

Major Operation Update of PYX Resources: First Exports of 750 Tonnes of Monazite-rich Zircon Concentrates to China

New Milestone Achieved with First Shipment of Monazite-rich Zircon Concentrates

On 14 May 2024, PYX Resources Limited (“PYX” or the Company) dual-listed on the London Stock Exchange (LSE: PYX) and National Stock Exchange of Australia (NSX: PYX) announced that it had shipped its monazite-rich zircon concentrates to a customer in Hainan, China.

The exports of 750 tonnes of such rare earth element (“REE”)-rich minerals represent the very first shipment and another milestone reached by PYX, expanding to the strategically-important REE market. It is because REEs are pivotal to some of the fastest-growing industries such as electronics, renewable energy systems, and electric vehicles (“EVs”). Moreover, the exports also demonstrate the relentless efforts made by the Company’s management team to maximize the monetization of the mineral sands deposits and further diversify its revenue base in addition to the sale of premium zircon and titanium dioxide minerals (ilmenite and rutile).



Share Price (as of 16 May 2024):
AU\$0.20/GBp10.75
12- to 18-month Target Price:
AU\$3.81/GBp196 (no change)

Market Cap (as of 16 May 2024):
AU\$91.8M/GBP49.3M
Total Shares: 458.8 M
Dividend and Yield: N/A

About Monazite and Rare Earth Elements

Monazite is a constituent of mineral sands, and this mineral holds particular significance due to its richness in REEs. On earth, there is a group of 17 REEs, namely lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu), scandium (Sc), and yttrium (Y).

Monazite is a mineral that is mined as a byproduct of heavy mineral sands deposits. It exists in five unique species, each harboring a rich assortment of REEs, including cerium, lanthanum, thorium, neodymium, and yttrium, chemically bonded to phosphate or silica.



Specifically, as a component of monazite sand, monazite is used in construction and casting. Moreover, monazite is also utilized as a material for the production of glass and catalytic converters. However, being the source of some of the most valuable REEs mentioned above, monazite is heavily relied on for producing catalysts, permanent magnets, electronics, energy-efficient lighting, aerospace and EV components, as well as medical devices.

Even though rare earths are relatively abundant in the earth’s crust, their minable concentrates are much less commonly found than most other mineral commodities. In 2022, worldwide REE production amounted to an estimated 300,000 tonnes of rare earth oxide (“REO”) equivalent. With the largest known reserves globally of

44 million tonnes, it is not surprising to see that China's rare earth production alone accounted for roughly 70% of the world's total in 2022. Global mine production in 2023 was estimated to have increased to 350,000 tonnes of REO equivalent. China's Ministry of Industry and Information Technology raised the country's 2023 quotas for rare-earth mining and separation to 240,000 tonnes and 230,000 tonnes of REO equivalent respectively, with the mining quota apportioned to 220,850 tonnes of light rare earths and 19,150 tonnes of ion-adsorption clays. Besides China, Canada, Greenland, and Australia are projected to be other prominent sources of REEs in the future.

Exhibit 1: World's Reserves and Production of Rare Earths in Tonnes

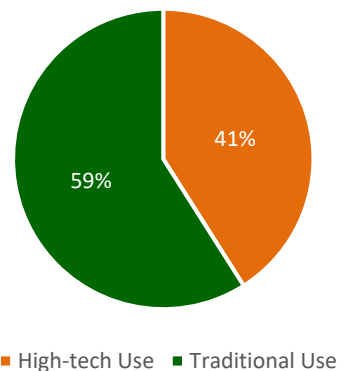
	Production in 2023	Reserves
U.S.	43,000	1,800,000
Australia	18,000	5,700,000
Brazil	80	21,000,000
Burma	38,000	NA
Canada	—	830,000
China	240,000	44,000,000
Greenland	—	1,500,000
India	2,900	6,900,000
Madagascar	960	NA
Malaysia	80	NA
Russia	2,600	10,000,000
South Africa	—	790,000
Tanzania	—	890,000
Thailand	7,100	4,500
Vietnam	600	22,000,000
World total (rounded)	350,000	110,000,000

Source: Rare Earths – 2024 by U.S. Geological Survey ("USGS")

Uses and Applications of REEs

The traditional use of REEs in mature end markets accounts for 59% of its worldwide consumption. According to USGS data, these applications include catalysts, glass-making, lighting, and metallurgy. In the mature end market segments, lanthanum and cerium constitute to roughly 80% of REE usage.

Due to incredible growth in demand, the newer, high-growth end markets have gained traction and now represent around 41% of total global consumption of REEs. These applications are high-tech related, including battery alloys, ceramics, permanent magnets and electronics. In these high-tech markets, dysprosium, neodymium and praseodymium make up around 85% of REEs utilized. In addition, REEs are widely used

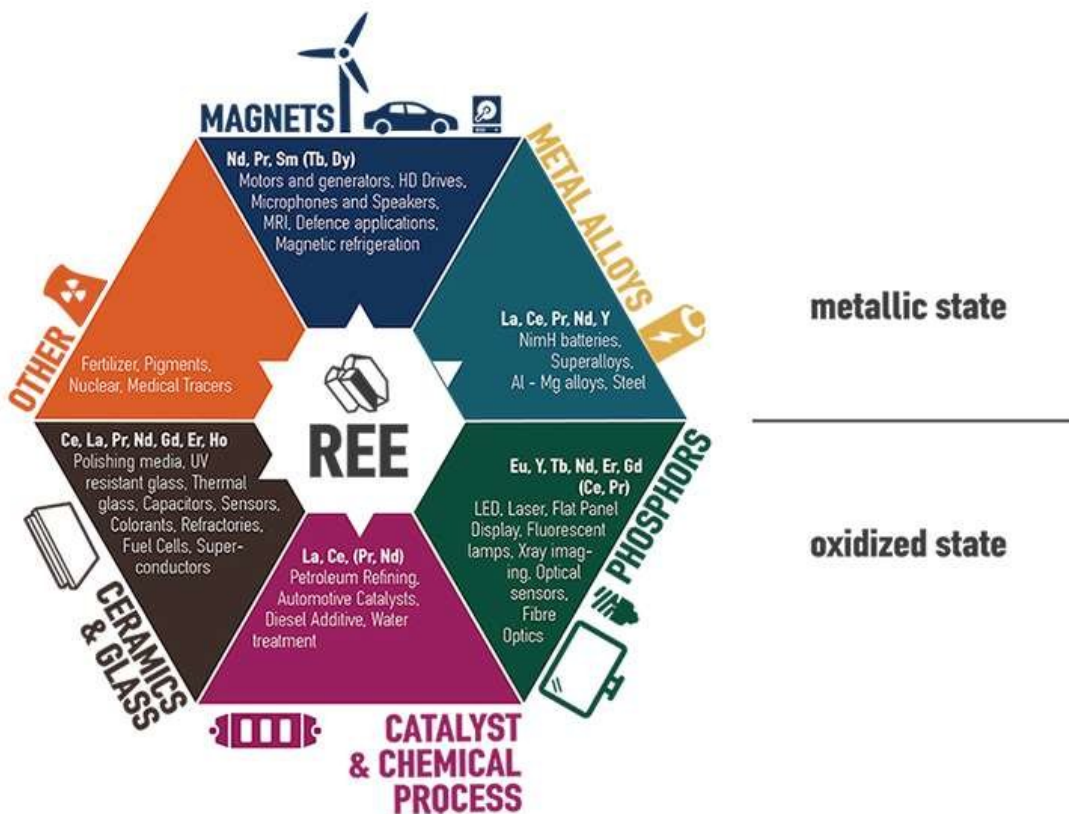


in military applications, ranging from fin actuators¹, missile guidance and control systems, disk drive motors installed in aircraft and tanks, satellite communications, along with radar and sonar² systems. REEs also play an essential role in national defense, as their products are being deployed in night-vision goggles, precision-guided weapons, communications equipment, GPS (Global Positioning System) equipment, batteries, and other defense electronics.

In summary, some of the critical REEs or the byproduct of monazite coupled with their high value-added applications are as follows:

- **Cerium and neodymium** are vital components in catalytic converters for cars and wind turbines;
- **Lanthanum** is used in rechargeable batteries;
- **Thorium** shows promise in advanced nuclear reactor design; and
- **Yttrium** enhances the performance of superconductors and LED lights.

Exhibit 2: Applications of REE



Source: EURARE.org

¹ Designed to guide very small objects and disposing of them in an extremely limited space. They meet strict requirements in terms of performance, weight and dimensions

² A technique that uses sound propagation to navigate, measure distances (ranging), communicate with or detect objects on or under the surface of the water



Owing to their widespread applications in various advanced technologies, REEs are also known as the "vitamins of modern industry."

Demand for REEs has been on the rise not only because of their unique attributes that enable differentiations in the functionality of their end products but also due to the fact that REE substitutes available on the market for many applications are generally less effective. REEs are not recycled in large quantities, but could be if recycling became mandatory, or prices of REEs are high enough that makes their recycling economically feasible.

While China produces about 70% of REEs worldwide, it processes almost 90% of the world's REEs. This is attributable to China having the technical know-how on rare earth extraction and separation so that it is heavily depended on by countries even with meaningful reserves of rare earths. China's dominant position in this regard is further strengthened when it announced a ban on its extraction and separation technologies with respect to the manufacturing of rare earth magnets on 21 December 2023. In an effort to reduce reliance on China, some countries like the U.S. have begun building their own facilities to produce more rare earth products, but it will take years for them to commence operations. Therefore, in our view, China's dominance in this aspect is not expected to be severely challenged at least in the medium term.

In conclusion, first shipment of monazite-rich zircon concentrates to China by PYX in May 2024 following the announcement of starting deliveries of ilmenite in March 2024 is a strong testament of the competence of the Company's management and evidence of its constant pursuit to create shareholder value by broadening revenue stream and maximizing profits. With an extensive customer network in China, we believe PYX should be one of the prime beneficiaries of the heightened demand for REEs in years to come.

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- Neither Charlie Yang, Hilda Gao nor any member of the research team or their households is an owner of PYX Resources Limited common shares.

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