Rare Earth Pricing Quarterly Outlook

A subscription-based report from
Adamas Intelligence

Adamas Intelligence

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Important Notes:

All prices referred to herein are in U.S. dollars unless specified otherwise.

Due to rounding, numbers presented throughout each quarterly report may not add up precisely to the totals provided and percentages may not precisely reflect the absolute figures.

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Terminology and Abbreviations

Abbreviation	Terminology	Definition
REE	Rare Earth Element	The lanthanide series of chemical elements, plus yttrium
REO(s)	Rare Earth Oxide(s)	Chemical oxides of lanthanides and/or yttrium
TREO	Total Rare Earth Oxide	The collective of all rare earth oxides combined
Mag REO	Magnet Rare Earth Oxides	The collective of Nd2O3, Pr6O11, Dy2O3 and Tb4O7 combined
LREO(s)	Light Rare Earth Oxide(s)	La2O3, CeO2, Pr6O11, Nd2O3, Sm2O3, Eu2O3, Gd2O3
HREO(s)	Heavy Rare Earth Oxide(s)	Tb4O7, Dy2O3, Ho2O3, Er2O3, Lu2O3, Yb2O3, Tm2O3, Y2O3
La2O3	Lanthanum Oxide	Commonly produced form of lanthanum oxide
CeO2	Cerium Oxide	Commonly produced form of cerium oxide
Pr6O11	Praseodymium Oxide	Commonly produced form of praseodymium oxide
Nd2O3	Neodymium Oxide	Commonly produced form of neodymium oxide
NdPr Oxide	Didymium Oxide	Combined form of neodymium (75%) and praseodymium (25%) oxide commonly used by NdFeB manufacturers instead of individual neodymium and/or praseodymium oxides
Sm2O3	Samarium Oxide	Commonly produced form of samarium oxide
Eu2O3	Europium Oxide	Commonly produced form of europium oxide
Gd2O3	Gadolinium Oxide	Commonly produced form of gadolinium oxide
Tb4O7	Terbium Oxide	Commonly produced form of terbium oxide
Dy2O3	Dysprosium Oxide	Commonly produced form of dysprosium oxide
Ho2O3	Holmium Oxide	Commonly produced form of holmium oxide
Er2O3	Erbium Oxide	Commonly produced form of erbium oxide
Yb2O3	Ytterbium Oxide	Commonly produced form of ytterbium oxide
Lu2O3	Lutetium Oxide	Commonly produced form of lutetium oxide
Y2O3	Yttrium Oxide	Commonly produced form of yttrium oxide
Sc2O3	Scandium Oxide	Commonly produced form of scandium oxide
NdFeB Magnet	NdFeB Magnet	The final sintered or bonded magnet form (often coated to protect from corrosion) ready for use in a particular end-use or application
$	U.S. dollars	All prices and values referred to herein are in U.S. dollars unless specified otherwise
2N, 2N5, 3N, 3N5, 4N, 5N	2N = 99%, 2N5 = 99.5%, 3N = 99.9%, 3N5 = 99.95%, 4N = 99.99%, 5N = 99.999%	These abbreviations refer to product purity. The initial number indicates how many nines in the purity specification. The last number (if present) indicates the final digit of the purity specification (i.e., 2N5 = 99.5% or 3N5 = 99.95%)

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A. Key Market Developments in Q4 2023

Review

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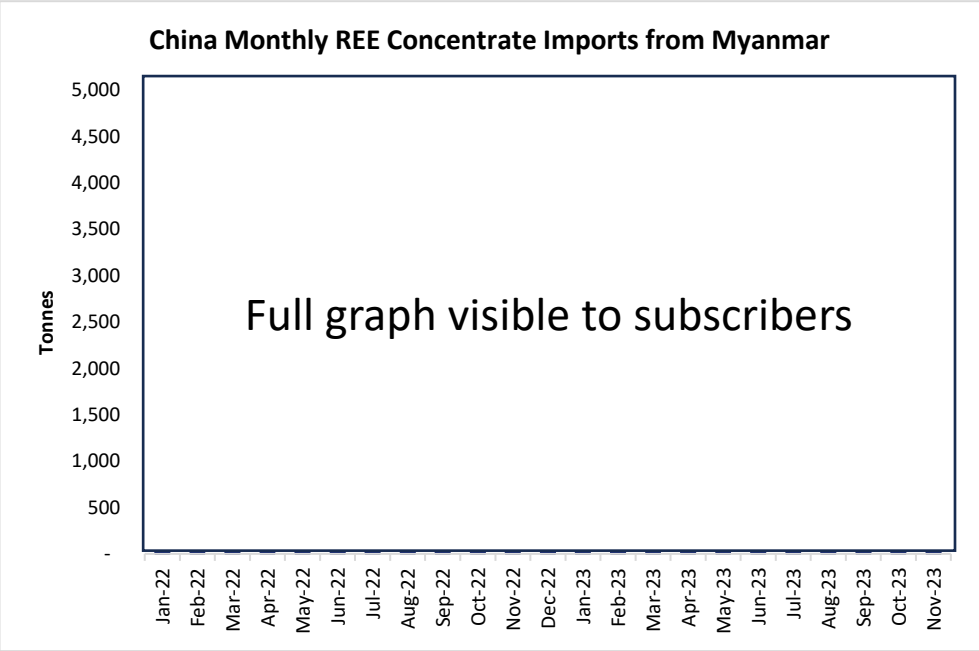
Exports from Myanmar to China persisted

Myanmar – China trade

Despite key border closures, exports to China persisted



In September, rare earth production in Myanmar's Pangwa region in Kachin State, the country's rare earth mining epicenter, was ordered to stop for random inspections. Inspections were expected to last just 10 days but persisted for over a month as 300 mining sites in the region awaited notice that they could resume operations.

However, since October, Myanmar's military has been engaged in escalating battles with an alliance of ethnic armed groups in the region fighting to overturn the 2021 coup. The alliance has seized several towns and key border routes to China since the offensive began. Despite capturing four border gates to China in November, rare earth concentrate flows from Myanmar to China have persisted, albeit at a reduced level.

Market impact: Year-to-date, imports from Myanmar are up nearly 4x, offsetting another year of unchanged heavy rare earth production quotas in China. Overall, increased production in 2023 was met with strong NdFeB demand from most end-use segments.

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Fighting intensified near Myanmar-China border

Resistance forces captured 4 border gates in Q4

China mediated a ceasefire in early January

Source: Mainstream media

In Q4 2023, the military conflict in Myanmar escalated to levels not see since the 2021 coup began.

With much of the fighting centered around key border states with China – namely Kachin and Shan – the continuance of Myanmar-China trade is at risk, if only temporarily. In November it was reported that trade at border crossings in Muse and Chinshwehaw had totally stopped and by month-end the resistance forces had seized four key border crossings in the region.

Market impact: After the U.S., Myanmar is the largest exporter of rare earth feedstocks to China globally and is an essential supplier of heavy rare earth concentrate in particular, mining more than a third of the world's dysprosium and terbium supplies annually.

Having indirectly outsourced as much as XX% of heavy rare earth mine production annually to Myanmar in recent years, the ongoing dispute means there is a lot on the line for heavy rare earth refiners (i.e., importers of Myanmar feedstock) in China's south – underpinning China's eagerness to mediate a ceasefire.

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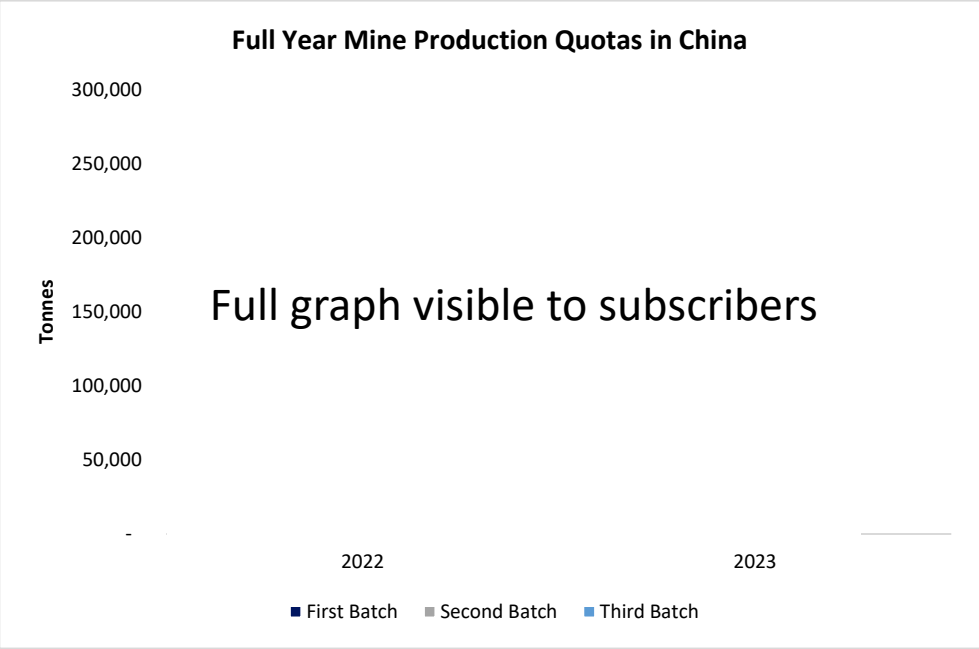
China issued a third batch of production quotas

Smaller than unofficial third quota in 2022

Third batch goes almost entirely to China Northern RE Group



The third batch allows for an additional XX,XXX tonnes of TREO to be mined, and XX,XXX tonnes to be separated and refined on top of what the earlier two quotas allowed for. China Northern Rare Earth Group, the largest producer and processor in the nation, received a XX,XXX tonne and XX,XXX tonne boost to its mining and separation quotas, respectively, in the third batch and China Rare Earth Group received X,XXX tonnes and X,XXX tonnes, respectively.

In total, China's 2023 mining quota amounted to XXX,XXX tonnes (up 9% YoY) and its separation and smelting quota XXX,XXX tonnes (up 8% YoY).

Following the issuance of the third quota, rare earth prices have spiraled lower. China Northern Rare Earth Group dropped its NdPr and Nd oxide guidance prices by X% to X% at the beginning of January, leading the spot market to follow and overshoot the drop.

Market impact: The third batch comes at a time of weak demand (fundamentally and seasonally) and what is expected to be a challenging year for major economies around the globe, especially that of China, hence the negative price response. That said – we believe the recent spot market price drops have been overblown.

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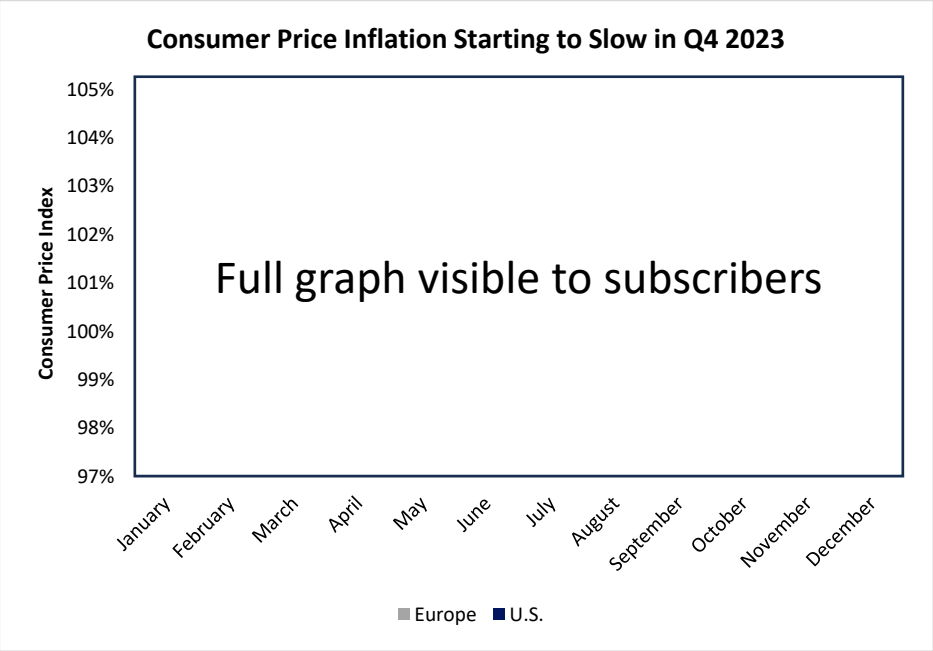
Consumer price increases slowed in Q4

Consumer price index measures changes in prices

Inflation coming down, consumer price increases slowing



With inflation gradually declining in major markets since Q3, lower input prices percolating through product value chains began to slow the rise of consumer prices in Q4.

In Q4, the U.S. and Europe saw the rate of consumer prices increases slow nearly month-after-month after cresting in Q3.

Market impact: Very encouraging to see consumer price inflation on the decline albeit there is still much room for improvement needed in today's economic environment for consumers to loosen their purse strings.

As we have noted, rising consumer prices negatively impact consumer confidence and spending. With consumer electronics, cordless powertools and consumer appliances collectively driving over XX% of global NdFeB magnet consumption each year, a wide-scale reduction in consumer confidence and spending has a materially negative impact on NdFeB demand and rare earth prices, as we observed throughout 2023.

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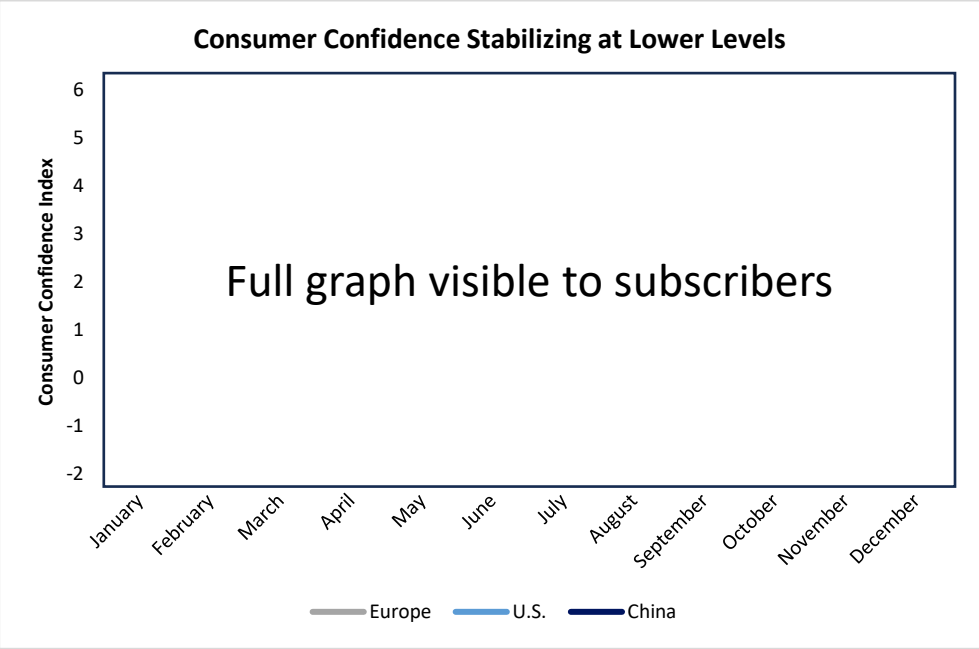
Weak consumer confidence persisted

Consumer confidence in key markets

Converging and stabilizing at low levels in Q4



Since the start of 2023, consumer confidence has wavered in key demand markets, hindered by high inflation, rising consumer prices and economic headwinds.

After reconverging at low levels in Q2, weak consumer confidence persisted in China and the U.S. in Q3 while that of Europe touched an eight-month low in August. In Q4, consumer confidence stabilized and converged at low levels in all key markets.

Market impact: As noted on the previous page, rising consumer prices negatively impact consumer confidence and spending. With consumer electronics, cordless powertools and consumer appliances collectively driving over XX% of global NdFeB magnet consumption each year, a long-lived reduction in consumer confidence and spending has a materially negative impact on NdFeB demand and rare earth prices, as we saw throughout 2023.

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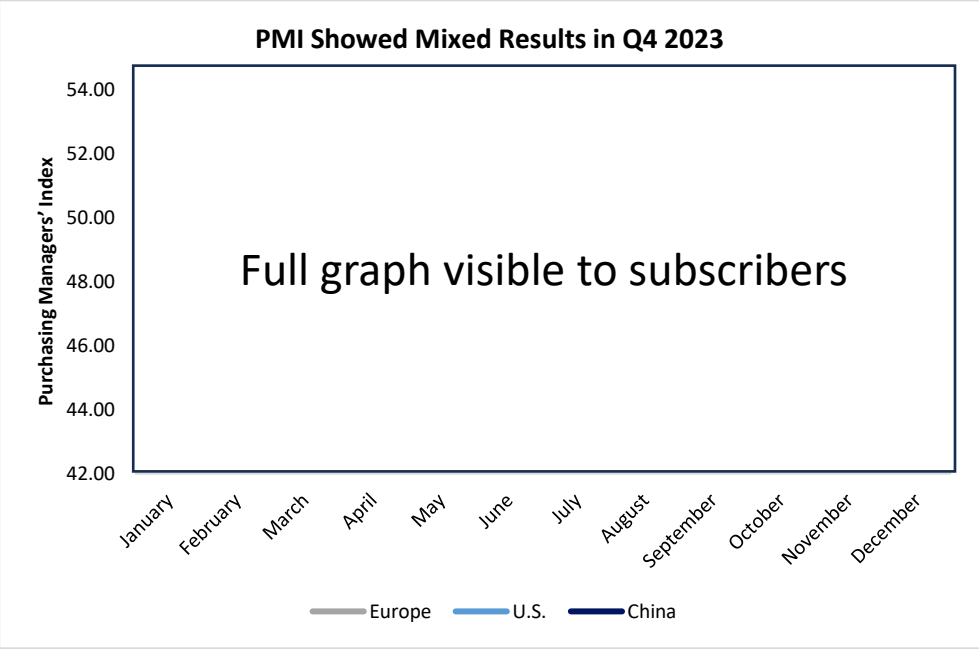
Wavering manufacturing PMI

Purchasing managers' index

PMI down in U.S., up in Europe and up in China



Since the start of 2023, the purchasing mangers' index ("PMI"), much like consumer confidence, has wavered in key markets, hindered by high inflation, uncertainty and economic headwinds.

In Q4 2023, the manufacturing PMI rose overall in Europe and China and fell overall in the U.S.

Market impact: In Q4 2023, declining and negative (i.e., below 50) PMI numbers are a reflection of declining consumer confidence and spending in key markets and, consequently, the need to produce less goods for those markets.

In anticipation of the seasonally weak first quarter of 2024, declining and negative PMIs in Europe and the U.S. in Q4 (i.e., decrease in new orders, production, stock purchases, etc.) contributed to the weakening of rare earth demand and prices in Q4.

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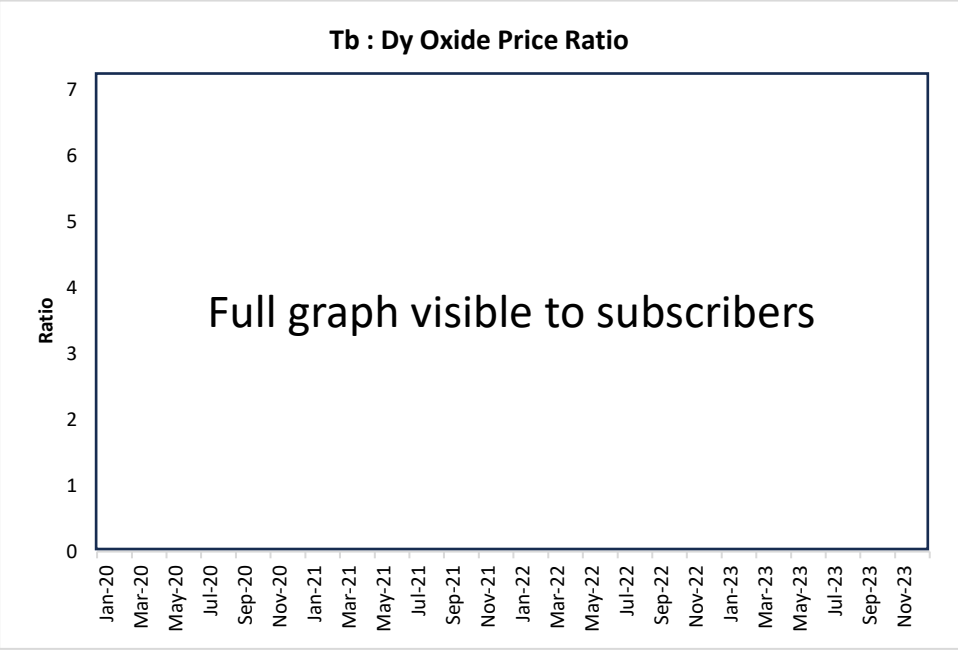
Tb to Dy price ratio adjustment complete

Heavy rare earth prices

Tb : Dy price ratio maintains historic norm of ~3x in Q4



Source: Adamas Intelligence analysis

Following a major price correction in Q1 and Q2, the Tb:Dy price ratio returned to a historic norm of ~Xx in Q3 and Q4, down from the X.Xx to X.Xx range that prevailed in 2022.

Since July 2023, dysprosium and terbium price movements have more closely mirrored each other, helping sustain the ~Xx price ratio between them.

Market impact: Historically, the Tb:Dy price ratio averaged in the X.Xx to X.Xx range, which was a rational range given the greater effectiveness of Tb at improving magnet coercivity than Dy. In the Xx to Xx range, end users prefer Dy over Tb where possible, fueling a downward correction in Tb oxide price and a steady drop in the Tb:Dy price ratio as observed through the first half of this year.

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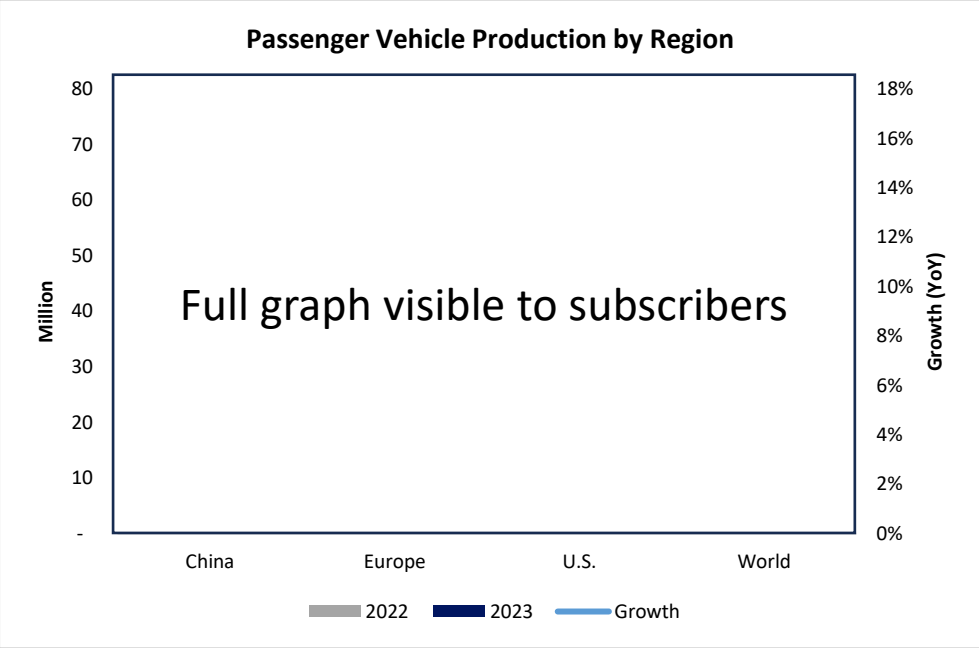
Automotive industry rebounded

Passenger vehicle production, 11-month YTD 2023

Double-digit growth in U.S., Europe and China



Despite weak consumer confidence and manufacturing activity broadly, the global automotive industry is on track for an appreciable rebound in 2023 following years of supply chain bottlenecks that suppressed global production.

Through the first eleven months of 2023, global passenger vehicle production is up XX% versus the same period the year prior, led by increases in Europe (up XX% year-over-year), the U.S. (up XX% year-over-year) and China (up XX% year-over-year).

Market impact: With NdFeB magnets used widely in micromotors, sensors and speakers for passenger vehicles (making up XX% of NdFeB demand in 2022), the ongoing recovery of vehicle production is having a materially positive impact on NdFeB magnet demand.

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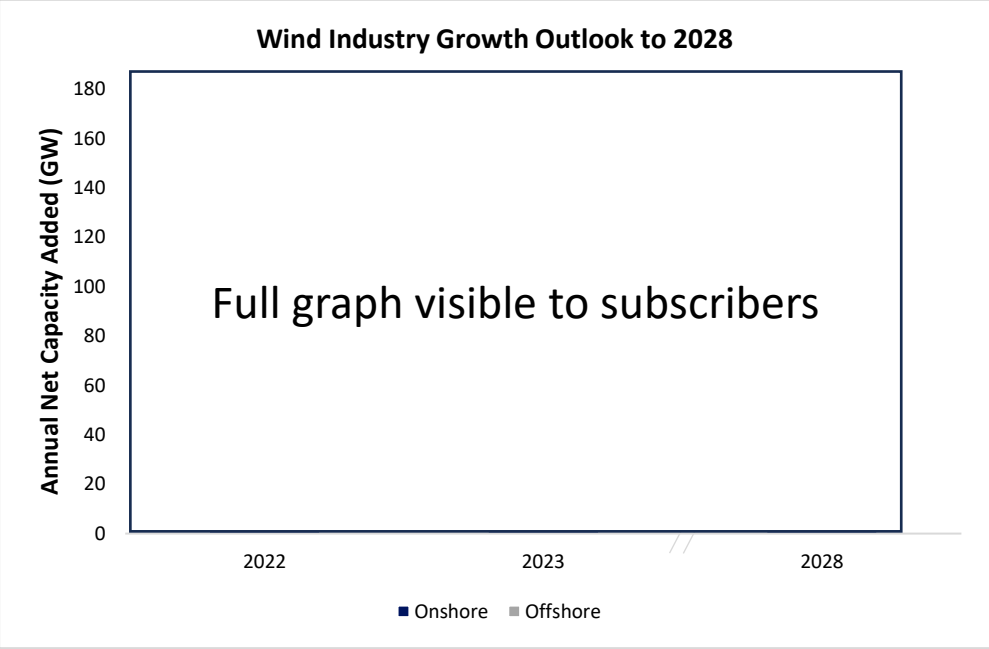
Wind industry sailed higher

Massive capacity increase in 2023

Long-term growth outlook remains intact



Source: IEA, Adamas Intelligence analysis

Despite the highly publicized headwinds facing the global wind industry in 2023, new data from the IEA indicates that the global offshore market grew by 35% in 2023 while the much larger onshore market added 46% more capacity.

This growth is especially remarkable considering the cancellation of some intended capacity last year owing to the challenging, inflated economic environment of 2023 relative to what was anticipated a few years ago when that capacity was contracted.

Market impact: Looking ahead, the IEA reduced its long-term wind growth forecasts for the ex-China market (which today is collectively just a fraction of China) by 15%, but increased its long-term growth forecasts for China by 60%, resulting in a net increase for the global market outlook overall.

Despite wind investment costs being ~20% higher today than a few years ago, wind remains one of the cheapest forms of power generation. We expect much of the 'cancelled' projects in the U.S. and UK in 2023 will be re-tendered again in 2024/25/26.

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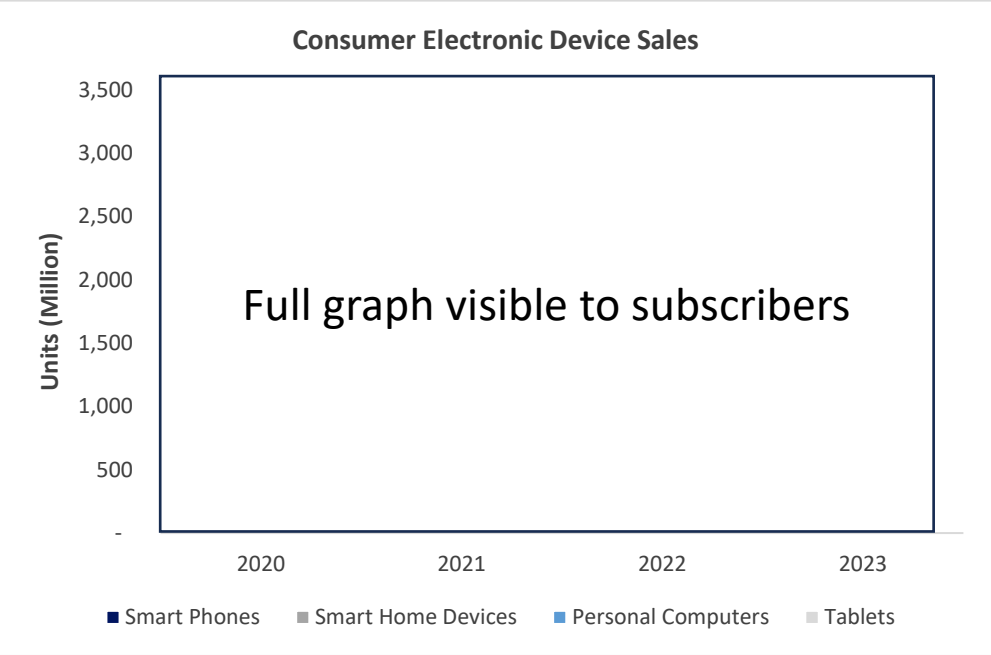
Consumer industry woes continued

Electronic device sales down in 2023

Computers, tablets, smart phones and home devices down



In 2023, global shipments of smart phones, smart home devices, PCs and tablets collectively fell by X.X% from the year prior.

This drop was led by tablets and PCs, for which shipments fell XX.X% and XX.X% year-over-year, respectively.

Shipments of smart phones and smart home devices (e.g., thermostats, cameras, smart speakers, etc.) fell X.X% and X.X%, respectively, over the same period.

Market impact: As highlighted on previous pages, rising consumer prices (i.e., inflation) negatively impact consumer confidence and spending, as the data reflects.

With consumer electronics, cordless powertools and consumer appliances collectively driving over XX% of global NdFeB magnet consumption each year, a long-lived reduction in consumer confidence and spending has a materially negative impact on NdFeB demand and rare earth prices, as we saw throughout 2023

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B. Price Performance in Q4 2023

Review

Summary

Price forecasts vs. actual prices in 2023

Following a weak Q1, Q2 and Q3 performance, average magnet rare earth oxide prices increased just modestly in Q4 2023, dragging YTD average prices slightly below previously forecasted levels for the year for most rare earth oxides.

Overall, prices trended slightly higher in Q4 2023 on strong EV sales, wind power installations, and market activity in advance of the year-end holiday season.

In 2023, actual magnet rare earth oxide prices differed from our most recent forecasts for the year as follows:

- The actual average NdPr oxide price observed in 2023 was X.X% lower than forecasted.
- The actual average Nd oxide price observed in 2023 was X.X% lower than forecasted.
- The actual average Pr oxide price observed in 2023 was X.X% lower than forecasted.
- The actual average Dy oxide price observed in 2023 was X.X% lower than forecasted.
- The actual average Tb oxide price observed in 2023 was X.X% lower than forecasted.

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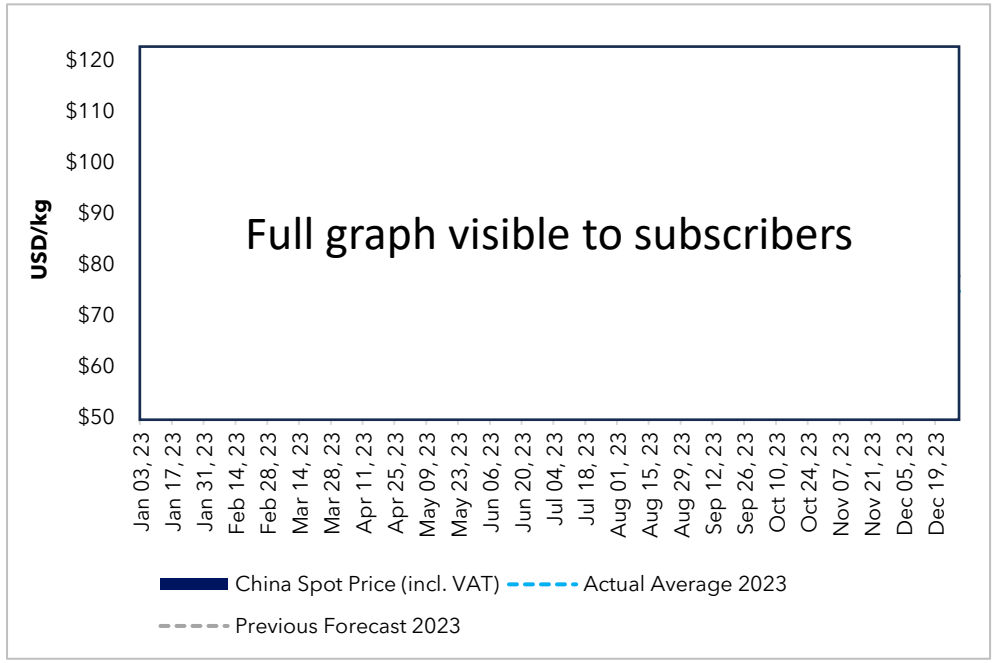
NdPr oxide

Actual price X.X% lower than forecasted for 2023

Actual average price of $XX.XX/kg in 2023



Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

In Q1 2023, the China spot price of NdPr oxide (incl. VAT) averaged $XX.XX/kg.

In Q2 2023, the average fell to $XX.XX/kg.

In Q3 2023, the average price fell to $XX.XX/kg.

In Q4 2023, the average price rose to $XX.XX/kg.

Overall, the price of NdPr oxide averaged $XX.XX/kg in 2023, X.X% lower than previously forecasted.

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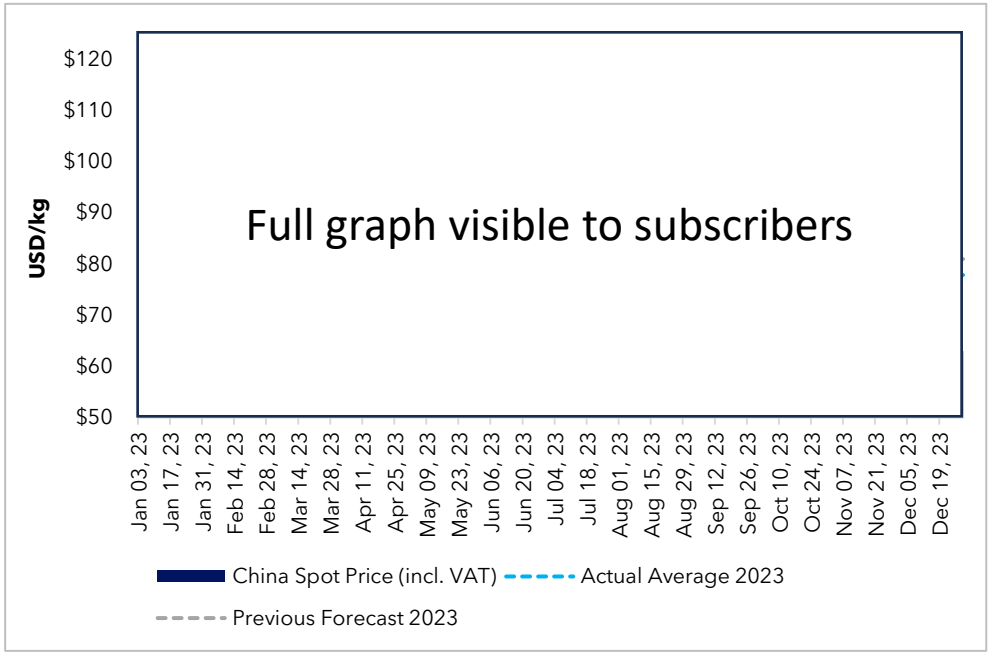
Nd oxide

Actual price X.X% lower than forecasted for 2023

Actual average price of $XX.XX/kg in 2023



Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

In Q1 2023, the China spot price of Nd oxide (incl. VAT) averaged $XXX.XX/kg.

In Q2 2023, the average fell to $XX.XX/kg.

In Q3 2023, the average price fell to $XX.XX/kg.

In Q4 2023, the average price rose to $XX.XX/kg.

Overall, the price of Nd oxide averaged $XX.XX/kg in 2023, X.X% lower than previously forecasted.

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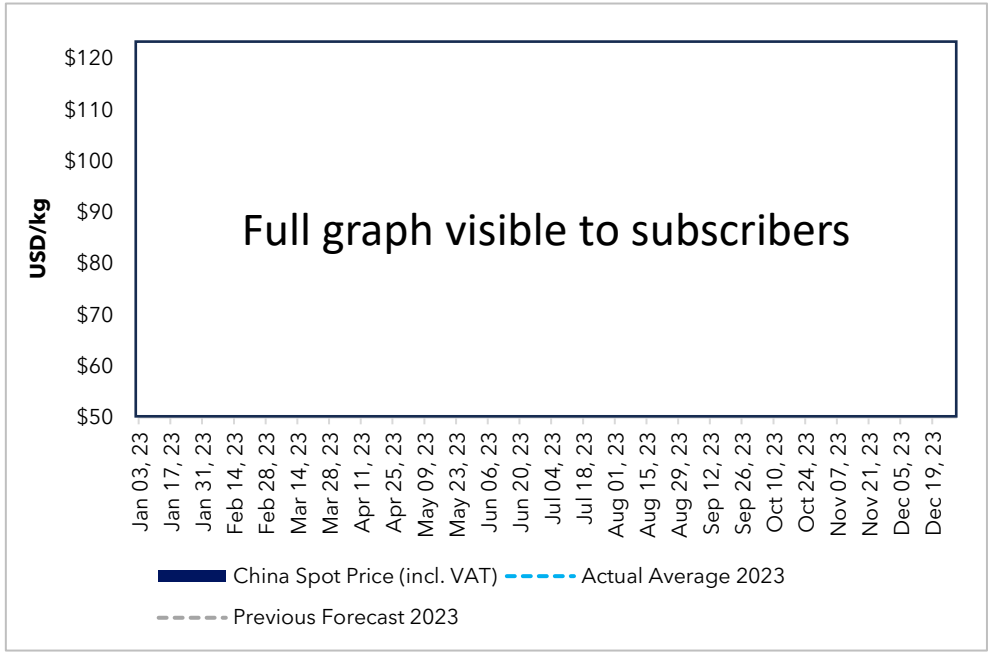
Pr oxide

Actual price X.X% lower than forecasted for 2023

Actual average price of $XX.XX/kg in 2023



Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

In Q1 2023, the China spot price of Pr oxide (incl. VAT) averaged $XX.XX/kg.

In Q2 2023, the average fell to $XX.XX/kg.

In Q3 2023, the average price fell to $XX.XX/kg.

In Q4 2023, the average price rose to $XX.XX/kg.

Overall, the price of Pr oxide averaged $XX.XX/kg in 2023, X.X% lower than previously forecasted.

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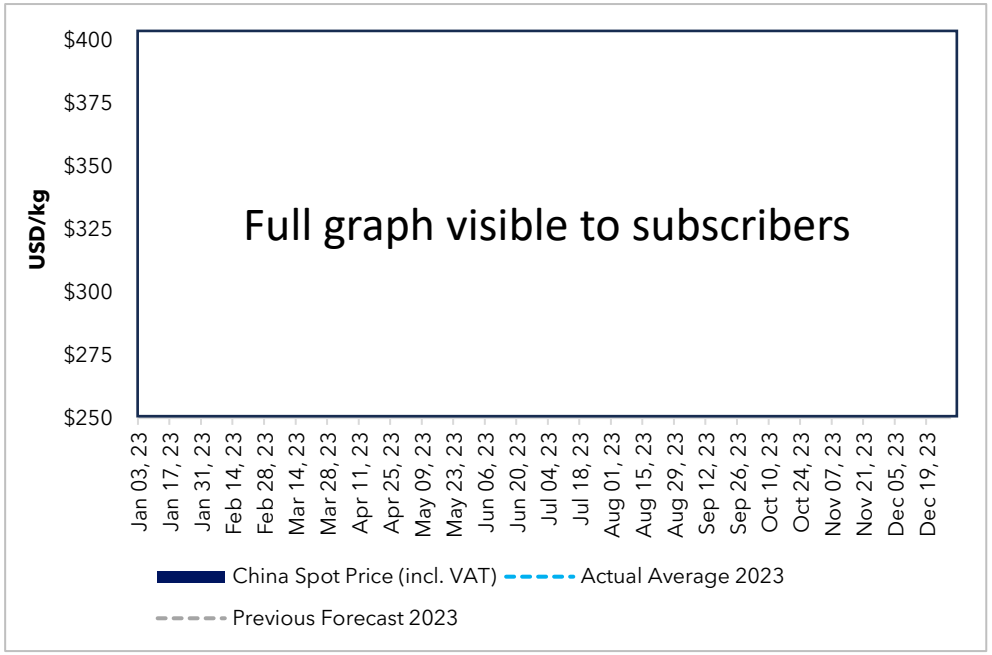
Dy oxide

Actual price X.X% lower than forecasted for 2023

Actual average price of $XXX.XX/kg in 2023



Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

In Q1 2023, the China spot price of Dy oxide (incl. VAT) averaged $XXX.XX/kg.

In Q2 2023, the average fell to $XXX.XX/kg.

In Q3 2023, the average price rose to $XXX.XX/kg.

In Q4 2023, the average price rose to $XXX.XX/kg.

Overall, the price of Dy oxide averaged $XXX.XX/kg in 2023, X.X% lower than previously forecasted.

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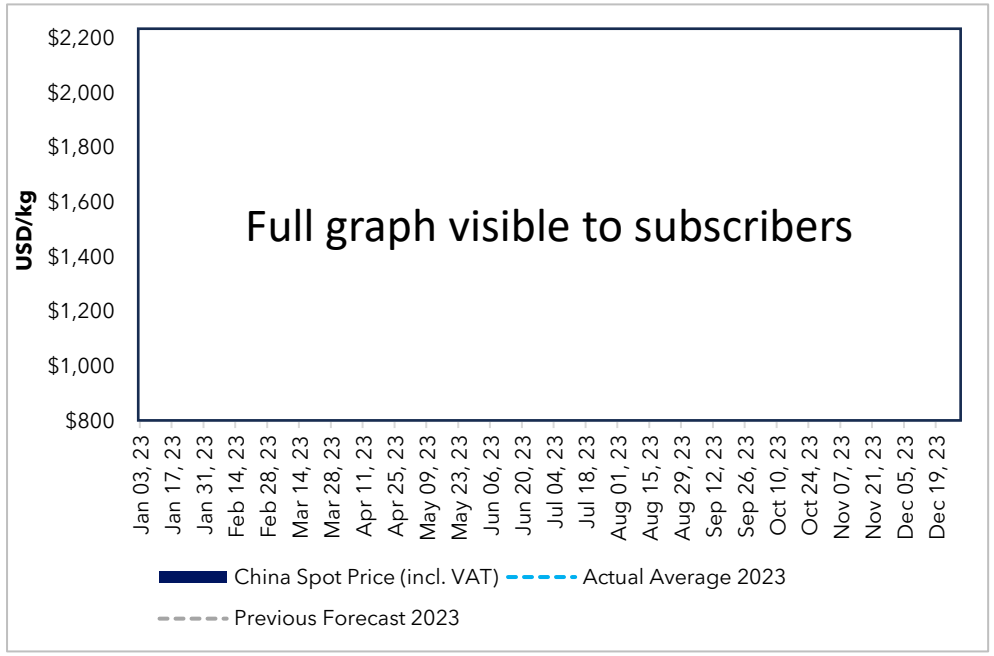
Tb oxide

Actual price X.X% lower than forecasted for 2023

Actual average price of $X,XXX.XX/kg in 2023



Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

In Q1 2023, the China spot price of Tb oxide (incl. VAT) averaged $X,XXX.XX/kg.

In Q2 2023, the average fell to $X,XXX.XX/kg.

In Q3 2023, the average price fell to $X,XXX.XX/kg.

In Q4 2023, the average price rose to $X,XXX.XX/kg.

Overall, the price of Tb oxide averaged $X,XXX.XX/kg in 2023, X.X% lower than previously forecasted.

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C. Summary of Actual vs. Forecasted Prices

2023

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Actual vs. Forecasted Prices in 2023

Summary

Oxide	Q1 Avg.	Q2 Avg.	Q3 Avg.	Q4 Avg.	Actual 2023 Avg.	YTD In/Decrease %	Previous Forecast for 2023	Actual vs. Forecast for 2023
La2O3 (3N)	Full data visible to subscribers							
CeO2 (3N)								
Pr6O11 (2N5)								
Nd2O3 (2N5)								
NdPr Oxide (2N5)								
Sm2O3 (3N)								
Eu2O3 (5N)								
Gd2O3 (2N5)								
Tb4O7 (4N)								
Dy2O3 (2N5)								
Ho2O3 (2N5)								
Er2O3 (2N5)								
Yb2O3 (4N)								
Lu2O3 (4N)								
Y2O3 (5N)								
Sc2O3 (4N)								

Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB)

As with the magnet rare earth oxides, prices of most other rare earth oxides increased just modestly in Q4 2023, or even decreased slightly, dragging most actual average prices for 2023 below previously forecasted levels for the year.

Overall, from the first day of the year through the last, gadolinium and holmium oxide saw the greatest drop in price levels, falling XX.X% and XX.X%, respectively.

Other rare earths that experienced a significant drop in price level throughout last year include terbium, neodymium, didymium, praseodymium, lanthanum, cerium, samarium and yttrium oxide.

Conversely, throughout the 2023 calendar year, the price of dysprosium oxide increased overall, rising X.X% from the first day of the year to the last day of the fourth quarter.

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D. Summary of Price Forecast Updates

Base Case

Base Case Price Forecast Updates in Q1 2024

Summary - LREOs

Looking forward, we believe that China will continue to suppress rare earth prices in the near-term as 1.) a countermeasure to U.S. and allies' supply restrictions on chipmaking equipment, and 2.) a challenge to supply chain development initiatives abroad.

Among the light rare earth oxide suite, we have adjusted down our near-term forecasted prices for all REOs as of Q1 2024.

Moreover, we have adjusted down our medium- and/or long-term prices for NdPr, Nd, Pr and Gd oxides as of Q1 2024.

LREO	2021a	2022a	2023a	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
La2O3 (3N)																				
in/decrease (%)																				
CeO2 (3N)																				
in/decrease (%)																				
Pr6O11 (2N5)																				
in/decrease (%)																				
Nd2O3 (2N5)																				
in/decrease (%)																				
NdPr Oxide (2N5)																				
in/decrease (%)																				
Sm2O3 (3N)																				
in/decrease (%)																				
Eu2O3 (5N)																				
in/decrease (%)																				
Gd2O3 (2N5)																				
in/decrease (%)																				

Full data visible to subscribers

Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB); Forecasted prices in Real 2024 dollars; In/decrease is relative to previous price forecast for that year.

Base Case Price Forecast Updates in Q1 2024

Summary - HREOs

As noted on the previous page, we believe that China will continue to suppress rare earth prices in the near-term as 1.) a countermeasure to U.S. and allies' supply restrictions on chipmaking equipment, and 2.) a challenge to supply chain development initiatives abroad.

Among the heavy rare earth oxide suite, we have adjusted down our near-term forecasted prices for Ho, Er, Yb, Lu, Y and Sc oxides as of Q1 2024.

Moreover, we have also adjusted down our medium- and/or long-term price expectations for Ho, Yb, Y and Sc oxides as of Q1 2024.

LREO	2021a	2022a	2023a	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Tb4O7 (4N)																				
in/decrease (%)																				
Dy2O3 (2N5)																				
in/decrease (%)																				
Ho2O3 (2N5)																				
in/decrease (%)																				
Er2O3 (2N5)																				
in/decrease (%)																				
Yb2O3 (4N)																				
in/decrease (%)																				
Lu2O3 (4N)																				
in/decrease (%)																				
Y2O3 (5N)																				
in/decrease (%)																				
Sc2O3																				
in/decrease (%)																				

Full data visible to subscribers

Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB); Forecasted prices in Real 2024 dollars; In/decrease is relative to previous price forecast for that year.

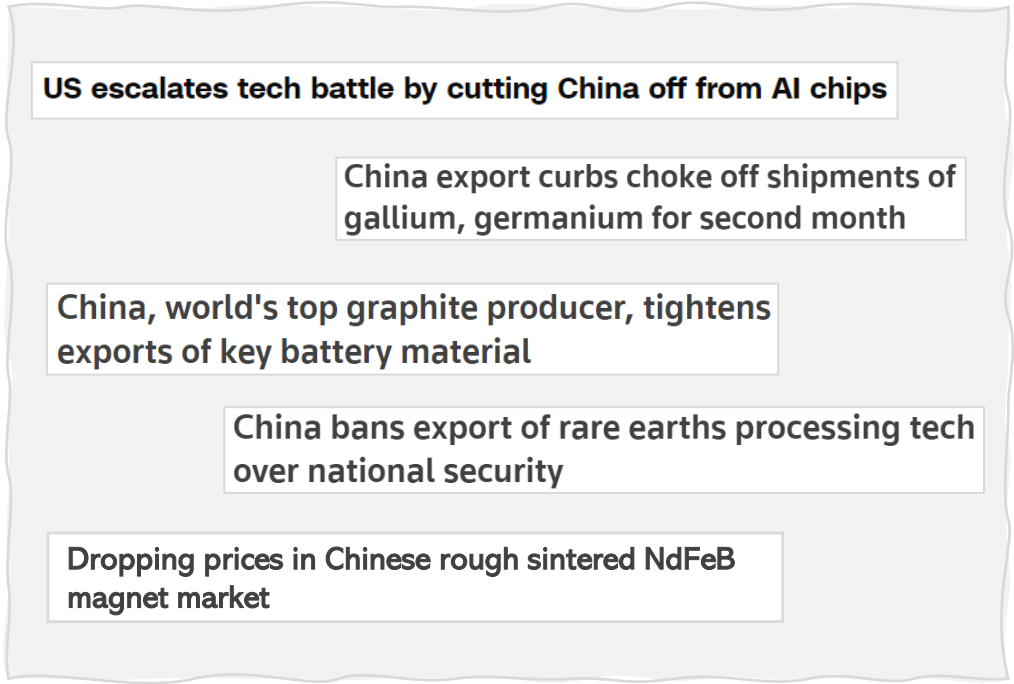
E. Forward Looking

Catalysts

Trade wars

U.S. – China trade war enters the critical materials arena

Wider export restrictions becoming more plausible



Source: Mainstream media

In 2023, the U.S. – China trade war has entered the critical materials arena. Throughout the year, the U.S. enlisted its allies in Europe and Asia to restrict sales of advanced chipmaking equipment to China.

In July, China retaliated by imposing restrictions on exports of gallium and germanium – two critical chipmaking metals that it dominates supply of. Furthermore, in October, China announced restrictions on exports of graphite – a critical material used in Li-ion battery anodes.

Moreover, in December, China announced restrictions on exports of rare earth processing and magnet making technology. And most recently, major producers and traders in China slashed prices in a bid, we believe, to challenge foreign supply chain ambitions.

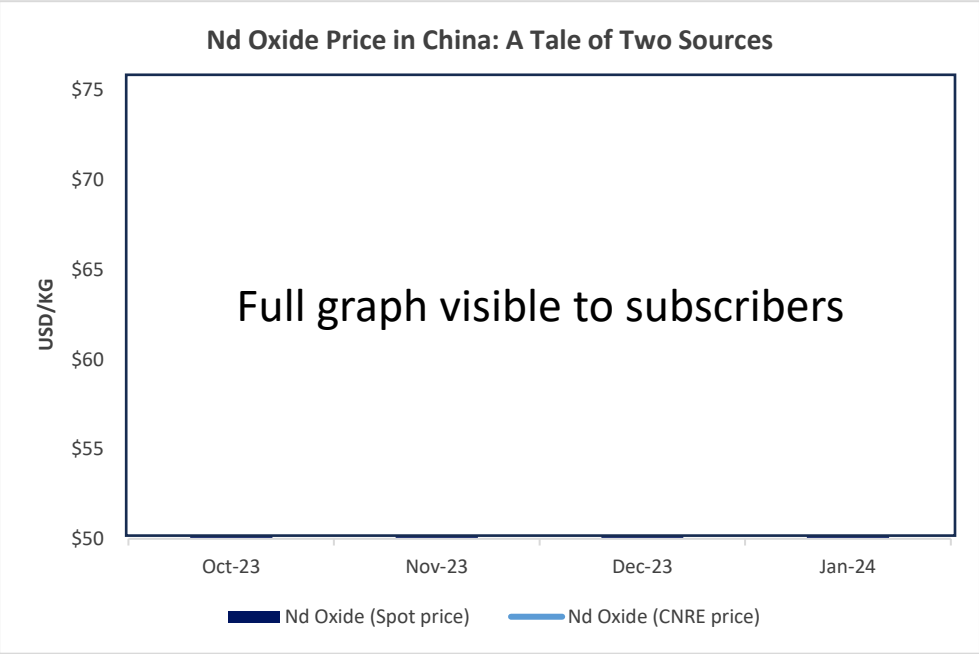
Implications: The ongoing tit-for-tat has escalated to the point that wider restrictions on physical exports of critical materials, possibly rare earths, are becoming more plausible. This could guide prices towards levels expected in our Upside Scenario.

Adamas Intelligence

China Northern Rare Earth Group prices

Will February see CNRE prices increase?

If so, will the spot market follow?



In late-2023, China's MIIT and MLR issued a third batch of rare earth production quotas, the majority of which went to China Northern Rare Earth Group ("CNRE"). In response, CNRE slashed its Nd and NdPr guidance prices by X% to X% in January 2024, leading spot prices of the same material to spiral lower in a race to the bottom.

However, days after dropping its prices, CNRE signed a new concentrate offtake agreement with its supplier, Baotou Steel Union, that will result in its feedstock prices rising in Q1 2024. This has led some traders, analysts and market participants in China to speculate that rare earth prices, especially spot prices, may rebound in the weeks ahead.

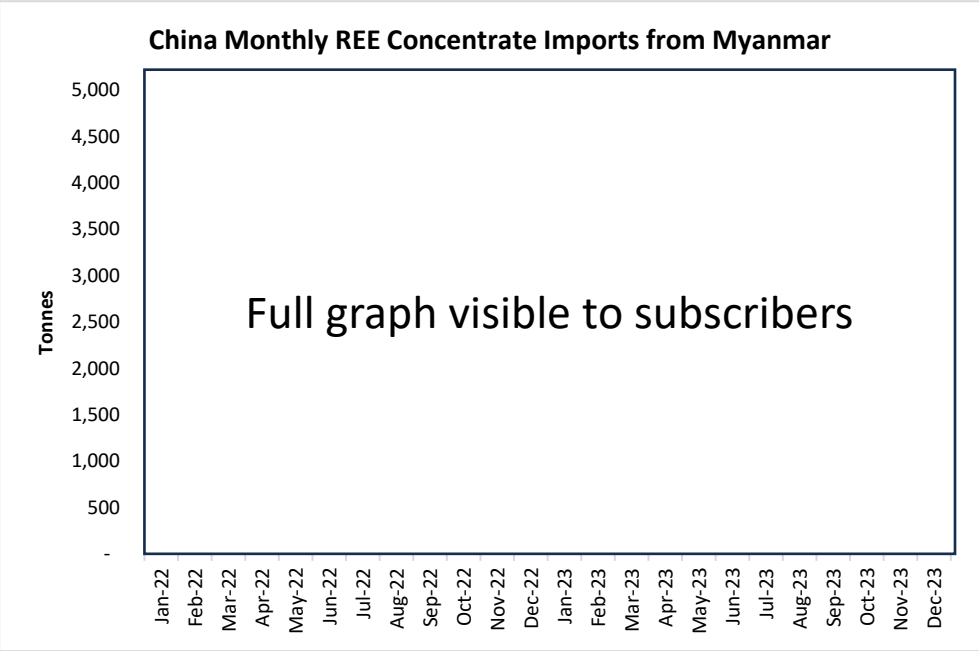
Implications: In general, spot prices tend to closely follow CNRE guidance prices. At present, there exists a wide disparity between the two price sources suggesting reconvergence is imminent. CNRE's February guidance prices will be telling. If up, we expect spot prices to rebound, if down we expect spot prices to hold, guiding prices towards our Downside Scenario in the near-term.

Adamas Intelligence

Myanmar uncertainty

Four key border crossings with China closed in December

Expected disruption in December exports, extent unknown



As noted earlier, in Q4 2023, the military conflict in Myanmar escalated to levels not see since the 2021 coup began.

By November month-end, resistance forces in the nation had seized four key border crossings with China.

Consequently, rare earth exports to China were expected to be disrupted in December but have likely resumed in January following China's negotiation of a ceasefire earlier this year.

Implications: In the near-term, a December lull in supplies from Myanmar is largely immaterial given currently weak demand in China coupled with offsetting supplies from other regions such as Laos and Malaysia.

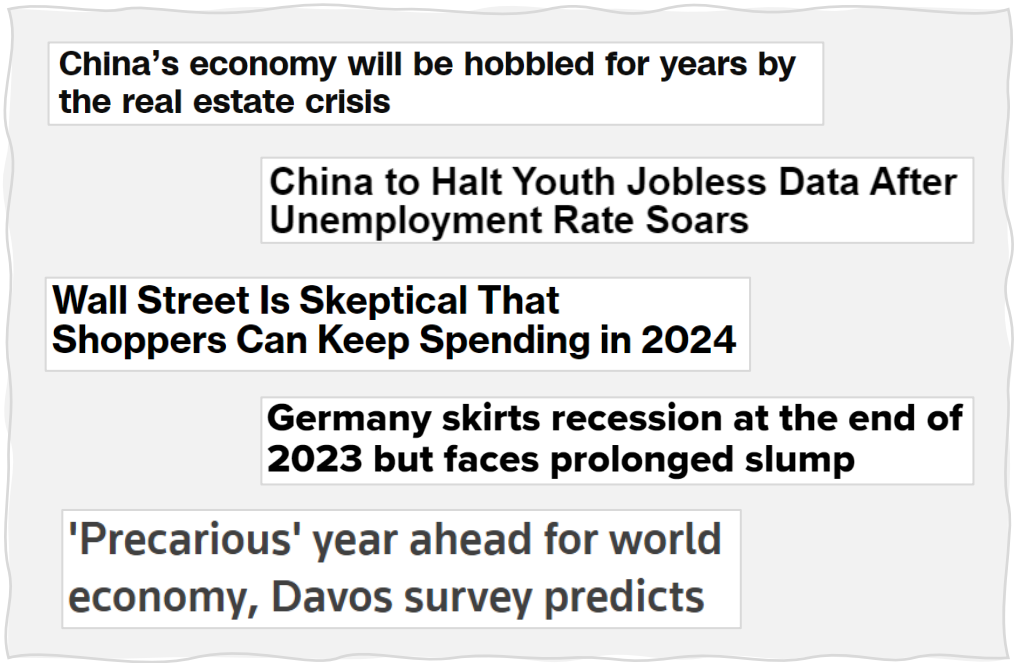
However, the latest disruption serves as yet another example of the instability that Myanmar presents. With upwards of XX% of global Dy and Tb mine supply coming from Myanmar each year, a prolonged disruption of supplies from the nation into China could guide prices towards levels projected in our Upside Scenario.

Adamas Intelligence

Consumer confidence

Key bellwether for 2024 market performance

High interest rates, rising unemployment rates and other economic headwinds present material risks in 2024



Source: Mainstream media

High interest rates, rising unemployment rates and other economic headwinds present material risks in 2024.

Implications: The easing of inflation, interest rates, unemployment and/or other economic headwinds in 2024 could help bolster consumer confidence and spending, while guiding prices towards levels projected in our Upside Scenario.

Conversely, the worsening of inflation, interest rates, unemployment and/or other economic headwinds in 2024 could suppress demand for rare earths, guiding prices towards levels projected in our Downside Scenario.

Adamas Intelligence

F. Forward Looking

Appendices

Upside price forecast scenario

Summary

REO	2021a	2022a	2023a	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
La2O3 (3N)	Full data visible to subscribers																			
in/decrease (%)																				
CeO2 (3N)																				
in/decrease (%)																				
Pr6O11 (2N5)																				
in/decrease (%)																				
Nd2O3 (2N5)																				
in/decrease (%)																				
NdPr Oxide (2N5)																				
in/decrease (%)																				
Sm2O3 (3N)																				
in/decrease (%)																				
Eu2O3 (5N)																				
in/decrease (%)																				
Gd2O3 (2N5)																				
in/decrease (%)																				
Tb4O7 (4N)																				
in/decrease (%)																				
Dy2O3 (2N5)																				
in/decrease (%)																				
Ho2O3 (2N5)																				
in/decrease (%)																				
Er2O3 (2N5)																				
in/decrease (%)																				
Yb2O3 (4N)																				
in/decrease (%)																				
Lu2O3 (4N)																				
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Y2O3 (5N)																				
in/decrease (%)																				
Sc2O3																				
in/decrease (%)																				

Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB); Forecasted prices in Real 2024 dollars; In/decrease is relative to previous price forecast for that year.

Downside price forecast scenario

Summary

REO	2021a	2022a	2023a	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
La2O3 (3N)	Full data visible to subscribers																			
in/decrease (%)																				
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Gd2O3 (2N5)																				
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Notes: Prices reflective of China domestic (EXW, incl. VAT) and China export (FOB); Forecasted prices in Real 2024 dollars; In/decrease is relative to previous price forecast for that year.

About Adamas Intelligence

- Founded in 2012 to help clients make informed decisions involving critical metals and materials
- Clients on 6 continents including exploration and mining companies, institutional investors, technology and material developers, government agencies and other advisory firms
- In 2022, our industry leading research and advice guided over $1 billion of investment commitments
- Reputation for rigor, transparency and delivering actionable insights
- **The original critical minerals and metals research company**