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Argus White Paper:

Diversifying rare earths: Building a market, not just a supply chain

The race is on to develop new rare earth supply chains outside China. Rising geopolitical tensions and demand from the energy transition mean governments are waking up to a strategic vulnerability that has been brewing for decades. Each week brings a flurry of new project announcements. Once heavily centred on upstream projects, but now increasingly focused on midstream processing and magnet production, full supply chains are gradually taking shape outside China. But independent supply chains require independent pricing mechanisms. In this white paper, Argus looks at how best to manage this next phase of evolution

The status quo: Extreme price volatility, little control

The status quo troubles the international community for a number of reasons.

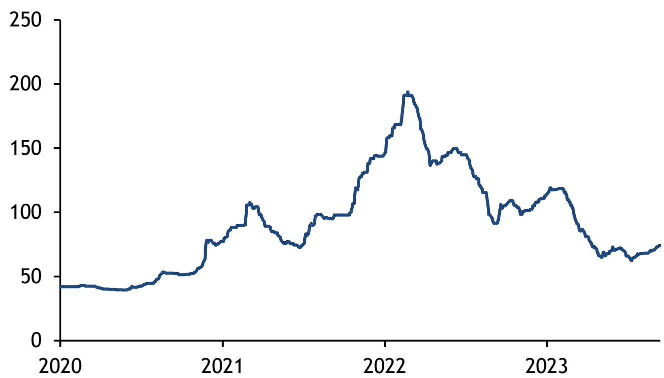
The first is price volatility. Rare earth prices can move swiftly and are heavily influenced by China's domestic dynamics. Neodymium oxide — one of the core magnet materials and a touchstone for the rare earths complex — has swung sharply between \$39.50/kg and \$193.75/kg on a fob China basis since the start of 2020 (see chart).

The second and third quarters of 2023 brought a bit more stability for light rare earths (including neodymium), but how long this will last is unclear. Meanwhile, dysprosium has staged a notable recovery since April, pushing ex-works China prices for September up to levels last seen in May 2022 (see chart).

The second reason is security. Those with long memories point to the extraordinary events of 2010-11 (see chart, p2), which show how sharply Chinese rare earth prices can rise in the wake of political interventions. That intervention ostensibly related to environmental controls, although it was widely seen as having a geopolitical angle. In a more combative and protectionist climate, similar, or more extreme, events are not unthinkable.

Firms outside China do of course have a say on the price at which they buy and sell, but the Chinese market sets the foundation on which negotiations are built. Ultimately, if Chinese prices move sharply, the rest of the world has to follow suit, and the impact on margins can be uncomfortable. China's scale makes its influence inevitable. But exposure would be mitigated if alternative pricing mechanisms reflecting regional values were more widely available.

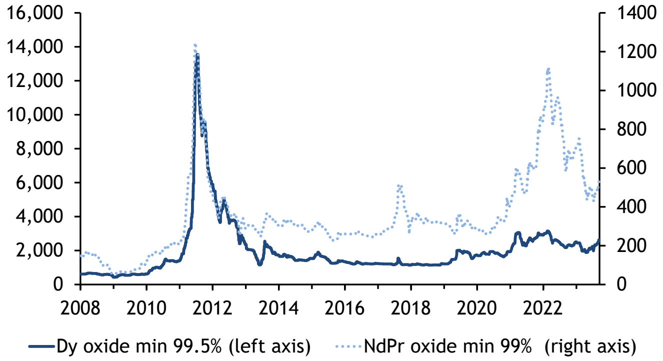
Nd oxide prices have swung sharply since 2020 $/kg



Choppy Dy market stages mid-2023 recovery

Metals
illuminating the markets®

Memories of 2011 price spikes still loom large



New projects and investor discomfort

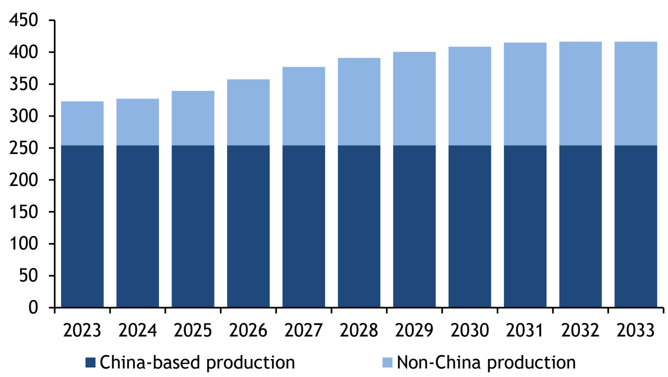
Rare earths supply is excessively concentrated. China produces over 85pc of the world's separated rare earth metals, according to Argus data. But investment in alternative supply is deterred by volatility in prices for the final product and an inability to reduce exposure to it. A new rare earths project can easily require around $1bn just to get started. Raising these funds is more challenging when the road ahead is fraught with risks and there is little control over the final selling price.

Forecasting the economic feasibility of new mines of any type is always tricky. But in rare earths, the volatility and political nature of the price mechanisms make it even more precarious. And there is often a simmering concern that projects could build up around the world, but then be brought to their knees in the event of an external price shock. Indeed, the concentration of pricing power hangs heavy over potential investors.

Market participants have been adopting several strategies in a bid to control risk:

- Encouraging OEMs to sign long-term offtake agreements at a very early stage, sometimes pre-construction — giving investors more confidence to participate

Production outside China will grow



- Vertical integration — control multiple parts of the value chain to maximise operational efficiencies and reduce certain supply risks
- Forming close partnerships with other parts of the value chain — for example through the use of tolling agreements and long-term sales deals
- Lobbying for more government support — funding, faster permitting procedures and helpful policy frameworks

In many respects, these strategies make sense and they may indeed succeed in driving up output of rare earth products and magnets outside China. But while at face value they appear to solve a problem, some of them simultaneously risk stalling the evolution of the independent price mechanisms that are required as part of the solution.

Pricing a product with no market. What are 'rare earth prices'?

The vast majority of rare earth oxides and metals change hands under long-term contracts — out of sight and confidential, only the counterparties are privy to the exact terms, including, of course, the price.

This leaves a limited volume that is fed into the spot market for ad hoc purchases at a market price. It is this that generates the data from which rare earth price assessments, such as those published by Argus, are constructed — spot trades fitting within specified parameters, transacted at arms length between separate entities.

As with so many commodities, it is this 'marginal tonne' (or kilo) that sets the price for the wider market. These prices are often referenced during negotiations or written into pricing formulas for those long-term contracts under which most material changes hands.

In rare earths, not only does the vast majority of trade happen in China as either domestic or export transactions (because it is such a large part of the market), but the amount concluded on a spot basis is also unusually high. Spot trade outside China does occur — but to a far smaller extent. Consequently, Argus assesses domestic Chinese prices either daily or twice a week, but European assessments are limited to just once a month.

These key pillars on which price indices rest are often overlooked, yet must be understood and kept in mind. Building new price mechanisms should go hand in hand with creating sustainable rare earth supply chains around the world. The alternative might address supply risks, but it could leave the newly created supply chain open to the same price risks as before.

This necessitates deliberate decisions that could be may be less appealing to companies in the short term, but are essential for the long-term health of the market, notably the allocation of some tonnes to a transparent ex-China spot market. Signing a long-term offtake agreement at a fixed (and confidential!) price clearly offers an enticing security blanket for a long-term investment. But without healthy liquid spot markets, plenty of arms-length deals (that reach outside vertically integrated company structures) and sufficient transparency toward price reporting agencies, China will always set the price for everyone else — regardless of how much material is being produced elsewhere.

Building supply chains vs building markets

There is often a misconception that long-term supply contracts will gradually lead to more stable pricing, pulling the focus away from China's volatile spot market towards a more steady pricing environment. Yet experience suggests the opposite — heavy use of long-term contracts forfeits price control to those that are most active in the spot market.

The evolution of some other commodity markets underscores this point. It has been nearly 15 years since stable long-term iron ore contracts transformed into a spot-based market that now sustains both physical and financial pricing tools. That evolution was underpinned by Chinese buyers coming into the market, seeing large volumes of iron ore locked into term contracts by their traditional Japanese and South Korean consumers on a spot basis. Price mechanisms evolved around this spot price. The short-term desire for security of supply prevented the formation of spot pricing for steelmakers in Europe, Japan and other key buyers. They now price based on indexes set in China.

It goes without saying that China will always have a lot of influence over the global rare earths market, simply by virtue of scale. It is unlikely that any other country will come close to matching Chinese production or consumption within the next few decades. But this does not mean other regional price mechanisms cannot evolve and bring significant value.

Praseodymium is already carving out a character of its own in Europe, with oxide sometimes circulating in the spot market for a few dollars less than Chinese net forwards would suggest, due to the supply chain diversifications that have already taken place.

Time will tell how much further such evolutions will be pushed —— they will be pivotal to giving many internationals the agency over rare earth pricing that they crave and creating healthy markets to underpin supply chain diversification.

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