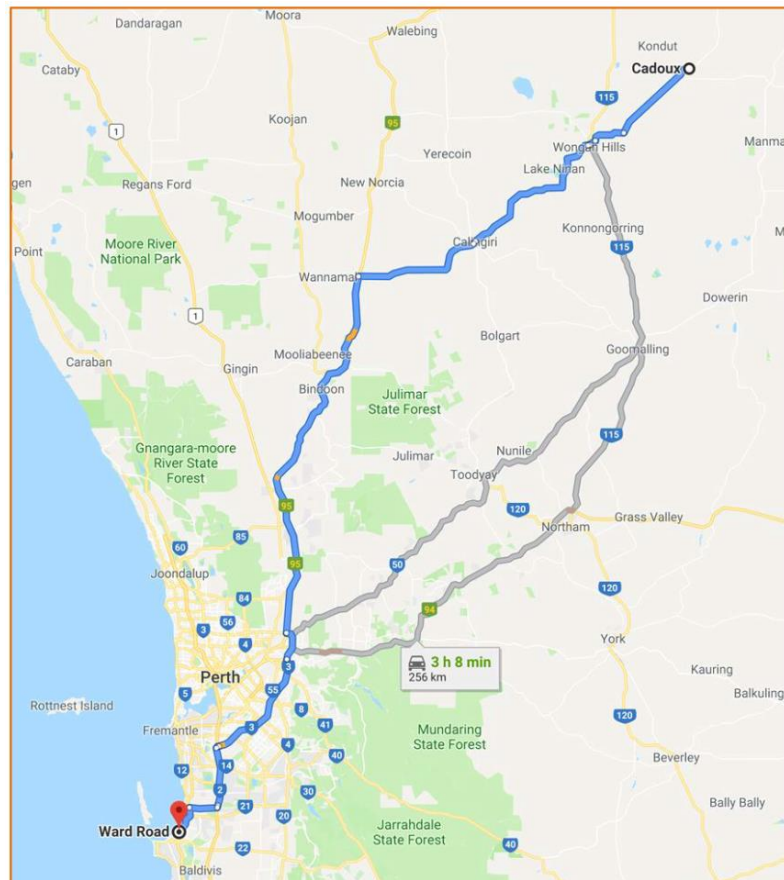
Introduction

- FYI Resources Ltd (FYI) is an ASX listed company, with 100% interest in the Cadoux Kaolin HPA Project in Western Australia. The project contemplates a kaolin mine at Cadoux and a HPA refinery plant in Kwinana, as well as associated infrastructure, to produce high purity alumina (HPA).
- The company has recently announced a MOU with Alcoa Australia, with a view to establishing a JV, which would represent strong validation of the Cadoux project as well as offer potential financing flexibility, and follows fast from its DFS earlier in 2020. The company is working towards FEED and FID of the Cadoux Kaolin HPA Project in CY21e, including finalising financing and marketing arrangements with formal offtake agreements.

CADOUX KAOLIN PROJECT (100% INTEREST)

- The Cadoux Kaolin Project is located ~220km north-east of Perth in Western Australia. The mine has good access to an existing road network from its Cadoux site; the company has nominated a route via Wongan Hills using the Great Northern Highway and Roe Highway to access its proposed Kwinana processing site.

Figure 1: Cadoux Project Location



Source: Company.

**CADOUX RESOURCE – MASSIVE, HIGH GRADE RESOURCE**

- The estimate of the JORC Mineral Resource at Cadoux stands at 11.3Mt at 22.5% Al₂O₃. A majority of the Resource falls in the Measured (481kt or 4%) and Indicated (5.7Mt, 51%) categories, with the balance in the Inferred category. The Resource has the potential to support a 175-year mine life (inclusive of non-mining periods) should it be completely converted into Reserves, based on a 60ktpa ore mining rate.

Figure 2: Cadoux JORC Mineral Resource

Category	Mt	Al ₂ O ₃ , %	Fe ₂ O ₃ , %	K ₂ O, %
Measured	0.481	23.56	1.24	1.18
Indicated	5.743	23.36	1.19	1.09
Inferred	5.046	21.45	0.59	0.91
Total	11.269	22.51	0.92	1.02

Source: Company, March 2020.

CADOUX RESERVE – 25-YEAR PROJECT LIFE REQUIRES ONLY 47% OF RESERVE

- The updated Ore Reserve for Cadoux stands at 3.2Mt at 24.8% Al₂O₃, 1.1% Fe₂O₃, 0.5% K₂O, and 0.9% TiO₂. We estimate that less than half (47%) of the Reserve at Cadoux is sufficient to support a long-life project of 25 years as contemplated by the DFS; moreover, we note the entirety of the Reserve could comfortably support a 55-year project life, assuming an average 60ktpa ore mining rate.
- We distinguish between the DFS project life, which is intentionally limited to 25-years, and contrast this with the 55-year mine life based on the Reserve, should the 60ktpa ore mining rate be maintained continuously.

Figure 3: Cadoux Ore Reserve

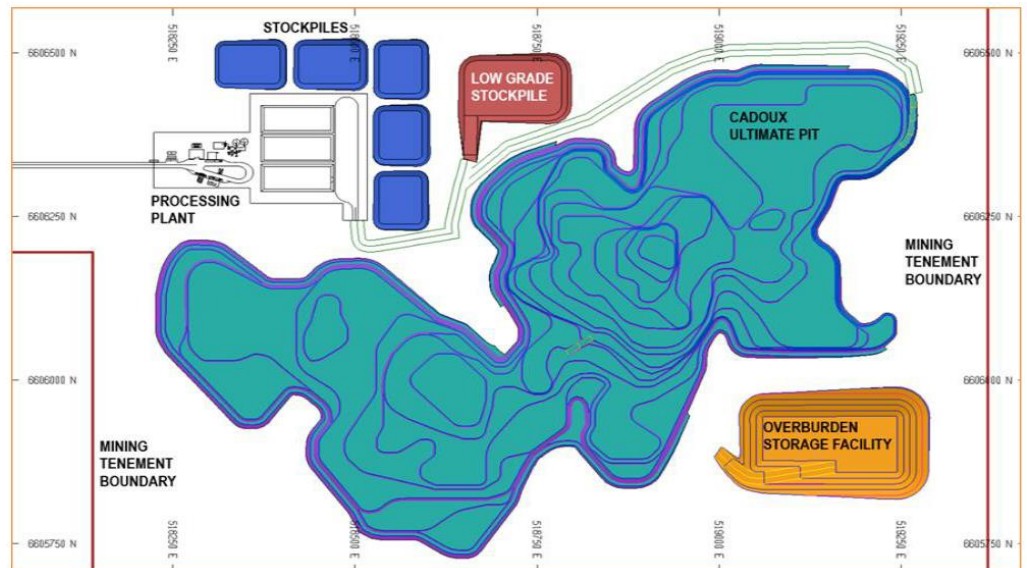
Category	Ore, kt	Al ₂ O ₃ , %	Fe ₂ O ₃ , %	K ₂ O, %	TiO ₂ , %
Proved	290	24.9	1.1	0.5	0.8
Probable	2,914	24.8	1.1	0.6	0.9
Total	3,205	24.8	1.1	0.5	0.9

Source: Company, March 2020.

CADOUX PROJECT OVERVIEW

- Geology – shallow and flat-lying:** the project area is underlain by weathered granitoid Archaean rock of the Yilgarn Granites, the likely parent material for the kaolin. Deep weathering of the felspathic and ferromagnesian minerals within the metamorphosed granitic has resulted in the formation of kaolinite. Granitoid fragmental rocks are occasionally present just below surface, although there is no outcrop. The overburden comprises gravel and sands over reddish to off-white clay. White kaolin underlies the overburden followed by weathered, partial oxidised and then fresh granitoids at depth.
- The weathering profile of the granitoid rocks suggests deeply weathered formation of a leached, kaolinised zone under a lateritic crust. Particle size distributions are typical of primary style kaolin clays produced from weathered granites. Overburden is to an average depth of 5m. White kaolin then averages approximately 16m before orange to yellow sandy and mottled clays are intersected, which are followed by recognisable rounded granitoid material. The thickness of the kaolin profile varies from less than 1m to a maximum 28m. Fresh granitoids are found at depths of 10m and 30m. All kaolin resources are within 4m to 11m of the surface.
- Exploration history – well defined by drilling:** The Cadoux kaolin deposit is well defined by drilling. A total of 4,177m of drilling has been completed from 199 holes, including 99 aircore, 97 RC, and 4 diamond drill holes. The most recent round of drilling was completed in April 2019. Intersected kaolin thickness ranges from 4m to 28m.

Figure 4: Cadoux Site layout

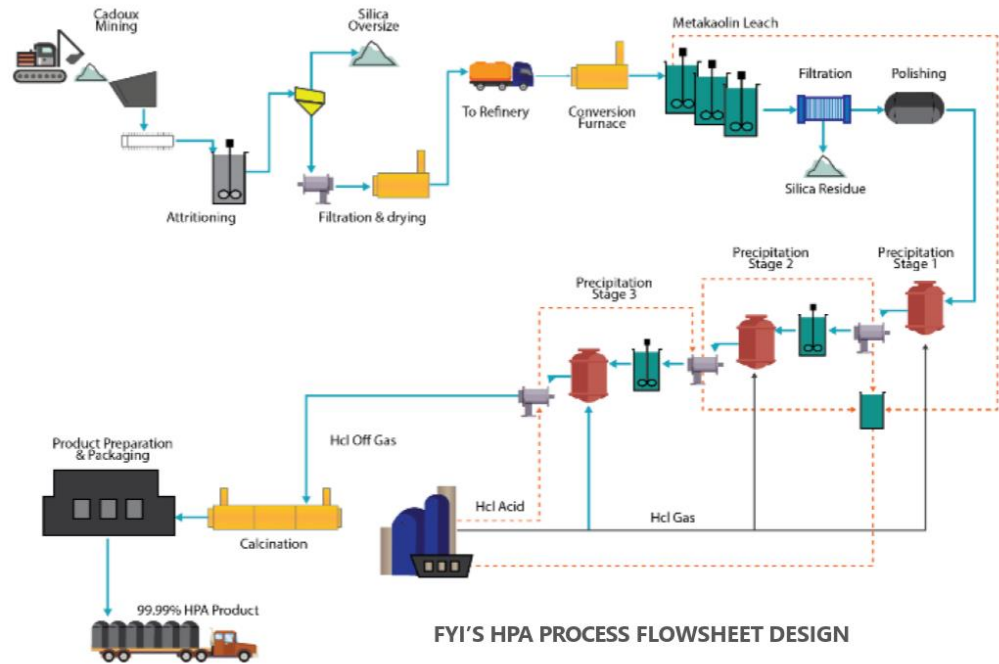


Source: Company.

- Mining – free dig, open pit campaign mining:** Mining at Cadoux will be conventional open pit, due to the shallow depth of the orebody and suitability for free dig and hard ripping. No drill and blast mining will be required, while backfilling will be utilised to minimise disturbance footprint. Overburden will be removed by excavators until the orebody is exposed; exposed ore is mined with truck and excavator and hauled directly to mill or stockpiled (ROM) for future processing. Typical mining campaigns will average 500kt total material per campaign every three years. We estimate this is equivalent to an average annual 60kt ore mining rate.
- The company contemplates using contract mining and operating by campaign mining due to low tonnage requirements. Each campaign will typically last three months, and will generate sufficient inventory for three years of kaolin supply on ROM stockpiles.

- Beneficiation – simple scrub and screen for feedstock:** Cadoux ore will be beneficiated on site to produce aluminous clay feedstock, which will be transported to Kwinana for refining to HPA. The beneficiation process includes attrition scrubbing and screening to reject coarse silica (quartz). Beneficiated feedstock is filtered and dried, and then bagged for road transport for refinery processing. The DFS envisages 53,500tpa of ore will be beneficiated to generate 24,500tpa of aluminous clay feedstock for the Kwinana refinery.
- Transport:** transport of the beneficiated kaolin from the Cadoux mine to the proposed Kwinana refinery will be via existing road network. The company plans for total weekly capacity of 570t intermediate product using a B double combination with 68m³ capacity.
- Refining Processing – innovative flowsheet:** The kaolin clay feedstock is activated by calcining at 700°C for one hour and is converted to metakaolin. The metakaolin is then leached with hydrochloric acid at 80°C for a duration of three hours, resulting in an aluminium rich liquor. The leach liquor undergoes precipitation stages by sparging with hydrogen chloride gas to recover aluminium chloride. Calcination of the dried aluminium chloride at 1,200°C for four hours produces HPA product with 99.99% (4N) purity.

Figure 5: Cadoux Kaolin HPA Project Flowsheet



Source: Company.

- Marketing:** the DFS contemplates 593 20-foot and 334 40-foot containers are loaded from Fremantle port annually, with the bulk density of the final HPA product considered light and compacted bulk density of 0.444g/ml. Port service charges are for the use of Fremantle port. FYI is proposing a dedicated wharf services facility.
- Offtake:** the company is progressing negotiations for MOUs for product offtake agreements, and aiming to finalise initial MOUs in 1H CY21e.

**CADOUX MINE AND KWINANA HPA REFINERY DFS HIGHLIGHTS****Robust, high-margin economics from single source integrated HPA supply**

- The company released a DFS for its Cadoux mine and Kwinana HPA refinery in March 2020, and showcased a single source, integrated potential HPA producer with a robust, high margin project.
- The company derived a US\$543M post-tax NPV₁₀ with 46% IRR in its DFS for the Project, assuming US\$24,000/t HPA 4N price (FOB, ex-Fremantle) and 0.70 AUDUSD. Payback is estimated to be 3.6 years, including ramp up. The project is expected to deliver annual average EBITDA of US\$88M.
- The company made a number of observations about the market for HPA pricing in determining its price assumption. Discussions with a broad sample of potential customers in preliminary marketing (30 separate groups) indicated the price range for 4N HPA was between US\$22,000/t (China) and US\$37,000/t (South Korea). The company has made adjustments for differences between spot and contract pricing, manufacturing end-user versus trader, as well as different end market countries. We note the company's adopted pricing is conservative and at the low end of the observed ranges.
- Average annual production will be 8,000t HPA of 99.99% purity. Total Al₂O₃ recovery is 61%.
- The DFS envisages a low cost operation with C1 cost of US\$6,217/t HPA. The refinery processing cost makes up a clear majority of the C1 cost (A\$1,357/t ore); we estimate ~75% of the C1 cost is processing. Beneficiation (A\$43/t ore) is the next largest component of C1 cost, representing only 10%. Mining cost is an almost negligible component of the cost, due to the flat and shallow geology, and free dig open pit campaign mining.
- Capital expenditure is projected to be US\$189M, which includes a 15% contingency. Again, a vast majority of the capital expenditure (90%) will be for the Kwinana refinery, and the balance for the Cadoux site. Plant maintenance is 7% of capex or US\$14M, which will be required in the initial years of operation; sustaining capex is estimated at US\$4M. We note the attractive capital intensity of the project of US\$23,575/t.
- The company's key DFS parameters for its Cadoux Kaolin HPA Project are summarised below.

Figure 6: Cadoux Kaolin HPA Project DFS Financial parameters

Parameter	Unit	Value
NPV ₁₀ post tax	US\$M	543
IRR	%	46%
Payback period, including ramp up	yrs	3.6
Total Project Sales, initial 25 yrs, no escalation	US\$B	4.7
Total Project Operating Cash Flow	US\$B	2.4
EBITDA, annual average	US\$M	88
Capital Expenditure, incl. 15% contingency	US\$M	189
Capital intensity	US\$/t	23,575
C1 Costs, FOB Kwinana, LOM	US\$/t	6,217
Sustaining Capex	US\$M	4
Plant Maintenance, % of capex	%	7.2%

Source: Company.

**Figure 7: Cadoux Kaolin HPA Project DFS Mining and Processing parameters**

Parameter	Unit	Value
Project Life	years	25
JORC Resource	Mt	11.3
JORC Reserve	Mt	3.2

Source: Company.

Figure 8: Cadoux Kaolin HPA Project DFS Mining parameters

Mining	Unit	Value
Ore Mining Rate, average annual rate	ktpa	60
Mining Cost	A\$/t	3.85-4.85
Strip	x:1	1.8
Ore loss	%	10
Mining dilution	%	0

Source: Company.

Figure 9: Cadoux Kaolin HPA Project DFS Processing parameters

Processing	Unit	Value
Cadoux Beneficiation Rate	dtpa	53,500
Cadoux Beneficiation Cost	A\$/t ore	42.86
Transport cost, Cadoux to Kwinana	A\$/t intermediate conc.	55.49
Kwinana HPA Refinery Feed Rate	dtpa	24,500
Kwinana HPA Production Costs	A\$/t ore	1,357
Kwinana HPA production	tpa	8,000
Total Al ₂ O ₃ Recovery from Processing	%	61%

Source: Company.

PROJECT CAPEX AND FINANCING – A\$80M FUNDING COMMITMENT SECURED

Capital Expenditure

- Capital expenditure is projected to be US\$189M, which includes a 15% contingency. The majority of the capital expenditure (90%) will be for the Kwinana refinery, and the balance for the Cadoux site. The company has already obtained equity funding commitment of A\$80M to contribute to the project.
- The company contemplates debt funding for the remainder of the capex requirement, or ~A\$172M, and is considering a number of sources. The DFS assumes 8% financing cost.

Equity Funding Commitment of A\$80M Already in Place

- The company entered into an agreement in March 2020 with GEM Global Yield LLC SCS (GEM), a Luxembourg based private equity group for a strategic project development equity financing facility of up to A\$80M. The Equity Commitment is primarily directed towards the capital requirement of the HPA project and provides up to 30% of the US\$189M Cadoux Kaolin HPA project capex. The agreement is a staged facility at FYI's election. It is not intended to be a working capital facility and does not preclude other avenues of equity project finance.
- At its election, FYI can draw down on this facility by giving notice; GEM will then subscribe for FYI shares. The number of shares that can be issued is ten times the average daily traded volume in the fifteen days prior to the notice. The subscription price will be 90% of the average closing bid



price over the same period. FYI can elect to draw down at any time within the three-year period of the agreement; FYI can make multiple drawdown elections.

INFRASTRUCTURE

Nearby access to ports, road, labour, power

- Cadoux is located 220km north-east of Perth, and the project area has access to major arterial roads, rail, mains water, communications, and power within 1km of the project. Labour, utilities, services, accommodation, and transport are all considered accessible, with Perth approximately two hours' drive, while major regional town Wongan Hills is 60km from Cadoux.
- The proposed location for the HPA refinery is at the Kwinana Industrial Zone (KIZ) with access to port, roads, water, communications, and power, as well as labour and utilities.

PERMITTING, ENVIRONMENTAL, AND FISCAL ISSUES

- FYI holds exploration licence E70/4673 and mining licence M70/1388 on which the Cadoux mine is located. The company has obtained all primary environmental approvals; secondary approvals and environmental management plans will be targeted for the construction phase of the project.
- Royalties comprise WA State Government 2.5% royalty on the HPA revenue from the project.
- The Cadoux Kaolin HPA Project has a number of environmental advantages over the current traditional supply from alkoxide/bauxite via aluminium using the Bayer and Hall-Heroult processes. Processing from kaolin via its innovative flowsheet, the company estimates ~50% reduction in greenhouse gas production and ~40% reduction in processing energy consumption per tonne of HPA produced.
- The company also expects extensive recycling (in particular of leach acid), low toxic waste, and reduced raw material waste, as well as provenance authentication to provide strong environmental credentials for the project and its potential customers.

ALCOA – CREDIBLE PARTNER LIKELY TO OFFER FINANCIAL FLEXIBILITY

- The company announced in September 2020 that it had signed a MOU with leading alumina producer, Alcoa of Australia Limited (Alcoa) for potential strategic development of FYI's HPA refining technologies.
- The MOU will explore the possibility of the joint development of FYI's innovative and fully integrated HPA refining project for commercialisation, as well as the establishment of offtake customers into HPA markets. The MOU establishes a pathway to progress to a JV as well as potential financing options for the company, if FYI can leverage access to Alcoa's balance sheet.
- The joint pilot plant trials have now commenced to validate key operational parameters, explore scale up factors, review process refinements, and produce further material for marketing and qualification. Further HPA pilot plant variability trials will also be conducted, and if successful would catalyse progress in JV discussions between FYI and Alcoa.

**EARNINGS FORECASTS – MAIDEN EARNINGS IN FY23e**

- We provide forecast earnings for FYI in the figure below. We expect the first full year of production in FY24e to deliver \$94M in earnings, and a ramp up of production in FY23e at 30% of annual average production capacity (FYI DFS 70% ramp assumption).

Figure 10: FYI Earnings Forecasts, A\$M

Y/e June	2020a	2021e	2022e	2023e	1 st full yr	
					2024e	2025e
Revenue	0	0	0	76	256	261
Operating costs	3	3	5	25	72	73
EBITDA	-3	-3	-5	52	184	188
D&A	0	0	0	6	44	44
EBIT	-3	-3	-5	46	141	144
Net interest expense	0	0	5	6	6	3
PBT	-3	-3	-11	40	135	141
Tax expense	-1	0	0	12	40	42
NPAT underlying	-2	-3	-11	28	94	99

Source: Foster Stockbroking estimates.

SHARE CAPITAL AND BALANCE SHEET

- FYI has 300.8M ordinary shares on issue and 56.4M options, with strike prices of \$0.10 and \$0.15 and expiry July 2021 and March 2024, respectively.

Figure 11: FYI Share Capital

Share Capital	M
Fully paid ordinary shares, M	300.8
Options, M	56.4
Fully diluted shares, M	357.2

Source: Company.

- The company recently raised \$6M and has an estimated \$8M cash to continue pilot plant runs, offtake negotiation, financing discussions prior to FEED and FID; management are targeting FEED and FID in CY21e.

VALUATION – \$0.68/SHARE, RISKED

- We derive an unrisksed valuation of \$1,153M or \$1.05/share for FYI. Our valuation is based on an unrisksed NPV₁₀ DCF of \$770M for the Cadoux Kaolin HPA project. We estimate a 40% post-tax IRR for the project. Our assumptions are broadly in line with the company's DFS (see figures 6 to 9 above), with key departures arising from differences in currency, mine life, and financing assumptions.
- We assume long term AUDUSD of 0.75 (FYI DFS 0.70) and long term 4N HPA price of US\$24,000/t, in line with the company's DFS price assumption. We consider a 25-year project life in the base case. We also ascribe value for the potential extension of the project to a 55-year project, and which would utilise the whole Reserve at Cadoux (FYI DFS' 25-year life only). We further note the massive Resource supports a much longer project life than considered by the DFS but the company has not considered or ascribed any value to this further extension. We have risked the Cadoux extension value by 40% in the risked valuation case. We model a twelve-month ramp,



producing 30% LOM annual output in FY23e (FYI DFS' 70% assumption in initial project year). We assume first full year of production in FY24e.

- We assume financing is drawn from a number of sources. First, we assume the existing A\$80M equity facility is fully drawn, at 10% discount to the current share price. Secondly, we assume that 40% of the US\$189M capex, or A\$100M, is in the form of debt financing at similar terms assumed in the DFS. We assume a further equity capital requirement of A\$71M for the remainder of the capex, also raised at a 10% discount to the current share price, similar to equity commitment terms. We assume a fully diluted share number of 1,100M for our valuation.
- We note the company's DFS presented a post-tax NPV₁₀ of US\$543M, assuming long term US\$24,000/t HPA price and 0.70 AUDUSD.

Figure 12: FYI Valuation

Company Valuation	Unrisked		Risky		Risk Factor
	A\$M	A\$/sh	A\$M	A\$/sh	
Cadoux	770	0.70	539	0.49	70%
Cadoux expansion	277	0.25	111	0.10	40%
Corporate	-60	-0.05	-42	-0.04	70%
Cash (debt)	8	0.01	8	0.01	100%
Cash, equity facility (GEM)	80	0.07	80	0.07	100%
Cash, equity raise	71	0.06	49	0.01	70%
Options	8	0.01	6	0.01	70%
Valuation DCF, WACC 10%	1,153	\$1.05	\$751	\$0.68	65%
Ordinary shares, M	301				
Options, M	56				
Shares, future issue, M	743				
Fully diluted shares, M	1,100				

Source: Company, Foster Stockbroking estimates.

SENSITIVITY ANALYSIS – LONG TERM HPA PRICE AND CURRENCY KEY FACTORS

- Our valuation of FYI is most sensitive to ultimate price assumptions. For a US\$1,000/t increase in the long term HPA price, there is a corresponding 5c increase to our unrisked FYI valuation to \$1.05/share, or corresponding 3c increase to our risky FYI valuation.
- For a 5c change in AUDUSD, there is a corresponding 7c change to our unrisked FYI valuation to \$1.05/share, or corresponding 4c increase to our risky FYI valuation.

FURTHER UPSIDE POTENTIAL – CADOUX HPA PROJECT ECONOMICS STAND ALONE

- We see a number of drivers for further value, including the following:
 - **Cadoux mine life extension.** We note the DFS considers a project life limited to 25-years only, which represents 47% of the Reserve, and contrast this to a potential mine life of 55 years if the total Reserve is mined at the existing ore mining rate of 60ktpa. The Resource is ample and has the potential to support a 175-year mine life, if Resource is fully converted to Reserve.
 - **Production capacity upgrade.** We note the DFS contemplated an 8,000tpa HPA project, which we think could be upgraded in an orderly fashion, particularly in light of a looming supply shortfall.
 - **By product revenue.** The company has intentionally omitted high purity quartz (HPQ) by-product at both Cadoux and Kwinana.

**PEER COMPARISON – CADOUX’S ATTRACTIVE ECONOMICS AGAINST PEERS**

- We present a peer comparison of ASX listed HPA developers in the figure below. We note FYI compares favourably with its developer peers on a project basis, as well as valuation basis.

Figure 13: FYI peer comparison

Name	Code	Mkt Cap A\$M	Project	Stage	LOM, yrs	NPV, US\$M	Capacity, tpa	Capex, US\$M	Opex, US\$/t	EBITDA, US\$M
Alpha HPA	A4N	208	Gladstone	DFS	n/a	nd	10,000	209	5,940	191
Altech Chemicals	ATC	36	Meckering/Johor	Constr	30	505	4,500	298	9,900	76
FYI Resources	FYI	68	Cadoux/Kwinana	DFS	25	543	8,000	189	6,217	133

Source: Companies, Foster Stockbroking estimates.

- FYI has the lowest expected capital expenditure of US\$189M of its ASX peers, as well as the most attractive NPV of US\$543M compared to its developer peers. It has a low operating expenditure of US\$6,217/t, and compares favourably to A4N’s, which includes by-product credits. FYI’s annual average EBITDA is peer leading, and also superior to A4N after accounting for price assumptions and capacity difference.

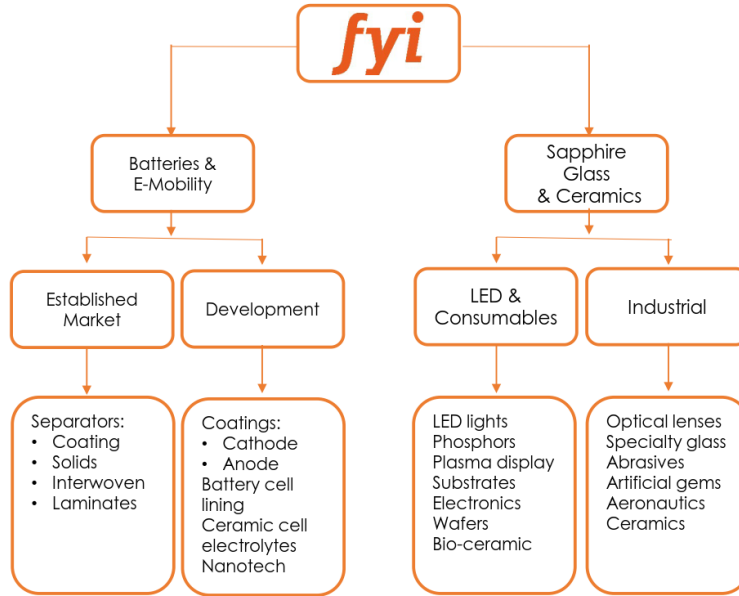
INITIATE WITH BUY RECOMMENDATION, PRICE TARGET \$0.68/SHARE

- We initiate coverage of FYI with a Buy recommendation and price target of \$0.68/share, in line with our risked 0.65x NPV valuation. We consider the Cadoux HPA Project is an integrated, high-margin project supported by a very long life asset with compelling economics, offering supply provenance wholly from a tier one jurisdiction, leveraged to exciting demand growth for its principal product as a result of the re-emerging EV market.
- We see a number of upcoming catalysts for FYI, including 1) FEED and FID decisions and commencement of the Cadoux HPA project; 2) customer offtake MOUs and marketing relationships; 3) updates on financing arrangements; 4) updates on the Alcoa JV; and 5) updates on LOM extension, capacity upgrade, and/or by-products.

APPENDIX – HIGH PURITY ALUMINA MARKET OVERVIEW

- High purity alumina (HPA) is an aluminium oxide (Al₂O₃) with a purity of at least 99.99% (**4N** or **4 nines**) and has many applications in the manufacture of high technology products. HPA has desirable properties including high brightness, superior hardness, and superior corrosion resistance. HPA has widespread application including in LED bulbs, semiconductor substrates, lithium ion batteries, optical lenses, biomedical devices, and others.

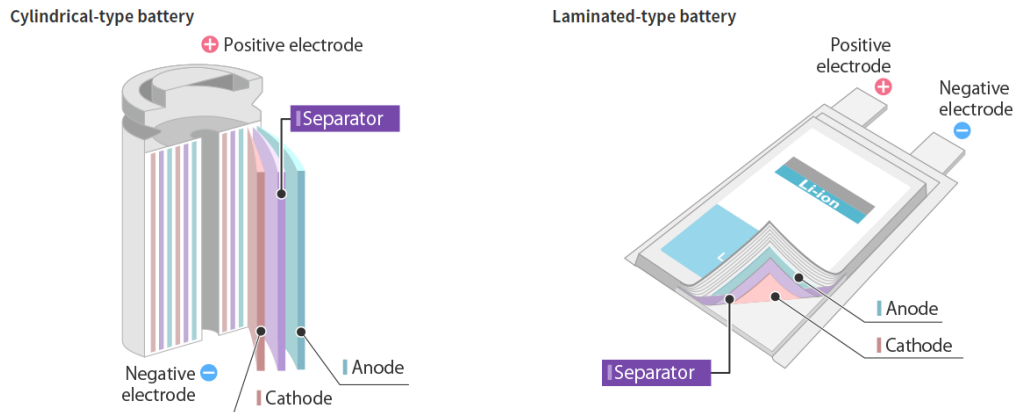
Figure 14: HPA applications



Source: Company.

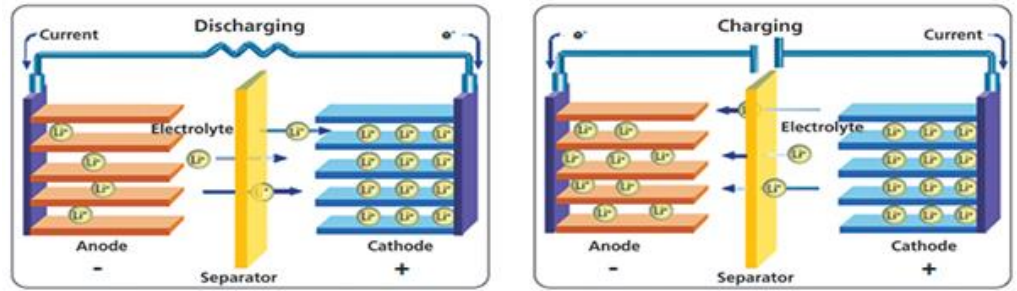
- HPA applications in high tech product manufacturing fall into two broad categories. Traditional HPA applications include light emitting diodes (LED), plasma screens, artificial sapphire glass screens (e.g. in TVs, tablets, smartphone screens, electronics, and aeronautics). The growing segment of HPA application are in battery and power storage applications, which include use in lithium ion batteries (LIB), static power cells (power walls), and rechargeable batteries.

Figure 15: Lithium Ion Batteries in cross-section, cylindrical and laminated types, with separator



Source: Teijin.

Figure 16: Battery Charge/Discharge Cycle, with Separator



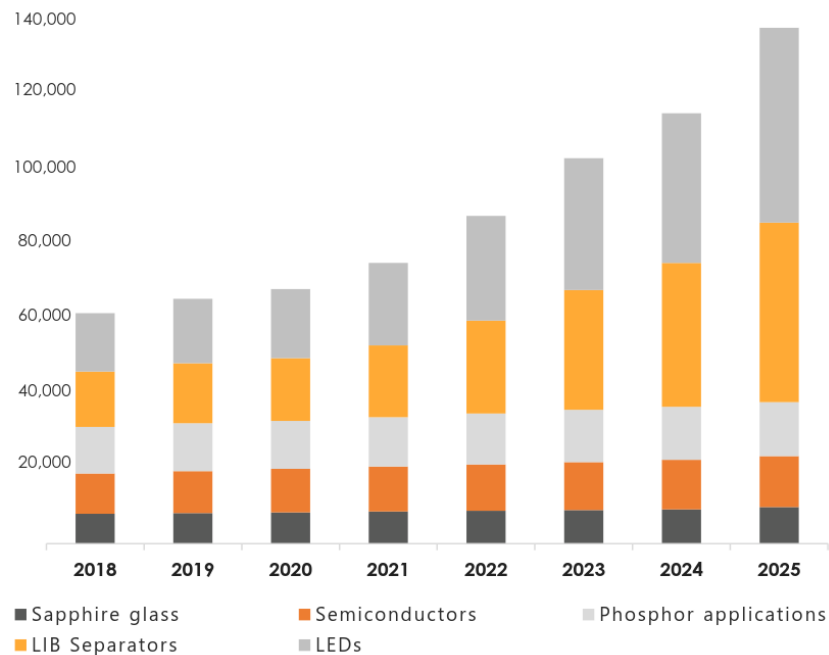
Source: TechSci Research.

- HPA demand is expected to benefit from its superior properties as a separator coating in LIBs, including better performance, increased safety, and longer battery life. HPA can be used to coat separators in LIBs, which act as a partition between the anode and cathode in the battery cell. Ideal specification requirements for separators include maintaining thermal stability, while allowing the flow of electrolyte ions. HPA coated separators significantly improve separator performance, especially for maintaining thermal stability under very high operating temperature environments, which ultimately reduces the risk of battery fires.

Demand – EV Growth to Drive Increased Demand from LIB Separators

- Forecast demand for HPA is expected to grow significantly over coming years. The current global demand for 4N HPA is ~65,000t and expected to increase approximately four times to 270,000t by 2028 (CRU). Demand for HPA is expected to grow rapidly at CAGR of 17% to 2028 (CRU). Similarly, Allied Market Research forecasts the HPA global market to increase from ~35,000t in 2018 to 145,000t in 2026.

Figure 15: HPA Demand Outlook, tpa

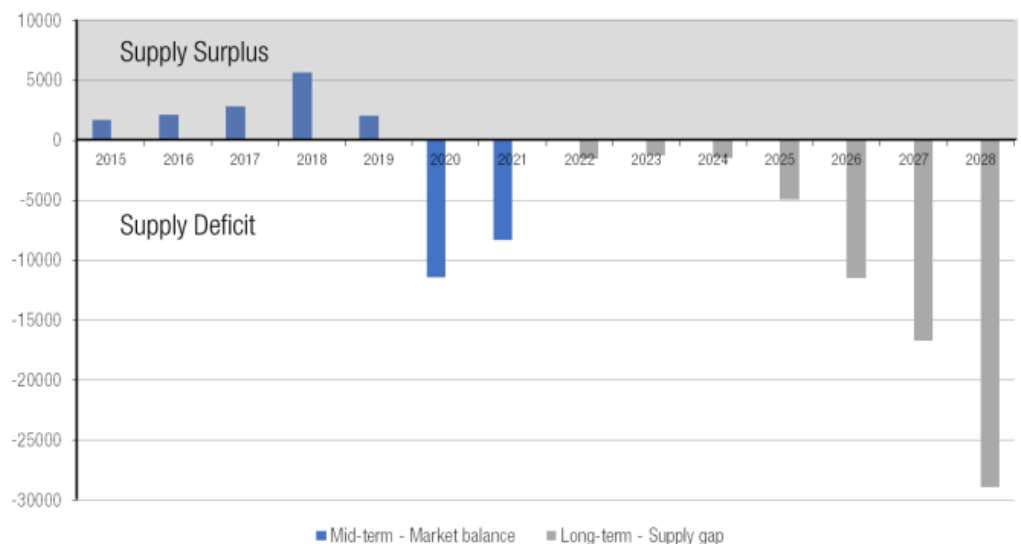


Source: CRU, company.



- Demand for 4N HPA accounts for the largest share of HPA market demand. Increased demand from a wide range of applications such as LED bulbs, LIB separator coating, electronic displays, automotive, and medical applications, in particular are expected to drive robust forecast CAGR.
- LEDs currently account for the largest share of HPA demand (~20,000tpa) of global demand; demand for HPA in LEDs is expected to reach 85,000tpa by 2028 (CRU) as LED penetration increases while old inefficient lighting is phased out.
- The other main driver of expected HPA demand growth comes from LIB separators. The main determinants for increased HPA demand are adoption of HPA coating for separators, increased cylindrical, prismatic, and polymer separator market share, increased cell volumes, all of which are driven by EV sales growth. CRU forecasts outstanding growth in the LIB separator market at 49% CAGR from 5,000t in 2018 to 80,000t in 2025.
- LIB separators have been the fastest growing sector by end use demand in recent history, and had grown at CAGR 25.7% to 5,000t by 2018. LIB separator growth is expected to account for a growing share of the market in the near term, and is expected to have its main driver in the form of EV sales growth. It is expected that cylindrical separators will grow strongly at 29% CAGR, and to gain market share of separators to 87% by 2025, from the current 64% share.
- The average cell volume of batteries is also growing, as LIBs tend more towards EVs rather than consumer handheld electronics. HPA coated separators are forecast to increase to 69% of market share by 2025 from 21% of the current market.
- LIB separator growth will ultimately be driven by the growth of EVs; up to 5kg of HPA is required in each EV (CRU). Global EV sales are forecast to grow at 26% CAGR to 2030 from 2018 (IEA). A number of government policies have been designed to incentivise EV adoption. China has a target for 25% of new cars to be EVs by 2025. The UK, Italy, and France have each announced a prohibition on sale of gasoline and diesel vehicles by 2040. Governments including in Germany, Denmark, Israel, Ireland, and Slovenia have planned 100% zero emission sales by 2030.

Figure 16: 4N+ HPA Market Balance and Supply Gap, tonnes



Source: CRU.



- CRU expects deficit in the 4N+ HPA market balance in both the near term and long term. The reversal of the near-term deficit is expected to be from a number of HPA projects expected to come online. By 2028, CRU expects a shortfall of ~30ktpa or ~4x the annual capacity of Cadoux.

Supply – in relative balance now, forecast deficit gap to grow again from 2025

- The majority of HPA production is sourced from the Asia Pacific region. Total HPA production in 2019 was ~65,000t, broadly matching demand. China accounts for the majority of production at ~55%, although much of it is a lower quality 3N product, which supplies the budget electronics market. Other material producers include Japan (~15%), North America (~10%), and South Korea (~10%).

Pricing

- The broad applicability of HPA in various manufacturing processes means product characteristics and profiles are critical in determining HPA pricing. The following factors are notable:
 - **Opaque market:** no recognised benchmark price for HPA, with product quality also critical to pricing. Limited number of producers in the market, with a majority operating privately.
 - **Product heterogeneity:** distribution of impurities, physical characteristics, and supply consistency are factors determining product pricing.
 - **Product specifications:** product specifications are highly dependent on end use application, and are priced accordingly.
 - **Two-tiered markets:** HPA product for sapphire substrates in LED manufacturing has evolved to be generally supplied by 3N product as producers seek to lower costs as a result of intense competition, which has resulted in a two-tiered markets for HPA in LED production, especially prevalent in China.



BOARD OF DIRECTORS AND KEY STAFF

- **Edmund Babington, Non-Executive Chairman.** Director of WA commercial law firm, Lyons Babington Lawyers. Experienced in franchising, mining and resources, and corporations law with specialist expertise in capital raisings, stock exchange requirements, corporate governance, and compliance. Other recent directorships include Hawkley Oil & Gas Ltd and Empire Resources Ltd.
- **David Sargeant, Non-Executive Director.** BSc. More than forty years of experience as a geologist, consultant, and company director. Previous experience includes senior geologist at Newmont Ltd, senior supervisory geologist Esso Australia Ltd including the Harbour Lights Gold mine discovery and development. First chief geologist at Telfer gold mine. Exploration manager at Adelaide Petroleum NL manager of resources development for Sabminco NL and technical director of Western Reefs Ltd. Formerly Managing Director of Empire Resources Ltd.
- **Adrian Jessup, Non-Executive Director.** BSc. More than forty years of experience as a geologist, company director, and consultant involved in mineral exploration, ore deposit evaluation, and mining. Prior experience includes operating a geological consulting company, and founding director of Empire Resources Ltd and Sylvania Resources Ltd, as well as managing director of Giralia Resources NL, and senior geologist for AMAX Exploration Inc. Other recent directorships include Empire Resources Ltd.
- **Roland Hill, Managing Director.** BSc., BCom. More than eighteen years of experience in the mining and exploration sector, and was appointed CEO in 2011, and Managing Director in 2014. No other recent directorships.

RISKS

The following risks may negatively impact the valuation and earnings of FYI:

- **Resource risk.** There is a risk that in the future resources may be negatively revised, impacting the size and quality of the projects.
- **Sovereign risk.** Any change in government, policy, legislation, or fiscal regimes of Australia, might impact the ownership, financing, permitting, or economics of FYI's business and valuation.
- **Commodity price and currency risk.** Commodity price declines may negatively impact revenues and profitability of FYI's project. FYI's share price is denominated in A\$, while its commodities are priced in US\$. Any increase in the A\$ may reduce translational impact of US\$ into A\$.
- **Operating risk.** Operational issues can occur during the mining, processing, transporting, and selling of the product that has the ability to impact revenues, costs, and profit negatively.
- **Financing and dilution risk.** FYI is not currently generating earnings, and requires funds to advance its project. If the company is not able to source the requisite funding, it might require highly dilutive equity raising and/or debt that has the potential to dilute shareholders or increase the company's solvency risk.
- **Management risk and key person risk.** The loss of key executives may cause the performance of the business to deteriorate and a loss of investor confidence.
- **Economic risk.** Any downturn in economies in which FYI operates could cause lower revenue and earnings for FYI. Slowing economic growth globally may negatively impact FYI's earnings.



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Disclosure review. All the disclosures in the report have been reviewed and checked by Keith Quinn, Compliance Committee Member.