

**Overweight**  
Price Target:  
AU\$3.00

## **PYX Resources: Improved Financial and Operational Metrics amid COVID-19 Pandemic; Reiterate Target Price**

### Introduction

PYX Resources Limited (“PYX” or “Company”) has the second-largest JORC-compliant zircon resources in the world among zircon producing companies and is listed on the National Stock Exchange of Australia (NSX: PYX). Moreover, being a leading and rapidly-growing premium zircon producer, it has tremendous potential for output increase and profitability enhancement.

This report provides an update on PYX’s recent developments together with a review on its financial and operational metrics for the first six months of 2021 ended on 30 June 2021 (1H 2021).

### Recommendation Summary

- a) We continue our coverage of PYX and reiterate the **Overweight** rating and **12- to 18-month price target of AU\$3.00**, representing an upside potential of about 135% over its closing price of AU\$1.279 as of 13 September 2021.
- b) On 2 September 2021, PYX announced its 1H 2021 results, with **sales volume increasing 14%** over 1H 2020, stemming from robust demand and **production growing 25%**. Importantly, the Company’s **premium zircon price increased by US\$355 per tonne to US\$1,750 per tonne**, as overall demand flourishes, while industry supply tightens amid the COVID-19 pandemic;
- c) In our view, PYX is positioned to capture future growth of the premium zircon market due to **successful fundraising through the US\$8.4 million (before fees) share placement** to professional and sophisticated investors to fund continued production capacity expansion and activities to extend mine life so that it can satisfy anticipated growing demand going forward;
- d) Significant ongoing enhancement in financial and operational metrics, leading to further loss reduction and eventually becoming a profitable company. In 1H 2021, PYX’s **both EBIT and EBITDA showed a remarkable improvement of over 80%** over the corresponding period in 2020 to merely around -US\$1.35 million and -US\$1.25 million respectively;
- e) **We believe outlook for the mineral sands industry in general and zircon in particular remains burgeoning** due to the following factors: 1) long-term demand is likely sustained by global economic growth, which is expected to continue its uptrend; 2) increasing urbanization especially in China and India; 3) new applications arising from technological breakthroughs in areas such as nano-materials and nano-structures; and 4) non-existent of notable discovery of zircon deposits in recent years that could lead to further shortage in supply. Although the COVID-19 pandemic has dampened short-term demand to some extent, **full recovery is expected within the next 12 months**, as effective vaccines have been administered worldwide, heightening expectations for normalization of global economic activities.



Share Price (as of 13 Sept 2021):  
AU\$1.279  
12- to 18-month Target Price:  
AU\$3.00

Market Cap (as of 13 Sept 2021):  
AU\$549.4M  
Total Shares: 429.5 M\*  
Dividend and Yield: N/A

Notes: Unless otherwise denoted, a US\$:AU\$ exchange rate of 0.75:1 is used in all calculations in this report. \*After accounting for shares issued related to the acquisition of Tisma and the share placement.



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## I. ENCOURAGING OPERATIONAL UPDATES WITH MULTIPLE ACHIEVEMENTS

### 1.1 Entering into Offtake Agreement and Supplying Zircon for High-Tech Applications

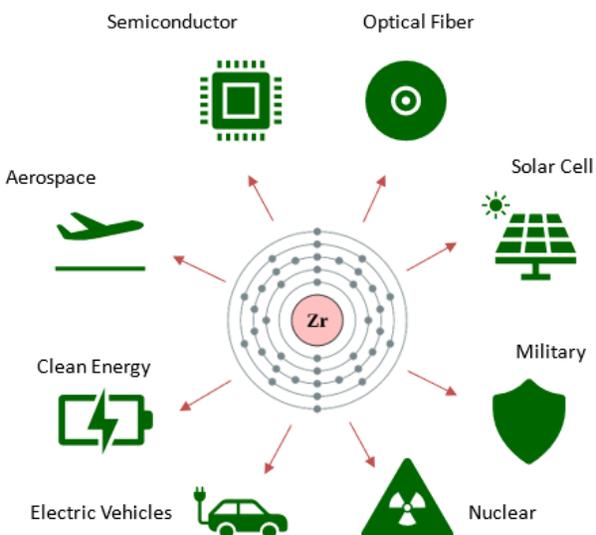
Demand continues to rebound to pre-pandemic levels, with customers showing particular interest in PYX’s premium zircon due to its superior quality.

In March 2021, the Company announced that it had entered into a two-year binding Offtake Agreement for supplying a total of 3,600 tonnes of zircon to India-incorporated Microtech Zircon, a member of Delta Tiles, which is a group of companies affiliating with the brand name Geo Gres. On 27 April 2021, PYX also announced that it had secured new business with Fujian Sanxiang Advanced Materials Co., Ltd. (“Fujian Sanxiang”), a leading producer of fused zirconia based in China, enabling the Company to enter the fused zirconia market and expand its presence in the largest zircon-consuming country globally.

Production of fused zirconia needs premium zircon, as standard zircon does not meet the stringent requirements. Since PYX’s premium zircon has low content of aluminum oxide of below 0.2% and only a minimal level of uranium and thorium content in the amount of less than 450 parts per million (“ppm”), it is ideal for producing fused zirconia.

Having the combination of several unique attributes, including very high melting point, chemical stability at high temperatures, sturdiness, corrosion resistance alongside high refractive index<sup>1</sup>, end products of fused zirconia are deployed in a wide variety of high-tech applications in growing industries such as nuclear power and aerospace. In addition, fused zirconia is used for producing high-end zirconium metal products for a variety of cutting-edge technology applications, including electric vehicle batteries, technical ceramics, electronics, and defense. Thus, fused zirconia will serve as another growth driver for the Company.

#### Exhibit I-1: High-Tech Applications of Premium Zircon



Source: Cedrus

<sup>1</sup> Refractive index is a measure of how light propagates through a material. The higher the refractive index the slower the light travels, which causes a correspondingly increased change in the direction of the light within the material

As continued technology advancements make better products and enhanced services commercially viable, high-tech applications using zircon will gain popularity over time, fueling additional demand for the mineral and benefitting PYX.

## 1.2 COVID-19 Response and Status

COVID-19 pandemic has become a crisis for many mining companies. However, it is not the case for PYX because the Company has responded quickly by taking great care of its staff, contractors, and the communities it works with to assure preventive measures are put in place.

### Exhibit I-2: COVID-19 Status at PYX



Source: PYX

As of the date of this report, PYX has reported no confirmed cases of COVID-19 at either its operations or offices, as well as no disruption to its production.

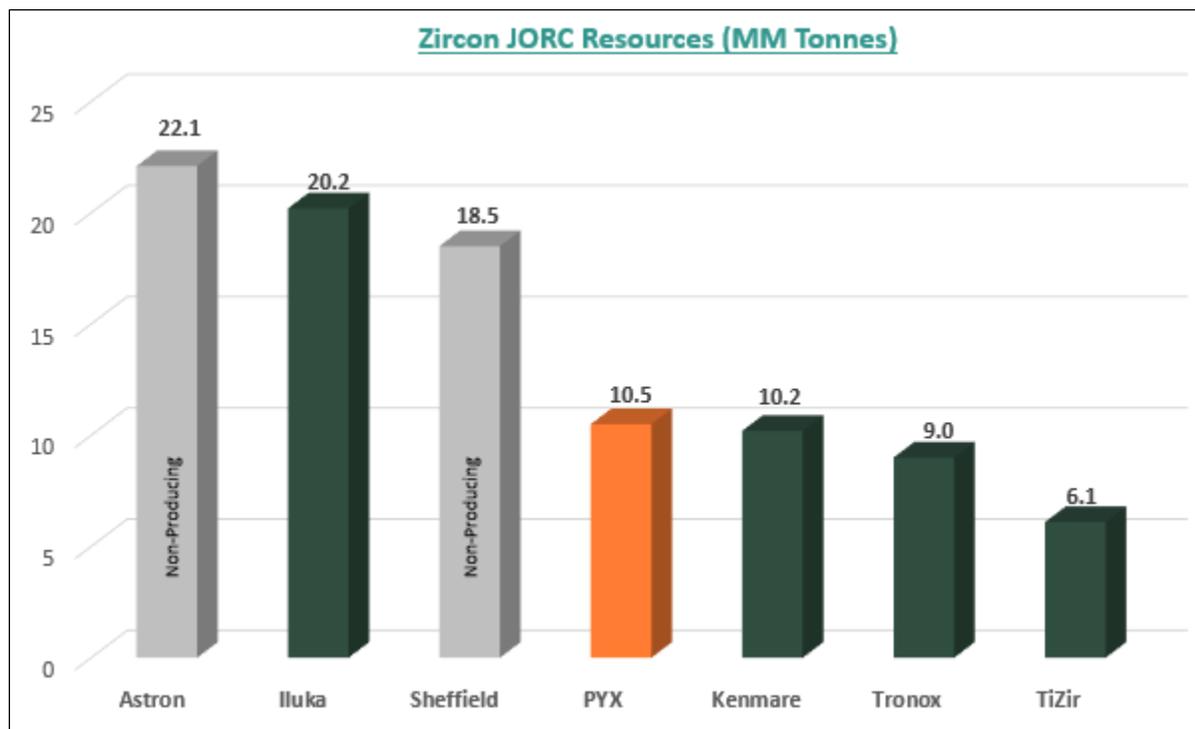
## 1.3 Completion of Tisma Acquisition

In February 2021, the Company completed the acquisition of Tisma Development (HK) Ltd. (“Tisma”). PYX acquired the entire share capital of Tisma via the issue of 147,277,370 PYX shares. The acquisition has brought about the following benefits: 1) boosting the scale of the Company’s activities; 2) adding 137.2 million tonnes of mineral resources along with 4.5 million tonnes of contained zircon to PYX’s resources; and 3) achieving a milestone in the consolidation of the mining business regarding mineral sands in Indonesia.

Tisma controls a world-class mineral sands deposit situated in a concession area covering 1,500 hectares in Central Kalimantan, Indonesia. Additionally, Tisma is fully licensed with an IUP-OP permit, allowing mining, production and export of zircon.

Besides being an accretive acquisition and creating significant synergy to the Company, the deal has helped PYX become the entity with the world’s second-largest zircon resources among zircon-producing companies. PYX now controls in aggregate 263.5 million tonnes of JORC-compliant mineral resources with 10.5 million tonnes of contained zircon.

**Exhibit I-3: Ranking of Zircon Resources (JORC-compliant, in Million Tonnes) by Companies**



Source: Companies' public filings

The Company also raised US\$8.4 million (before administrative, legal and placement fees) in June 2021 to principally accelerate the development of Tisma's zircon-rich tenement in Indonesia such as investing in its in-house mining along with building a mineral separation plant as well as the required investment in logistics.

## II. IMPROVED FINANCIAL POSITION AND CORPORATE FINANCE ACTIVITIES

### 2.1 1H 2021 Financial Performance Review

During 1H 2021, PYX sold 3,250 tonnes of premium zircon. Sales volume showed a strong growth of 14% over the same period in 2020, leading to a persistently tight finished goods inventory. During the same period, PYX produced 3,501 tonnes of premium zircon, resulting in a year-on-year increase of 25%.

Latest half-yearly results revealed that underlying EBITDA was improved to only a negative US\$661k, an achievement versus the comparable period in 2020 of negative US\$716k. Similarly, EBITDA was reduced to a negative of US\$1,255k against a negative EBITDA of US\$10,606k in 1H 2020. Continued tight cost controls and the absence of listing costs were the contributing factors for the remarkable financial performance.

PYX recorded a net loss after tax of US\$1,194k in 1H 2021 versus a net loss of US\$10,589k from the previous corresponding period, while loss after income tax and other comprehensive income was US\$1,135k, compared with loss of US\$10,555k for the period ended on 30 June 2020. The improvements are due to the 21% increase in revenue on higher sales volume and elevated average selling price despite the COVID-19 pandemic.

Not only remains debt free but also with a cash balance at the end of the reported period of US\$9.7 million, up US\$6.2 million from last year's corresponding period, attributable mainly to the proceeds from the private share placement of US\$8.4 million (before fees).

#### Exhibit II-1: Summary of Key Financials for PYX

	Half Year Ended 30 June 2021	Half Year Ended 30 June 2020	Change	Change
	US\$	US\$	US\$	%
Zircon sold (tonne)	3,250	2,851	399	14%
Zircon produced (tonne)	3,501	2,801	700	25%
Revenue	4,660,223	3,861,269	798,954	20.69%
Cash Cost of Production	4,008,639	3,097,979	910,660	29.40%
EBITDA	-1,254,832	-10,605,899	9,351,067	88.17%
EBIT	-1,346,969	-10,655,299	9,308,330	87.36%
Net loss before tax	-1,352,830	-10,673,767	9,320,937	87.33%
Net loss after tax (NLAT)	-1,194,190	-10,588,668	9,394,478	88.72%
Total comprehensive loss	-1,134,608	-10,554,521	9,419,913	89.25%
Underlying EBITDA	-660,567	-715,759	55,192	7.71%
Cash	9,717,641	3,509,395	6,208,246	176.90%
Total Assets	86,971,936	6,166,204	80,805,732	1,310.46%
Total Liabilities	2,262,179	1,645,355	616,824	37.49%
Short- or Long-Term Debts	0	0	0	-

Source: PYX

## 2.2 Successful Fundraising

With strong investors' support, the Company successfully closed a private share placement to professional and sophisticated investors in June 2021, raising US\$8.4 million (before fees) for which around 10.9 million new, fully-paid ordinary shares of PYX were issued.

The fundraising will be sufficient to finance the capital expenditure program and provide working capital for Tisma to ramp up its output of 65.5 grade premium zircon. This is critical in ensuring that PYX remains competitive by meeting customers' heightened demand and maintaining its sustainable growth without concerns about immediate resource depletion.

## 2.3 Exploring Possibility of a Dual Listing on the Main Market of the London Stock Exchange

PYX announced on 25 May 2021 that it is exploring the possibility of dual listing its ordinary shares on the Main Market of the London Stock Exchange ("LSE"). The move was triggered by increased interest from European family offices and institutional investors in owning a stake of PYX and the likelihood of giving PYX's share price a boost. A financial adviser and a broker have been appointed in connection with the potential LSE Listing.

A Listing on the LSE, if approved, would make it easier for European investors to participate in the growth of the Company and enhance the liquidity of PYX's shares.

### III. FAVORABLE MARKET CONDITIONS POST COVID-19 PANDEMIC

#### 3.1 Analysis of Zircon Price Trend

During 1H 2021, zircon price experienced a significant gain as a result of strong demand and restricted industry supply due to disruptions caused by the COVID-19 pandemic. This is reflected in the increase of the weighted average price free on board (FOB) for premium and standard zircon in the period to US\$1,321 per tonne (up 2% from 2H 2020) after a US\$70 per tonne price increase took effect from 1 April, 2021 as reported by Iluka Resources Ltd. (ASX: ILU), the global leading mineral sands producer.

Likewise, PYX raised its premium zircon price three times (in March, May, and June) during the first six months of 2021 by a total of US\$355 per tonne to US\$1,750 per tonne. The price increases reveal the expectations that there will not be substantial new premium zircon supply entering the global market in general and the very strong increase in demand, particularly from China.

The zircon pricing environment is expected to remain robust in the medium and long term on the assumption of worsening supply constraints. As China's economy continues to expand albeit at moderated rates and European economies recover from the pandemic, supply shortages should become more acute. Moreover, amid the global megatrend of switching to green energy, premium zircon, such as PYX's, will be even in greater demand for the manufacturing of fused zirconia and other products where standard zircon cannot be used. As mentioned before, fused zirconia is deployed in applications associated with batteries for electric vehicles, solar cells, and semiconductors. These products are crucial for the world to tackle the climate change crisis by generating clean energy.

To decrease greenhouse gas emissions, including carbon dioxide, governments and the private sectors around the globe have stepped up their efforts. For example, U.S. automakers, led by General Motors (GM) and Ford Motor (F), issued a joint statement on 5 August 2021 in which they shared the aspiration of Biden administration's target of pushing electric vehicles ("EVs") to account for 40-50% of their production by 2030. It means that the U.S. automobile industry has to boost its annual EV output to 7 million units or more from 2.6 million units that are currently planned for 2028 to attain the above-mentioned target. From a global perspective, BloombergNEF predicts that EV sales will shoot up to 14 million units in 2025 from 3.1 million in 2020, representing a compound annual growth rate ("CAGR") of approximately 35% for the five-year period.

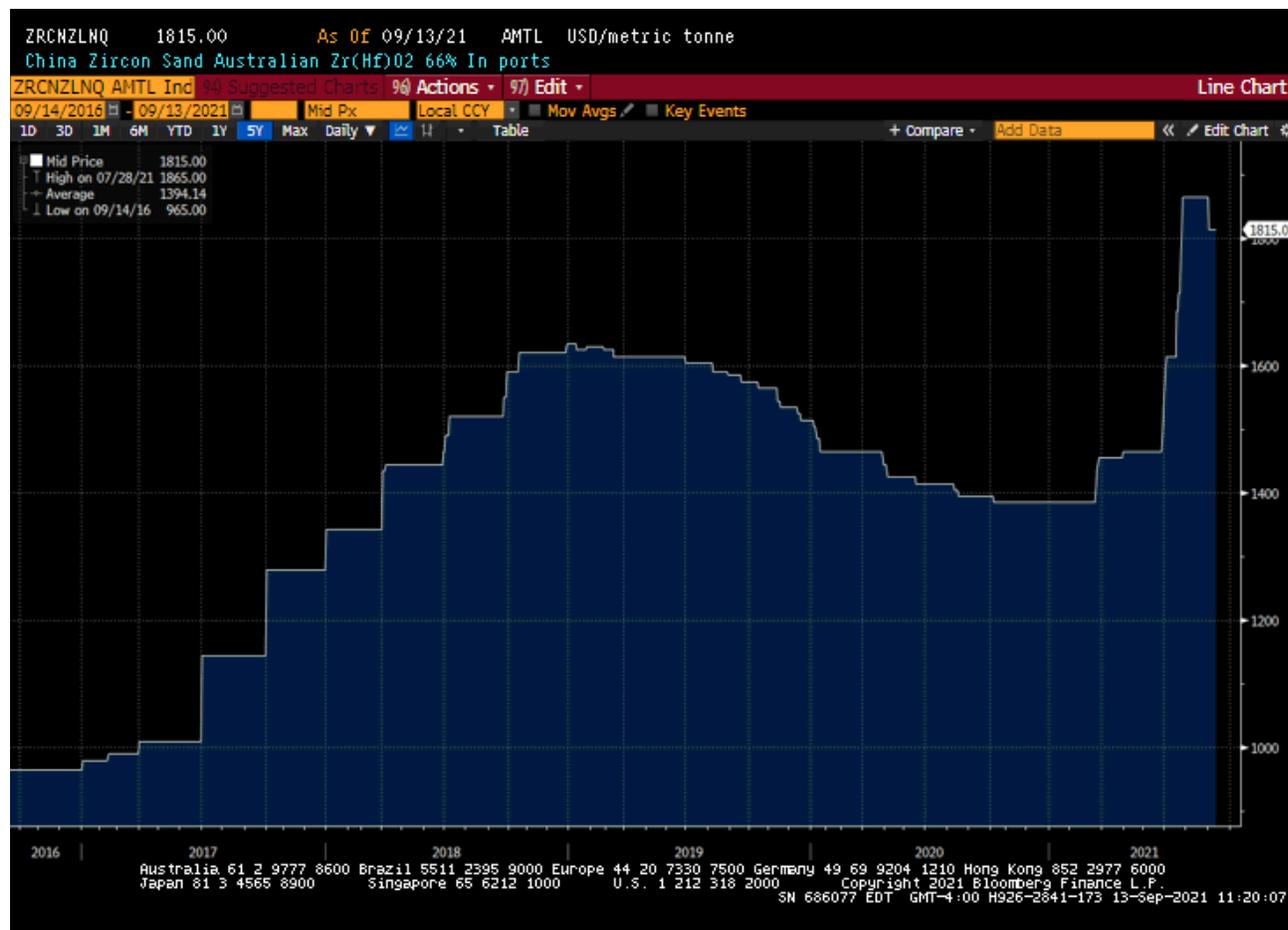
With respect to solar, demand outlook is striking. The White House outlined its solar energy plan in early September 2021 in which the emission-free energy will account for 45% of U.S. electricity generation by 2050, up from merely 3% currently. The plan was unveiled following the release of the Solar Futures Study conducted by the U.S. Department of Energy, which forecasts that solar energy could provide 1,600 gigawatts on a zero-carbon-grid by 2050, generating more electricity than consumed by all residential and commercial buildings in the country. Migrating to more solar power is part of the Biden administration's larger goal to decarbonize the domestic energy industry.

Zircon price strengthened in 1H 2021, as Chinese tile production returned to pre-pandemic levels although input cost surge had pressured real estate developers (major customers for tile producers). Tile production in Spain, Italy, Brazil and Turkey is reportedly operating at 90% capacity. Regarding fused zirconia, producers continue to enjoy desirable market conditions owing to the booming photovoltaic industry that has fueled demand for refractory from glass manufacturers. After the US\$70 per tonne zircon price increase in April 2021, Iluka Resources lifted the price further by US\$125 per tonne effective 1 July 2021. The jump in prices followed

a similar increase seen in the U.S. market, with U.S. ex-distributor prices standing at US\$2,495-US\$2,550/tonne in July 2021, a stunning 51-55% spike relative to \$1,650/tonne in 2Q. Even at higher prices, industry supply remains limited, while overall customer inventories remain low.

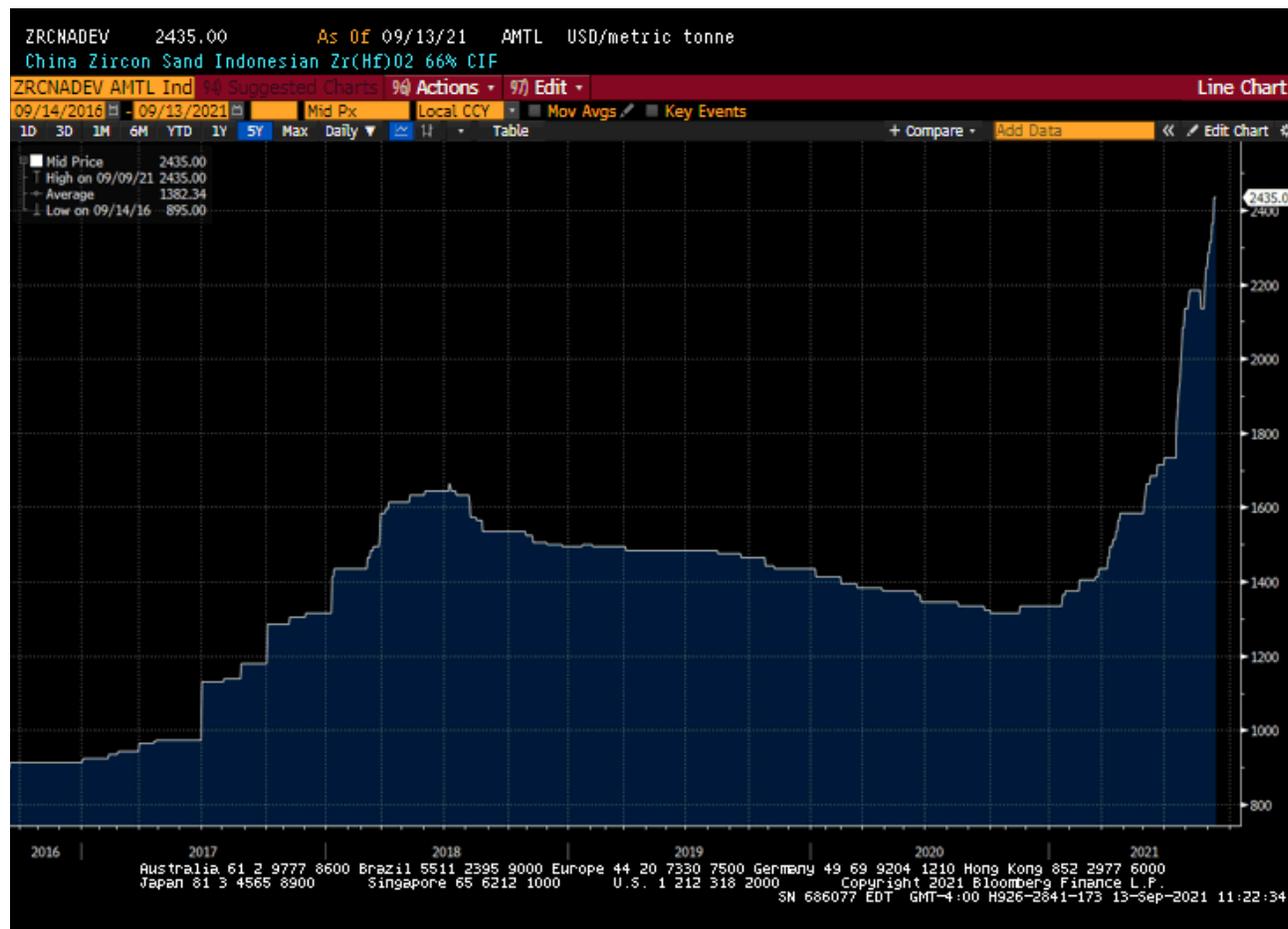
The upward momentum of zircon price is also evidenced by the price for China Zircon Sand Australian Zr(Hf) 66%, which reached historical high of US\$1,865 per tonne in August 2021.

**Exhibit III-1: China Zircon Sand Australian Zr(Hf) 66% (US\$/tonne)**



Source: Bloomberg

In parallel, China Zircon Sand Indonesian Zr(Hf) 66% hit a new-record high of US\$2,435 per tonne in September 2021, partially due to the trade conflicts between Australia and China and the production hurdles found in South Africa. Indonesian zircon has been gaining popularity, leading to more bargaining power and higher price.

**Exhibit III-2: China Zircon Sand Indonesian Zr(Hf) 66% (US\$/tonne)**


Source: Bloomberg

Research analysts at Credit Suisse and JP Morgan among others are projecting zircon price in the US\$1,510-US\$1,800 range for 2021 and US\$1,523-US\$2,500 per tonne for 2023.

We are more bullish about the price outlook for zircon. Based on our channel checks, we have high conviction that the latest price surge will carry on for the next 5 to 7 years, driven by strong industry fundamentals and a persisting demand and supply imbalance. The below table shows Cedrus' zircon price forecasts for the next three years (our outermost forecast period) in addition to summarizing the price forecasts of some other financial institutions.

**Exhibit III-3. Zircon Price Forecasts (US\$/tonne)**

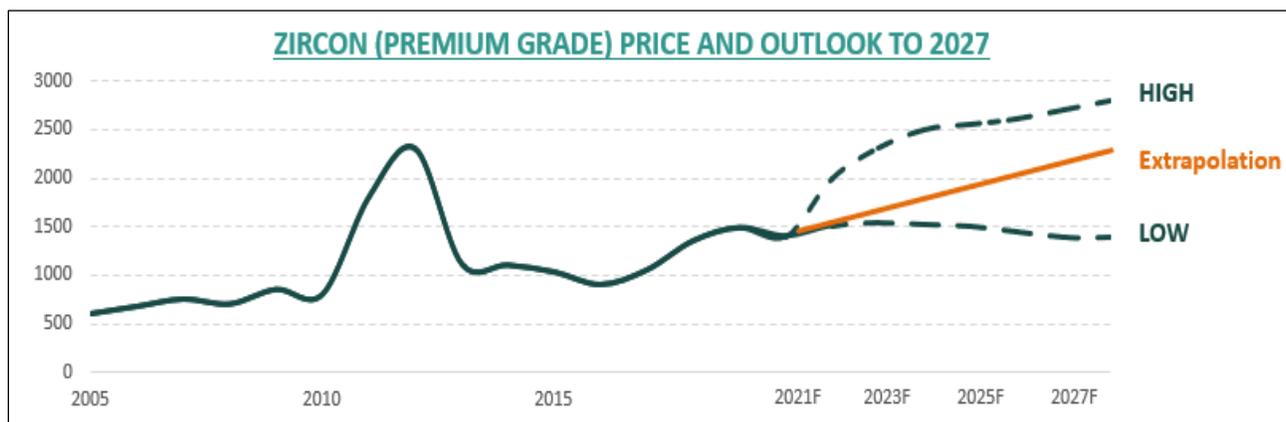
	2021	2022	2023	2024	2025	2026	2027
VSA Capital (as of 2021)	1,800	2,300	2,500	2,250	1,800	1,600	1,500
Credit Suisse (as of 2021)	1,510	1,540	1,523	1,250	N/A	N/A	N/A
JP Morgan (as of 2021)	1,546	1,658	1,679	1,683	1,500	N/A	N/A
<b>Cedrus (as of 2021)</b>	<b>2,000</b>	<b>2,300</b>	<b>2,400</b>	<b>2,500</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

Note: N/A = Not available

Source: Bloomberg

Furthermore, industry leader and third-party market research firm are also optimistic about premium zircon pricing throughout the forecast period between 2021 and 2027 as depicted below.

**Exhibit III-4: Premium-Grade Zircon Price Trend Projected by Industry Leader and Market Consulting Firm**



Source: ILUKA Investor Briefing, TZ Minerals Int'l Pty. Ltd. (TZMI), and Company's analysis

It is a well-known fact that the grades of existing zircon deposits are declining. To make the situation even more concerning is that it will be very likely no new supply of meaningful amount of zircon entering the market for the foreseeable future either from new discoveries or increased output of existing mines. Hence, demand is still projected to exceed supply going forward. Furthermore, there is no perfect substitution for zircon despite certain materials that possess some unique properties of zircon can be used for a number of restricted applications.

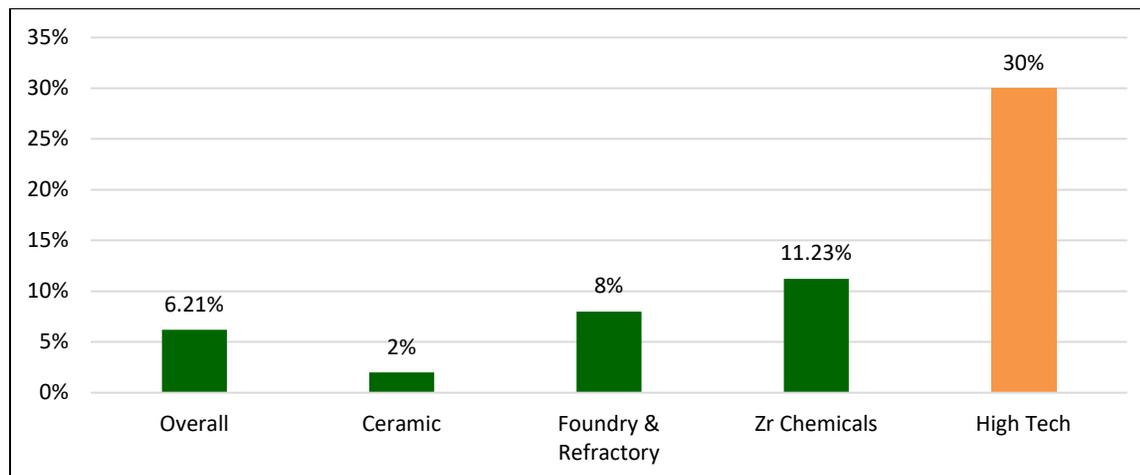
There has been a consistent imbalance of demand and supply for zircon globally. Zircon demand remains robust in general with a forecast CAGR of 2.7% in the 2019-2023 period, led by rising demand in China. On the other hand, zircon supply remains under pressure in 2021 due to global production disruption arising from several reasons: 1) the spread of novel coronavirus, reducing global zircon supply by approximately 10% according to Iluka's estimates); 2) output capacity constraints of current producers; 3) resources of existing mines continue to decrease; and 4) there are few projects with superior zircon quality. Thus, global supply is forecast to fall by 3.6%.

### 3.2 Zircon Demand by Application

High-tech applications are believed the new growth engine related to zircon demand going forward. Ceramic had been the dominating the end market for zircon in the past decade. However, its market share pertaining to total zircon demand has shrunk to below 50% by now. In contrast, other applications mainly in high-tech industry have grown faster and gained market share in terms of zircon demand.

Based on data compiled by market research firms and our analysis, the CAGR for zircon demand by the high-tech industry is 30%, well above the traditional ceramic and foundry and refractory end markets for the mineral.

### Exhibit III-5: Comparison of CAGR of zircon demand by Application



Source: ResearchAndMarkets, 360 Market Updates, Cedrus' analysis

## IV. CONCLUSION

Under the leadership of its outstanding management team, PYX has created substantial benefit and value to PYX's current shareholders as follows:

- PYX is the **producing zircon company globally with the world's second-largest amount of contained zircon** in mineral resources, only surpassed by the industry bellwether Iluka Resources;
- The **Company's share price soared 63% in the 1H 2021**, meaningfully higher than the 41% achieved by Iluka Resources in the same period; Moreover, its market capitalization has grown to near AU\$550 million as of the close on 13 September 2021;
- Impressive operation execution with workplace safety being a priority allowed the Company to deliver **growth in production, sales volume and revenue in the magnitude of 25%, 14% and 21%** correspondingly relative to 1H 2020 despite pandemic impacts. Has found no COVID-19 infection at any of its workplace ever since the outbreak of the pandemic;
- **Raised zircon price 3 times** in 1H 2021 on the heels of overall strong end-market demand, industry supply constraints, and low customer inventories;
- **Successfully marketed its premium zircon for high-tech applications**, which are expected a key growth driver for zircon demand in the future; and
- **Exploring the possibilities of dual listing PYX's shares** on LSE and **successful fundraising** of US\$8.4 million (before fees) illustrate the vision of the management team for the sake of the Company and its shareholders and confidence of investors on the Company's prospects. They also potentially lay the groundwork for PYX to flourish further.

We believe PYX's superior past performance is likely to repeat going forward. Hence, we reiterate an **Overweight** rating on PYX and maintain a **12- to 18-month price target of AU\$3.00**, representing an upside potential of about 135% over the latest closing price of AU\$1.279 as of 13 September 2021.

## IMPORTANT DISCLOSURES

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### STOCK OWNERSHIP AND CONFLICT OF INTEREST DISCLOSURE

- Neither Dr. Thomas Kenny, Charlie Yang nor any member of the research team or their households is an owner of Pyx Resources Limited common shares.

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Dr. Thomas Kenny and Charlie Yang hereby certifies that the views expressed in this research report accurately reflect his personal views about the subject companies and their securities. He also certifies that he has not been, and will not be, receiving direct or indirect compensation in exchange for expressing the specific recommendations in this report.

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